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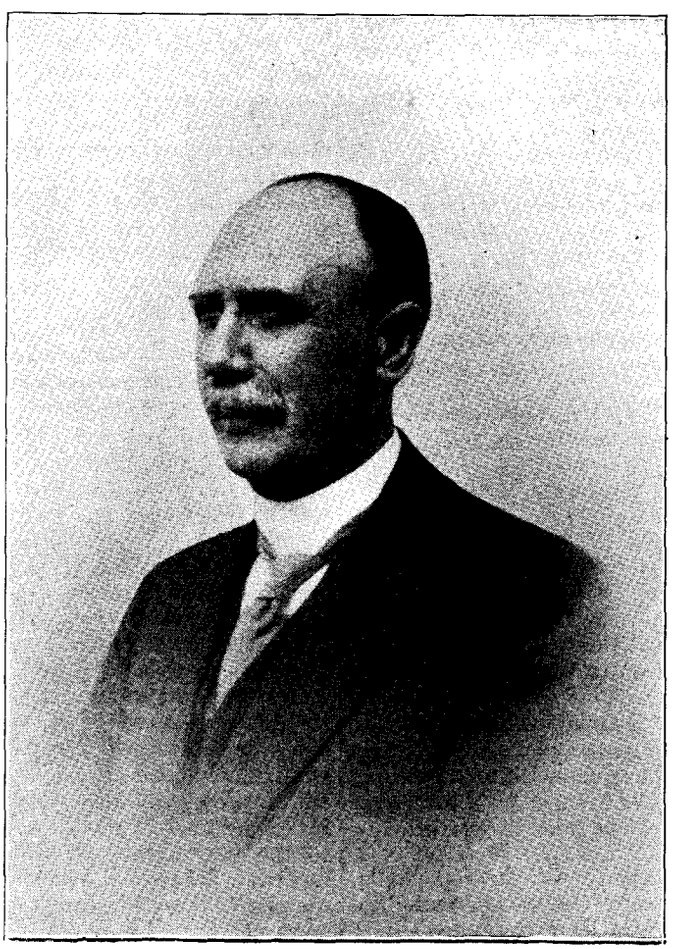
TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LVII.

MR. W. E. GAUNTLETT.



MR. W. E. GAUNTLETT, the present District Manager of Telephones in Liverpool, began his career as a telephone man in April, 1887, when he entered the service of the Western Counties & South Wales Telephone Co., at Gloucester, as a learner. No telephone exchange yet existed in that town, nor in any other town in the whole district lying between Bristol and Birmingham. Mr. Gauntlett acquitted himself so well that in 1892 he was appointed Local Manager at Gloucester. In 1896 (the Western Co. having by this time been merged in the National Telephone Company) he became Local Manager at Bristol and took part in the conversion of the Bristol system from overhead to underground and from magneto to common battery working. Bristol, it may be observed, was the first town in England to be converted to the C.B. system. On July 1, 1900, he was promoted to the post of District Manager in the newly formed Gloucester District. The year 1906 saw him District Manager in the more troubled atmosphere of Swansea, where a lively competition with the short-lived municipal telephone system was raging. In 1917 he returned to Gloucester again, but in 1926 after having spent so far all his telephone days in the West Country, he began a period of nearly five years' District Managership in Western Scotland. In August, 1926, his solid merits procured him the important post of District Manager for Liverpool, which district, as our readers know, comprises S.W. Lancashire and most of the Wirral peninsula, and is, as regards the number of telephones it comprises, the third largest provincial district. Mr. Gauntlett has probably been concerned in the opening of as many or more telephone exchanges than any other existing District Manager. He is conspicuously successful in maintaining good relations with public bodies, and his tact in this connexion has often stood the Post Office in good stead.

INEFFECTIVE CALLS.

(RECOVERING THE WASTE.)

BY A. E. HIGGENS, ASST. TRAFFIC SUPT., GLASGOW.

INEFFECTIVE calls, like the poor, will always be with us. It is obviously impossible to ensure that at no time will two different subscribers simultaneously desire to speak to a third, and that no one will call a house or office which happens to be temporarily untenanted. There are, however, a large number of ineffective calls which are not unavoidable, and which can be ascribed to shortcomings of one sort or another on the part of the telephone staff, apparatus or subscribers.

Now as regards the first two of these factors, no stone is left unturned to see that the staff is adequate to deal with the traffic, thoroughly trained, and understands the apparatus—and subscribers —as far as is humanly possible, and that the apparatus is sufficient and maintained in good working order. But what of the third element in the case, the great British Public ?

The proportion of ineffective work which could be eliminated by the Department alone is comparatively small, and most of this is due either to sheer misfortune or to the fallibility of the human element.

It is clear, then, that any substantial reduction in waste work can only be achieved with the full co-operation of the public. Is enough being done to secure this co-operation ? Or, perhaps it would be more pertinent to enquire : Are we setting about it in the right way ? It will be readily admitted that subscribers do not co-operate with the Department as they might. And why ? Is it not because they have a very garbled idea of the Telephone Service and all that it involves ? It is not too much to say that the average subscriber regards the service as something provided for his own special benefit, administered, grudgingly, by a set of semi-human automata with a few stereotyped phrases, who require compliance with certain rules (and payment of certain sums) without even deigning to explain the reason. He remains in blissful(?) ignorance of the fact that the rendering of an efficient service depends on him no less than on the Post Office. Now the average Britisher is not averse from lending a helping hand if he knows what he is being asked to do and why he should do it. He is apt to object, however, to being ordered, soldier-like, to do apparently objectless things without knowing the reason.

What, then, can be done to dissipate this fog of misapprehension and misunderstanding, and to give the subscriber an insight into the part *he* is playing in the telephone service ? Is it not high time that official rigidity was relaxed somewhat, and that the Department came off its perch and took the public into its confidence?

In Glasgow last winter lectures on the Telephone Service, with practical demonstrations on a model switchboard, were given to a number of societies. These proved somewhat of an eye-opener to the four thousand people who were reached by this purely voluntary effort, and have undoubtedly led to a better understanding of what is involved in the everyday telephone call. But what is 4,000 among the users of upwards of 50,000 telephones in the area ? And how long would it take to cover the whole country by this method ? If the public are to be educated into the proper use of the telephone the problem must be tackled on a far larger scale. Some systematic propaganda work is what is needed.

Let us consider what channels are open for such propaganda. These include (*a*) the Press, (*b*) public lectures and (*c*) the periodical communications sent to subscribers by the Department.

(*a*) The Press.—Here we have a vast field of opportunity practically unexplored. I do not for one moment suggest that we should lower ourselves to reply to the petty spite or alleged humour of the anonymous letter. But far too often is reasoned criticism, which would not arise were the facts of the case known, allowed to pass unchallenged, with the result that the public are left with a still more deeply rooted impression of official " obduracy " and " hopelessness," when a statement of the other side of the case from the pen of some responsible officer would have cleared away misunderstanding. If instead of the virtual interdict on journalism, contributions to the public Press (approved by responsible authority before being submitted for publication) were encouraged, much might be done to stimulate intelligent interest in the service on the part of the public and so lead to a more efficient use of the telephone.

The same remarks apply to the newest publicity medium—broadcasting. It is surely ironical that one department of the Post Office cannot do something to help another.

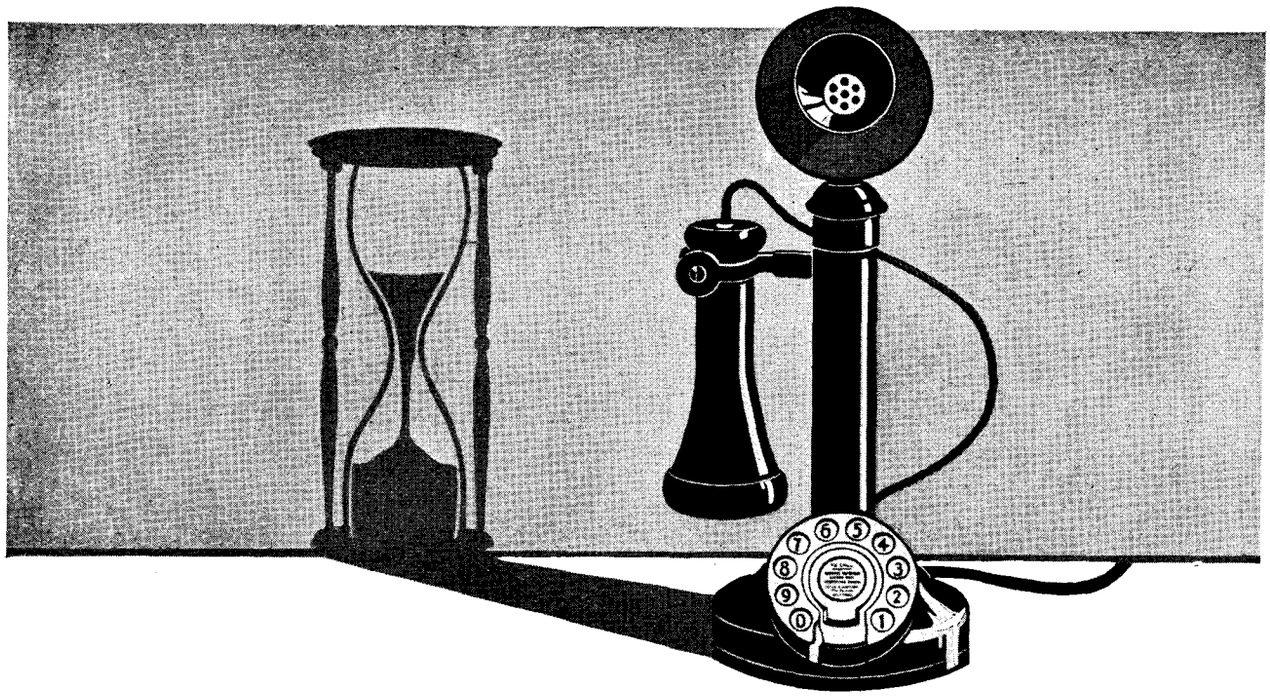
(*b*) The Lecture.—This is undoubtedly the method of getting into the most intimate contact with the public, of meeting their point of view with ours and of enlightening them as to the reason why things should be done. On the other hand, it entails a vast amount of work and preparation on the part of the lecturer, while the number reached is comparatively small in relation to the effort involved.

(*c*) There remain the communications sent by the Department to subscribers. Chief among these are accounts and directories. Now perhaps it is not exactly tactful to couple education with demands for money, though I believe it is the practice in some quarters to send with the accounts leaflets setting forth the inestimable benefits of extension telephones, so perhaps a few practical hints on how to get the best out of the service might not come amiss.

And what of the Directory ? Some doubtless excellent suggestions are embodied in the preface to this document. But who reads prefaces—leaving out of consideration the fact that the telephone directory is a book to be referred to as occasion demands, not a literary masterpiece to be studied from cover to cover ? The exact practical value of this preface can be gauged from the fact that practically 100% of one's calls to the public are answered by that irritating, meaningless, time-wasting " Hal-l-lo," leaving one to enquire whether the correct number has been obtained.

But why confine the hints to the preface ? Why not devote a line or two of advertising space on each page to some short, eye-attracting slogan such as " Unnecessary remarks mean engaged numbers," or " Insufficient lines mean lost calls. Lost calls mean lost business." A few pointed hints like these put one on each page of the directory in a position where it would be seen, would gradually sink in and slowly but surely produce a response. What should be avoided is the stiff, formal, unexplained request.

Apart from the overloading of lines and the general time-wasting which amounts to the same thing, perhaps the greatest source of waste work is the private branch exchange. Here, again, difficulties are largely due to lack of knowledge of what is involved. In some cases the operator does not know how to manipulate the board, giving rise to cut offs, double connexions, " L.G.'s " and the like. But where the manipulation is fully understood the operator is often the unwitting cause of lost calls and other waste work. For example, perhaps the operator is engaged on one line with a person who does not know what he wants, when a call comes in on another. She finishes the conversation before attending to the second call, on which " No reply " has meanwhile been reported. The caller, knowing there must be someone in attendance, disbelieves this and lodges a complaint, thus adding more unnecessary work to that of the lost call. Or else the second call is plugged



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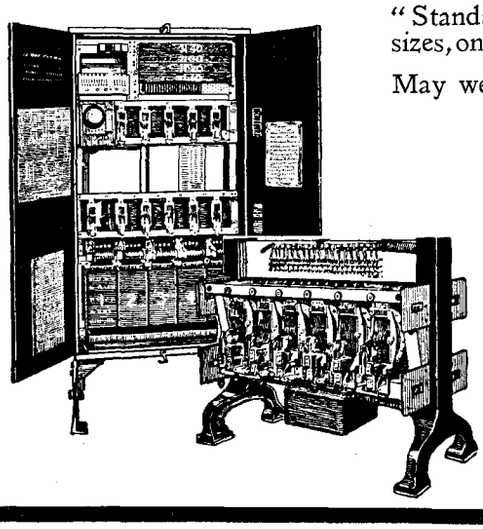

"Standard" Automatic Telephone Systems are supplied in two sizes, one with a maximum of 70 lines, the other with a limit of 21.

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Works - - North Woolwich, Hendon, New Southgate.

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out, giving a signal at the exchange to the effect that the call has been answered. Hence there is no supervision, and the caller either complains of delay and inattention, or abandons the call, which is recorded as effective. All private branch exchange operators should be thoroughly instructed, not only in the details of manipulation but also as to their responsibilities in connexion with calls, particularly as to the need for answering incoming calls (at the expense of interrupting any conversation in which she may be detained) and for clearing, as quickly as possible. It is not sufficiently realised by the renters of private branch exchanges that the working of these installations can do much to make or mar an efficient telephone service, and that it is their duty to see that they are properly attended by trained operators.

In short, it is my confirmed opinion that the chief hope for a substantial reduction in inefficiency lies in the education of the public to play their part in the working of the service. It is of little use repeatedly telling people what you want them to do. They may remember to do it, or they may not. But take them into your confidence, give them credit for a little intelligence, tell them why they should do it, make them realise that they can help you to help them, and they are far more likely to respond.

The rigid official attitude may be the only possible one to adopt in some cases, but it certainly seems that it might be relaxed with advantage now and again, especially in a case like this where there exist so much misunderstanding and so many erroneous ideas which might be removed, and whose removal cannot but lead to a more intelligent and, *ipso facto*, more efficient, use of the service.

PERSONALITY AND THE CALLING RATE.

By R. S. GROSVENOR, Gloucester.

THERE are many good reasons that can be advanced for the general decrease in the calling rate, from trade depression and the consistently increasing popularity of the motor-car, to the mentality of the person who refrains, as far as possible, from using the telephone because his grandfather managed without.

Comparing the January 1928 Operating Statistics with those taken in January, 1927, the drop in the general calling rate by 3.5% is accounted for to the extent of 50% by the increase in residential lines and transfers from magneto to automatic working, and the other 50% by a general drop in the calling rate, greatly influenced, as it is supposed, by trade depression.

Our business, however, is to endeavour by every means in our power to turn the decrease in the calling rate into a consistent increase. It is a problem to be solved, something to achieve, and surely worthy of a big effort on the part of all telephone women and men. It will be observed the ladies are placed first in this case, not only as a matter of etiquette, but for a reason which will be abundantly clear. The problem can be effectively dealt with in the exchanges in addition to public propaganda.

What can we do about it ? The great thing appears to be to sell our inexhaustible stock of calls in a more attractive manner.

A good average speed of answer in operating is essential, but after all that is only the commencement of a satisfactory service. It is equally necessary to see that the calling party is as satisfied on the completion of a call as at the commencement, but even that is not sufficient. To increase the calling rate, users of the telephone should be *encouraged* in every possible way to use it again, make a habit of it, and to quote the now somewhat worn slogan "Say it by Telephone."

The telephone is an essential factor in the life of the community and it is our business to see that this fact is much more fully recognised.

The Contract Officer eloquently explains the necessity for and advantages of the service. The order is obtained, and when connected the subscriber should be at once encouraged to forget his natural inclination to conserve calls by giving him such a completely satisfactory service that more and more calls than were ever intended are made. A most important feature, especially on the operating side is, undoubtedly, *personality*. It is not easy to introduce this for we are handicapped. Our customers do not come into a carefully prepared atmosphere, meet a very obliging shopwalker and are passed on to an equally obliging assistant. No ! our customers are in their own offices or homes or call offices very often full of business, or worried and requiring urgent attention. They cannot (at present) see what is going on and have little or no idea how many customers are waiting to be served with equally important calls at exactly the same time.

The rising inflection, the courteous and confident manner, the complete supervision of the call, the ability not only to please but inspire confidence is, generally speaking, within the power of every telephone operator. Can we not treat every calling party in a more personal manner, *sell the call*, and sell it in such a way that users will be encouraged and, in fact, drawn to the telephone.

An operator's life is not a bed of roses, but nothing really worth while is easy to achieve and, after all, telephone people have their hearts in their work. There is no doubt it will be generally agreed that a more personal touch will do much to stimulate the calling rate.

It is quite recognised that it is one thing to write an article and another to operate at a busy switch section, but the ideal really aimed at will have every chance of success. Experience has proved that telephone operators can always nobly rise to an occasion.

Every telephone operator is a saleswoman or salesman and the success of the business is in their hands. To deal with telephone users in such a way as to encourage and increase business is our plain duty. The point of view is all-important. If this is right, the essential personal element will be there and, in consequence, users will come along with calls in ever increasing numbers.

With automatic systems now steadily spreading over the country, it is more than ever necessary to see that the personal touch is maintained in operating. This sounds paradoxical, but it really is not. The calls dealt with at a manual board used in connexion with an automatic system are the more expensive calls, and if sold to users in an attractive manner cannot help but encourage the more general use of that system. The majority of the calls, however, will be completed automatically, the caller being his own operator. Here in the case of assistance traffic, the personality of the manual operator is of extreme importance.

Personality in operating and the calling rate are even more closely associated than the shopkeeper and the customer. If the personal element is lacking, say, in a shop or even in a Post Office, a member of the public has an alternative, and can go elsewhere, but he cannot, by taking thought, change his telephone exchange.

In the case of exchanges serving residential neighbourhoods where a large proportion of users are leisured people, an impression of confidence, an impression that we are seeking their custom, and are anxious to serve them by showing a real personal interest in their requirements will go a long way to achieve the desired end.

A strong combined effort on these lines and the calling rate should soon be showing improvement. Optimism—certainly ! With an operating force such as possessed by the department, and the more intensive cultivation of "the voice with a smile," the calling rate can be stimulated.

TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—Mr. H. P. Brown, Director of Posts and Telegraphs, on his return a few weeks ago from a tour in Europe and America, stated in an interview with a representative of Reuter's Agency, that he was anxious to introduce regular wireless telephony between Great Britain and Australia.

The business communities were, he said, reaching out for the new facility, but an early difficulty would be the synchronisation of the times, as only two or three business hours out of the twenty-four coincided. Mr. Brown added that all the new developments of wireless telephony and television would be introduced into Australia within a reasonable time.

About a week later the Canberra correspondent of the *Daily Telegraph*, London, cabled that Mr. Brown forecasts considerable advances in broadcasting, as well as in telephonic communication in Australia. He declares that the establishment of relay stations in country centres is imperative. "Australia," he says, "has a modern system of telephone trunk lines, which can be used to transmit from the capital cities programmes from main broadcasting stations.

"Sir John Reith placed the results of the British Broadcasting Corporation's investigations at the disposal of Australia to enable us to benefit by the experiments in Britain." He also added, "I feel strongly that the proposals of the Imperial Wireless and Cable Conference are sound, and if adopted and developed in the proper spirit they will re-establish the predominance of British communications."

From Ballarat we learn that "the Postmaster-General's department has asked the Dominion Broadcasting Co., Melbourne, to arrange for the establishment of a relay broadcasting station at Ballarat. A telephone circuit is now available for transmission of the programmes." And from Canberra, through Reuter, we are given to understand, Mr. Bruce has announced that the Government does not intend constructing a high-power wireless station at Canberra, as advocated by high military officers as a war precautionary measure. Mr. Bruce, we are given to understand, replied in terms which practically meant, the situation does not arise!

Victoria.—The *Electrical Engineer of Australia and New Zealand* reports that for the first time since wireless broadcasting became a national entertainment in Australia there has been a decrease in the number of listeners' licences in Victoria. Returns for the month of May show that the number of licences which were not renewed in that State was over 200 in excess of the new licences issued during the month. In all the States except Victoria and West Australia the excess of new licences over cancellations was maintained last month. The total number of licences in force in Victoria is now 136,496, and the number throughout the Commonwealth is 267,178.

New South Wales.—The New South Wales Broadcasting Co., Ltd., has been formed in Sydney, with authorised capital of £100,000, for the purpose of taking over and operating the "A" class broadcasting stations now controlled by Farmer's (2FC), Ltd., and Broadcasters (Sydney), Ltd., (station 2BL). Some of the directors are associated with the Dominion Broadcasting Co. Pty., Ltd., which recently took over the "A" class stations in Melbourne. The Sydney stations, like those in Melbourne, will retain their individuality, but the programmes will be so arranged as to avoid duplication.

The following three paragraphs are excerpted from an Australian letter to the London *Electrician* :—

"In the wireless world, the principal topic of conversation last month was the expressed intention of the Federal Government to assume control of 'A' class broadcasting, calling tenders periodically for the provision of programmes. There are two classes of broadcasting station in Australia. The 'A' class, which receive their revenue out of listeners' licence fees and are not permitted to broadcast advertising matter; and the 'B' class stations, which receive the whole of their revenue from advertising.

"There is much curiosity as to the effect which the announced wireless and cable merger will have upon Australian services, for Australia's wireless services are controlled by Amalgamated Wireless (Australasia), Ltd., formerly a subsidiary of the Marconi interests, but now controlled by the Federal Government, which holds a majority of the shares.

"Australians, by the way, are led to expect that within the next year or two the beam stations of Amalgamated Wireless (Australasia), Ltd., will be giving telephone as well as telegraph communication with the Motherland.

AUSTRIA.—The Vienna correspondent of *The Times* reports that figures just published by the Austrian Broadcasting Company bear witness to the great popularity of the service in Austria. During the past 12 months the number of listeners increased by 45,875, bringing the total number of subscribers to 293,408. The subscription collected by the company is graded according to the income of the head of the household, or the unmarried subscriber, with a minimum fee of 1*s.* 2*d.* per month on monthly earnings below £20 10*s.*, and 3*s.* 6*d.* if above that figure. The biggest licensing fee is paid by dealers in receiving sets or parts domiciled in cities with more than 20,000 inhabitants. Their lowest rate is 11*s.* 8*d.* for one loudspeaker or five head telephones used for the benefit of their customers.

BELGIUM.—Brussels was the focus upon which the whole telegraph world was centred last month when what was practically a huge sub-committee of the first post-war International Telegraph Conference, held in Paris in 1928, met on Sept. 10 in the Belgian capital. The British Post Office delegates were, Mr. F. W. Phillips, Mr. J. Louden and Mr. F. Strong—a strong team—no pun intended!

For the first time in the history of international telegraphy, international commercial interests were represented, although in 1926 in Berlin, private telegraph manufacturers, Creed, Siemens and the Standard Telephone Coy., were permitted to attend, and as in the present case, had no vote.

The International Chamber of Commerce was asked to attend the Congress to represent world users of communications. After careful inquiry the Chamber decided to demand that if the number of letters in code words was reduced by half, the rate should also be reduced by half. The president of the International Chamber was represented by Sir John Sandeman Allen, M.P., as head of the Transport and Communications Group of the International Chamber. The delegation was headed by Mr. Robert E. Olds, former American Under-Secretary of State, the other members of the delegation being Mr. Ed. Dumoulin (Great Britain), Dr. Luschen (Germany), Mr. Odier (Switzerland), and Mr. Henri Story (Belgium).

This was an innovation which should have considerable enlightening influences upon the business world, which speaking from no small personal knowledge has never, as a whole, been able to understand why Anglo-foreign rates should not be decided by Great Britain, always taking as their standard the American transatlantic cable services. Over sixty countries were represented.

As is well known the main subject was that of Code Words. One of the proposals under discussion was to reduce the number of letters allowed in code words from ten, as at present, to five; the rate, however, would only be reduced by 30 or 40%, thus increasing the cost to business men. On the other hand, it was proposed that rates for ordinary telegrams should be reduced.

According to a Reuter telegram from Brussels, Sir John Sandeman Allen, M.P., speaking on behalf of the President of the International Chamber of Commerce, said that the substitution of code words of five letters for the present limit of ten letters was not desired by commercial interests. He declared that it would be unjust to impose a new charge upon international commerce, which already had many burdens to bear. If the length of code words was to be reduced without any corresponding reduction in charges there would be an almost unanimous opposition from the business community.

It is worthy of note that the Brussels gathering resolved to continue the use of French as its official language, but authorised interpreters to furnish explanations if desired.

As I close these notes comes a semi-official note to hand from Brussels to the effect that the proceedings of the Conference were brought to an end on the morning of the 21st ult., the British, French, and German delegates congratulating the Conference on the results achieved.

BOUVET ISLANDS.—There has been a slight flutter in the London Press on the report that a Norwegian wireless station is to be established on Bouvet Island, the cost of which is being defrayed by Consul Lars Christensen. According to *The Times*, the complete apparatus, including buildings and masts, has been ordered and M. Otto Rogne, for the last four years manager of the wireless station at Advent Bay, has been appointed manager of the station, with two assistants. With his assistants and the wireless outfit, he will leave Sandefjord on Oct. 1 in the floating factory *Thorshammer*. Owing to the importance of Antarctic meteorological information, especially to the agriculture of South Africa, America, and Australia, the construction of a permanent wireless station on Bouvet Island is likely to attract general attention. Bouvet, which is a remote island in the Southern Ocean, has recently been claimed by both Great Britain and Norway; no announcement has been made of a settlement of the claims.

The history of the island according to the official records in London is briefly as follows :—

"Discovered in 1739 by M. Bouvet, a French navigator, it was afterwards, in 1812, occupied for one week (!) by an Englishman, Captain Morrison by name, who called it Liverpool Island. Thirteen years afterwards it was sighted by the *Lively* and the *Sprightly*, two British Government boats.

"Two things seem to emerge from the tiny tangle (1) that it is admitted that such a station, reporting regularly on meteorological conditions, would be of special value to agriculture in Australia, South Africa and South America, (2) that in January of the present year 'the British Government granted to a Norwegian firm an exclusive licence to occupy the island.'"

BULGARIA.—The *Board of Trade Journal* states that among the goods which are exempted from the increased duties recently imposed upon goods entering Bulgaria are the following: Dynamos, motors, transformers and parts; telegraph and telephone apparatus, electrical measuring apparatus and heating apparatus; electric cables and wires; materials for electrical installations; and tramway carriages. These will continue to be subject to the duties at the rate of 15 paper levas to the gold leva.

ECUADOR.—From Quito, through Reuter's Trade Agency, we learn that a presidential decree has authorised the erection of a wireless station at the port of Limones and an initial appropriation of 11,760 sucres (1 sucre = 2*s.*) has been passed for its construction. The first wireless station was erected at Guayaquil in 1913, and since then the Marconi Company has constructed a station at Santa Elena Point with a range of over 500 miles. There are radio-telegraph stations at Quito, Guayaquil Port and Esmeraldas, constructed by La Société Française Radio Electrique, of Paris, on the tuned-spark system. The stations at Quito and Guayaquil are of 10 kw. with antennas of 100 metres.

and that at Esmeraldas is at present 5 kw. with an antenna of 50 metres; at both the umbrella type has been adopted. It is proposed to increase the wireless stations in Ecuador to 12, including one for inter-continental service.

GERMANY.—It is reported in the British daily Press that the German Post Office has bought up the entire German rights of the new television apparatus of the Hungarian inventor Denes De Mihaly, with the intention of giving a television service to holders of radio receiving licences. If the report proves to be correct it will be the first instance of a European Government officially adopting television as an adjunct to radio-telephony.

The British Broadcasting Corporation, London, announces that the Council and the various committees of the International Union of Radiophony, which, at the invitation of the Reichs-Rundfunk Gesellschaft (German Broadcasting Company), met in Berlin on Aug. 31 last, concluded their work on Sept. 5. The Council recognised that it was now advisable to attempt a revision of the friendly agreements for the allocation of wavelengths in Europe in order that European Governments, having in mind the ratification of the Washington Convention, might make the most efficient use of the waveband reserved by this Convention to broadcasting. The Council took note of the work done by the Rome Conference in revising the Berne Convention copyright. The Conference has permitted each Government to lay down in its own country a favourable formula for the exercise of this right in the case of broadcast works. The Council likewise followed the suggestions of the Rapprochement Committee for the establishment of uniform monthly statistics, with the object of gaining the greatest possible advantage for listeners from the artistic and educational efforts of the different countries.

Short waves—their use and abuse, might well be the headline for a report of the Berlin correspondent of the London *Daily Telegraph*, who cabled recently as follows regarding a lecture by Professor Esan, of Jena University, who addressed one of the German scientific societies recently in Bremen, on the results of his experiments carried out during the last twelve months, with ultra-short waves, viz, 3 metres and under :—

"In the field of communication," says the correspondent, "he succeeded with a fraction of a watt, using ordinary broadcasting tubes without antennæ in covering distances of 25 kilometres (15½ miles) and more. With higher energy he increased this distance to 400 kilometres (250 miles), and he hopes in the early future to extend it to 500. He also succeeded in telephoning with these short waves. The sender he employs is no larger than a cigar box, and 'he has constructed a receiver which solves with amazing simplicity the problem of detecting ultra-short waves.'

"Professor Esau had already used ultra-short waves to kill mice, rats and rabbits, but he has now demonstrated their therapeutic value. Of 30 mice which had been inoculated with tuberculosis, half were exposed to ultra-short waves and the other half were not. The latter gradually sickened and died, whereas fifteen treated with the waves "remained as fresh and lively as before inoculation." Careless treatment with ultra-short waves may, however, be dangerous to human life, in consequence, as the Professor believes, of the transformation of albuminous substances which it causes in the body. When a human being is exposed to the influence of these waves, his temperature rises one degree per second. Herr Esau also found that bleeding wounds rapidly closed and cicatrised when treated with ultra-short waves."

Much has been made of the experiments during the German President's visit to Kiel of the wireless-controlled movements of the old 12,000-ton battleship, the *Zaehringen*, by the British press, which in some cases, at any rate, appears to have already forgotten that, as the Naval Correspondent of the *Telegraph* reminded its readers, "as far back as 1919 the American naval authorities converted the old battleship *Iowa* into a radio-controlled target ship, and very soon afterwards the British Admiralty did the same with *H.M.S. Agamemnon*. Both these vessels were quite successful. The *Agamemnon* served as fleet target ship for six years. Without having a soul on board she could be made to steam through a wide range of speeds, to stop, go ahead or astern, and perform a number of evolutions."

In fact the *Agamemnon* has already been scrapped, and the *Centurion*, a much larger ship, has been similarly equipped with the latest improvements in the way of distant control. Actually the naval Robot has been a *fait accompli* for nearly a decade!

Similarly, the use of the "invisible ray," also recently reported as a novelty which was, I believe, first made public by Professor McLennan, also in 1919.

Fortunately, the latter invention may prove one of the new *Arts as applied to Peace*, for it is certain to play a most important part in the increasing of safety at sea, as it is equally efficient by day and night and also in the thickest fog.

GREAT BRITAIN.—Thanks to the "Regenerator" system so successfully extended and worked over the Eastern Telegraph Company's system during the last twelve months or more, London and Bombay have now been placed in direct telegraphic touch. In addition to enabling the company to give a quicker service it is obvious that there must be a decided saving of staff by this elimination of human aid for re-transmission purposes, at so many points over the company's system.

There would sure to be a certain number of the personnel who are approaching pensionable age and one would not be surprised to hear of any redundancy being met by premature retirements on generous terms.

The expenses on plant due to the installation of the "Regenerator" system have included a new cable or cables between Alexandria and Port Said, as well as multiple core underground cables beside the canal from the Mediterranean end into Suez itself. Heavy as such initial expense may be, the deterioration of plant is not likely to proceed at an abnormally rapid rate.

The laying of the Western Union Cable Company's new and high-speed cable connecting Bay Roberts, Newfoundland, and Horta, Fayal, Azores, was effected a few days earlier than anticipated in last month's "Memorabilia."

The Telegraph Construction & Maintenance Co., London, manufactured and laid the cable, which represents a distinct departure from the usual deep-sea cable. A special alloy has been used in its manufacture. It is interesting to recall that it was in the summer of 1858—just 70 years ago—that Americans assembled to honour Cyrus Field and his companions on the completion of the laying of the first transatlantic cable.

The present cable was laid by the British cable ship *Dominia*, which completed the task of laying the deep-sea portion in six days, despite the fact that at one time for a period of 24 hours it was impossible to take sights owing to cloudy weather. Nevertheless, the chartered route was maintained with absolute precision. The last part of the work was carried out in a howling gale, and the deep-sea end was buoyed 20 miles off Horta on Aug. 30.

When the weather abated the shore end was spliced, and communication was established with New York, via Bay Roberts, just eight days after the *Dominia* started on her voyage from Newfoundland. The new line will be brought into commercial operation as soon as the necessary engineers' tests have been concluded.

The Azores—the telegraphic Clapham Junction—has therefore yet another and perhaps the fastest submarine cable service with the United States of America, and by means of the direct cables serving Germany, Italy, Spain, Portugal and Africa should be able to give these countries a 24-hour cable service of indisputably good quality—and let it be admitted a very strong rival to wireless means of long-distance communications in the "pull baker pull devil" struggle between the two methods now proceeding.

The return from the United States of the Post Office party of five officials who left our shores on the 8th ult., will be awaited with more than usual interest and not without a certain amount of natural curiosity. As is generally known, the party was headed by Mr. L. Simon, Asst. Secretary in charge of the British Inland Telegraph Service, Mr. J. Stuart Jones, Controller of the C.T.O., Lt.-Colonel A. G. Lee, Asst.-Engr.-in-Chief, Mr. G. T. Archibald, Inspector of Telegraph Traffic, and Mr. A. E. Stone, Asst.-Engineer on the E.-in-C.'s staff. The visit is being made as the result of one of the recommendations of the Hardman-Lever Report on the Inland Telegraph Service of Great Britain.

The wireless world in all its various sections has been much moved by the two decisions of the Comptroller-General of Patents upon the applications for compulsory licences made by the Loewe Radio Co., Ltd., and the Brownie Wireless Company of Great Britain.

The applications were made early in August, but the decisions were not given until late in the same month, and on broad lines were respectively as follows :—

In the case of the Loewe Company, the company should receive a licence from the Marconi Company to manufacture Loewe valves in this country and that the royalties should be 7*s*. 6*d*. on double valves and 10*s*. on triple valves, the amount to be paid on other multiple valves to be assessed at the rate of 5*s*. in respect of the first unitary valve and 2*s*. 6*d*. for each additional valve. The Tribunal stated that the royalties proposed to be charged by the respondents, viz., £1 17*s*. 6*d*. and £1 5*s*. on the triple and double valves, respectively, and £3 2*s*. 6*d*. on long-range sets, were too high, and were prejudicing the establishment of a new industry in this country. It is noted that not one of the five patents in question was for an invention originating with the Marconi Company, but the latter had gathered them into its own hands and established a kind of "super-monopoly." The respondents, the Marconi Company, had certainly expended large sums of money in radio development, however, and were entitled to some reward. A period of 21 days has been allowed (from Aug. 24) for the submission of an agreed form of licence. Failing this, an order will be made by the Comptroller-General.

As regards the Brownie Company claim, the Tribune expressed its opinion that the monopoly rights under the respondents' patents had been abused, and it was necessary to consider the question of relief. It was therefore decided that the Brownie Company should be given a licence to manufacture receiving sets under the patents in question, the royalty to be 10% of the wholesale selling price, with a minimum of 5*s*. for the first valveholder and 2*s*. 6*d*. on each subsequent holder. If the parties could not reach an agreement in the matter, it would be necessary for the Comptroller-General to make an order giving effect to the decision. The Tribunal pointed out that in addition to the specific case before it the general question of the granting of licences on reasonable terms arose, but upon that it was unable to go further than to define the relief to which the present applicants were entitled.

The Electrical Review, in a leading article on these decisions ordering the Marconi Company to grant licences for the manufacture of receiving sets under considerably reduced royalties, remarks :—

"The decision is a momentous one. It has been generally felt that the existing royalty is too great; with the cheapening of production it represents a very considerable proportion of the total cost, especially in the low-priced sets.

"Although the decision applies so far only to the applicants in the case, there is no doubt that the principle will have to be extended to all licensees

under the patents involved, and the result should be a considerable impetus to the sale of receiving apparatus. It seems safe to say that the crystal set will be superseded even in many poorer homes."

The matter is not settled yet, for the Marconi Company apparently intend to appeal against the decisions. At the same time the latter company has made it clear that if the decisions are confirmed by the High Court (the final point of appeal), other manufacturers than the two appellant companies will be able to obtain licences on similar terms as from the date of the confirmation.

As, according to the *Wireless World*, there were nearly 200 valves, either entirely of a new type or comparatively old with improved characteristics on exhibition at the National Wireless Exhibition held at Olympia last month, it is not difficult to agree with the *Review* that the decisions if confirmed may well be described as momentous.

As we go to press, it is interesting to note that some of the big London stores are not waiting to hear the result of any further possible appeal but have already reduced valve prices by as much as those mentioned in the Comptroller's decisions.

Aberdeen.—For the first time picture transmission by wire was carried out between England and Scotland on the 14th ult., when pictures of the Braemar gathering were "wired" to London for the *Daily Sketch*, and subsequently published in the pages of the latter paper. The Belin system of telephotography was used.

Glasgow.—A site has been provisionally selected for the erection of a B.B.C. high-power regional broadcasting station near Glasgow. If, as is anticipated, the plans are passed by the Postmaster-General within a week or two, work will commence on the new station almost immediately. A start has already been made at the site of the London station at Potters Bar.

Manchester.—The next station to be built will be one near Manchester, and by the end of 1929 the new London and Manchester stations should be in full working order, says the *Daily Telegraph*. Plans for the other stations will soon be put into operation. The Regional Scheme is expected to be complete by 1930.

Portsmouth.—A curious point of law! At Portsmouth County Court, on Aug. 16, the Postmaster-General claimed damages from William Latter, licensee of the King's Head, Wickham, for injury to telegraph wires consequent upon a fire at his premises in October last, caused by the defendant falling on the stairs while carrying a paraffin lamp. The heat from the fire reached the telegraph wires in front of defendant's premises. It was contended that the lamp was dangerous.

The Judge said that if the Act applying to the case did not protect a man when simply carrying an ordinary lamp, it seemed to him to be a farce. He dismissed the action with costs, but gave leave to appeal.

Broadcast radio-receiving licences current in Great Britain at the end of June, 1928, numbered 2,511,736, an increase of 5,477 during the month of June. The following interesting figures, issued by the Bureau Internationale de Radiophonie at Geneva, are an indication of the approximate number of licensed listeners in some of the countries of Europe: Austria, 293,408; Denmark, 214,734; Hungary, 98,011; Lithuania, 9,407; Norway, 64,722; Switzerland, 66,731; Sweden, 357,828; Czecho-Slovakia, 225,501.

Some interesting details of exports of radio apparatus from this country during the first half of the current year have been published by the *Wireless Trader*. From these it is seen that the total value was £586,322, as compared with £643,938 in the first six months of 1927. Our leading customer was again Australia, but its share declined from £124,950 to £76,332. Japan fell to third place. A large increase—from £25,419 to £46,226—placed France second in the list. Other important customers were the Netherlands (£37,281 against £35,055), South Africa (£33,281 against £10,526), India and Burma (£30,966 against £43,924), the Irish Free State (£22,622 against £13,937), New Zealand (£20,397 against £33,022), Bulgaria (£19,802 against £63), and Belgium (£18,348 against £9,191).

The British Broadcasting Corporation state that during the next two months relay stations will take over the national exclusive frequency of 1,040 kilocycles (288.5 metres), replacing the international common frequencies which they have been sharing with stations abroad. The process will be a gradual one, each station changing its frequency as soon as the necessary additional plant is installed. Heterodyne interference has become so serious on the international common frequencies that the service areas of relay stations have shrunk to from half a mile to two miles radius during the hours of darkness, thus seriously discounting their value under existing conditions. Pending the introduction of the Regional Scheme, rather than withdraw the relay stations, an attempt will be made to revive their usefulness by the expedient of single-wavelength working. It is anticipated that this will considerably improve conditions of reception, particularly in thickly populated areas. Leeds will continue on its present frequency of 1,080 kilocycles (277.8 metres). The exclusive frequency of Bournemouth—920 kilocycles (326.1 metres)—will be transferred to Aberdeen, and the transmitter at Bournemouth will continue its service on the national frequency of 1,040 kilocycles (288.5 metres). The disadvantage of the changes will be some reduction of the proportion of local programme material at relay stations. During the main evening period of transmission all ten relay stations will be bound to radiate the same programme. Experience proves that after nightfall stations on the same frequency, even a considerable distance apart, radiating different programmes, seriously interfere with each other's service. In the daytime, when interference is less acute, "group" transmissions will probably be satisfactory ("group" programmes are those originating within the region concerned).

The Elimination of Fading?—Experiments are to be made by the British Broadcasting Corporation, in association with the National Broadcasting Company of America, with the object of relaying American programmes to British listeners by a new method, says *The Times*. Fading has been one of the chief obstacles to successful broadcasting across the Atlantic, but it is now hoped that a remedy for it will be found. The experiments in reception will be carried out at the receiving post of the B.B.C. at Keston, and the transmissions will be made from the short-wave stations of the General Electric Company, Schenectady.

The B.B.C. receiving station at Keston will use, according to the *Wireless World*, five separate receivers on wavelengths varying between 16 and 50 metres, to pick up five individual transmissions of the same programme from the satellite stations of WYG at Schenectady. For relay purposes the five receivers will have a common output. This method of avoiding fading and atmospherics has been advocated by Dr. Alfred N. Goldsmith, of the U.S. National Broadcasting Company, as well as by Capt. P. P. Eckersley.

Picture Broadcasting.—The B.B.C., in conjunction with the General Post Office, has concluded some preliminary technical experiments in the wireless transmission of still pictures. As a result, arrangements have been made for a short picture transmission daily from Daventry (5XX) outside regular programme hours. These transmissions will begin this month. The material of each transmission will consist of a selection from several subjects. If and when it is discovered that there is a sufficient public demand for "still" pictures radiated in this way, transmissions will be included in regular programme hours. The Fultograph system will be used for the series of transmissions beginning in October.

Provision is to be made for radio picture transmissions in the new B.B.C. building, which is to be erected near the Queen's Hall, London. The main studio, where these transmissions will be given, will accommodate an audience of 1,000.

It is understood that the new premises will be known as "Broadcasting House," and that they will take nearly three years to complete.

Television Broadcasting.—The wireless correspondent of the *Daily Telegraph* writes: Some time ago the Baird Television Development Co. applied to the Post Office for a license to broadcast a television service, and as a result I now hear that a Post Office test of the Baird system has already been made and that other tests will soon take place.

"In well informed quarters," adds the correspondent, "it is considered very probable that a limited number of *public* tests will also be made, in order that listeners (? spectators) may have an opportunity of judging for themselves."

GUERNSEY.—The Guernsey States Telephone Department, says the *Electrician*, has arranged a service by which subscribers may be informed of the first definite news of the mail boats' approximate time of arrival, a special wireless receiver having been installed at White Rock for this purpose.

IRISH FREE STATE.—According to the Irish Free State Department of Industry and Commerce, shipping statistics show that wireless sets and components valued at £27,848 were imported by the Free State during the period January to March last. Of this, Great Britain contributed goods to the value of £27,004 and Northern Ireland £536.

ITALY.—When the Genoa and Turin stations are completed towards the end of this year, Italy will possess six broadcast transmitters. The newest installation was completed in 32 days, the Ente Italiano per le Audizioni Radiofoniche, having decided upon its erection only a month prior to its inauguration on July 12 last. Situated between Merano and Bolzano in Italy's Alpine provinces (formerly Austrian), the station's aerial power is 200 watts and its wavelength 400 m. (750 kc.); the two-wire L-type antenna is suspended between two lattice steel masts 131 ft. high and 262 ft. apart. The copper-wire earth network is 2 ft. below the surface.

JAPAN.—Reuter's New York agency states that the Radio Corporation of America has announced that a direct wireless circuit has been opened between San Francisco and Tokio.

There are at present over 30,000 radio-licence holders in Japan.

It is worthy of note that the imports of radio apparatus from Great Britain only amounted to £45,383 for the current half-year as against £103,000 for the corresponding six months of 1927.

JUGO-SLAVIA.—Mr. E. Murray Harvey, O.B.E., M.C., British Commercial Secretary at Belgrade, has forwarded to the Department of Overseas Trade, a report on the economic conditions in the Serb-Croat—Slovene Kingdom, from which interesting document the following extract is perhaps appropriate to these columns:—

"Among the improvements which are being carried out is the extension of the telephone system. Automatic exchanges, the material for which was obtained from Germany on reparations account, have been installed at Novi Sad and Zagreb, and the Belgrade exchange is also to be converted to the automatic system. Telephonic communication with many large European towns is in existence, and will shortly be established with Zurich and Paris. Tenders have been received for an important system of underground telegraph cables, and the necessary equipment, relay stations, &c., to provide a number of lines for international service. The scheme is estimated to cost some 300 million dinars (over £1,000,000), and the firms tendering were asked

to arrange for payment to be spread over at least 12 years. There has been a certain increase in the number of radio sets in use, there now being some 12,000 throughout the Kingdom, of which 8,000 are in Zagreb alone. The apparatus in use is principally of the cheaper Austrian and German makes. The broadcasting station at Zagreb will shortly be supplemented by one at Belgrade, for which a local company has recently obtained the concession; the apparatus will be supplied by Marconi's Wireless Telegraph Co., Ltd. A further station is to be erected at Ljubljana, for which the material will be obtained on reparations account. The Ministry of Posts and Telegraphs now possesses a small 10-w. experimental broadcasting station. The new Belgrade station is to be of 9 kw., and it is expected that on its completion much more general interest in radio will be taken in the capital."

With reference to the proposed large deliveries of telephone cables to the Government of Jugo-Slavia, it is stated that the Government at Belgrade has not adopted the recommendation of a committee which was appointed to consider the offers sent in and which suggested that the orders should be divided between the English Standard group and the German Siemens group. The Government has invited representatives of the two competitive groups to enter into further negotiations, mainly regarding the conditions of the loan which both groups have offered for the financing of the work. The value of the deliveries is stated to amount to between six and seven million dollars, an amount which *The Electrical Review* with some reason is inclined to question, probably because the figures given are neither quoted in the currency of the two chief competitors or in *dinar* of the country chiefly concerned.

LIBERIA.—The Radio Corporation of America has been authorised by the Washington Government to establish a direct wireless service to Liberia.

MEXICO.—A radio transmitting station—XC 51-44 *metres*—has been established in Mexico City and broadcasts Mexican news at 9 a.m., and at 9 p.m. every day. The station is powerful enough to be heard all over Europe.

NORTHERN IRELAND.—The Ulster Wireless Traders' Association (which has now a membership of 90% of all appropriate traders in Northern Ireland, will this year open its fourth wireless exhibition in the Ulster Hall, Belfast, on the 4th of the present month.

PITCAIRN ISLANDS.—Pitcairn Island is probably the world's loneliest settlement, without any means of communication. Some of the enterprising islanders, as a means of breaking down their extreme isolation, began to learn the Morse code from books with the aid of Morse keys and buzzers given to them by the Marconi operators aboard the ships that called. In 1921 they obtained a simple crystal receiver and in 1926 they were given a Marconi Type-31 ship's crystal receiver. With an aerial 180 ft. long supported in the middle by a single mast 70 ft. high, they have obtained excellent results, and on one occasion they received messages over a distance of 400 miles from a ship. The success and utility of the results led the islanders to desire a means of sending messages to ships as well as receiving. In order to do this it was necessary for one of their number to qualify as a wireless operator in New Zealand, says *The Electrical Review*, the nearest point of civilisation. After passing his examination he came to London, and at the Marconi works he was presented with a ship's spark transmitter of $\frac{1}{4}$ kw. power for the benefit of the islanders. The inhabitants of Pitcairn number about 200, and among the few "outsiders" living there is an American engineer who possesses a stationary petrol engine that will probably be used to provide the power for the transmitter.

POLAND.—The Warsaw correspondent of the *Daily News* states very definitely that the Polish Ministry of Posts and Telegraphs has broken off negotiations with the International Telephone and Telegraph Corporation of New York, on the work of exchanging the Warsaw telephone wires from overground to underground and the laying of new cables.

A sum of £1,000,000 is to be spent on the work.

British firms are to be asked to quote, the American tenders being too dear.

RUSSIA.—According to a reliable technical contemporary, the Soviet Government is reported to have concluded preliminary arrangements with the Radio Corporation of America for the exchange of patents.

SOUTH AFRICA.—*World-Radio* states that the transmitter in the new Johannesburg station of the African Broadcasting Company is being rapidly completed, and should be in operation in about a month's time. The new station will employ twenty times the power of the existing Johannesburg station. The transmitter will make use of the "low-power modulation" system so successfully employed by the B.B.C. at Daventry. Apart from the many smaller valves required in the initial stages of amplification, the transmitter employs five water-cooled valves each of which has a capacity of 10 kw. The aerial system will be supported on two special lattice steel masts 160 ft. high and 300 ft. apart, similar to those which have been erected at Daventry. The earth system will consist of twelve miles of copper wire buried in the ground at a depth of eight inches, to form a herring-bone pattern. The station is about nine miles from the city, and will be connected to the studio by an overhead telephone line. The old Johannesburg equipment will probably be transferred to Bloemfontein, and will relay the Johannesburg programmes. Another relay station may be erected at Maritzburg—a mountainous district, in which reception is difficult.

SPAIN.—Reuter's Corunna agency state that it is claimed at Corunna that the trials of the "pilot cable" devised by a French engineer, M. Loth, were attended with great success when demonstrated before General Primo de Rivera, the Premier, and members of the Cabinet. The gunboat "Dato," guided by the cable, performed evolutions with remarkable precision in the canal, listening for warnings from the cable every few minutes while in the "danger zone." Pilot cables will be installed in all other important Spanish ports.

SWITZERLAND.—*Distant music!* Wedding music was supplied by Radiophone across the Atlantic when Mr. William Chase Paulton, an Army officer, was married, in Manchester, Massachusetts, to Anne, daughter of Mr. and Mrs. Carl Pullen Dennet, on the 2nd of last month.

Sitting in the Villa Garengo at Celigny, on the shores of Lake Geneva, Mr. Ernest Schelling, the well-known pianist, played Mendelssohn's Wedding March. The music passed over telephone wires to London, and thence by radio to Massachusetts, where it was amplified for the benefit of the wedding guests as soon as the procession started. Schelling was a pupil of Paderewski.

The League of Nations and Wireless.—A Reuter message from Geneva states that the Secretariat of the League has communicated to the States members of the League the supplementary report relating to the establishment of a League wireless station to be used by the Secretariat in times of crisis, which will be considered at the forthcoming meeting of the Assembly. The Federal Political Department, in a covering note, considers it indispensable that the Federal Government should possess the power in times of crisis to delegate an observer at Geneva whose duty it should be to inform the Federal Government regarding the activity of the station.

The report of the Secretary General contains an offer from the Swiss Government, the principal points of which are as follows: The wireless telegraph station to conform to the technical conditions indicated by the experts of the League, and to be constructed in the neighbourhood of Geneva by the Swiss Wireless Company. In normal times it is proposed that it should be administered by this Company, which would afford to the League of Nations all the customary facilities and necessary priorities. In times of crisis the station would be handed over to the League of Nations, which would utilise it freely and on its own responsibility. In both events the needs of private and commercial traffic would be taken into consideration. The financial arrangements would provide for an equitable division of charges and receipts as between the Swiss Administration and the League of Nations. In general the report follows the lines of the recommendations made by the Committee of Experts on Telegraphic Developments.

SWEDEN.—According to the statistical report of the Swedish Telegraph Department for 1927, which has just been published, there were, at the end of 1927, seven broadcasting stations belonging to the telegraph service, with an average yearly service of 2,043 hours per station, and 24 smaller private relay stations. The big Motala station was put into operation in the middle of 1927. The stations at Gothenburg and Malmö are to be enlarged to 10 kw. and will use their present wavelengths. The number of licences granted at the end of the year was 328,133 or 53.9 per 1,000 inhabitants, as against 242,559 and 39.9 respectively at the end of 1926. Of these Stockholm took 56,931 or 90.5 per 1,000 inhabitants (80.0 in 1926), Gothenburg 29,051 or 77.4 per 1,000 (81.6) and Malmö 16,703 or 98.7 per 1,000 (101.9).

TASMANIA.—*The Electrical Engineer of Australia and New Zealand*, states that the Tasmanian broadcasting station, 7ZL Hobart, has been acquired by the Dominion Broadcasting Co. Pty., Ltd., proprietors of 3LO and 3AR, Melbourne.

U.S.A.—Reuter's New York Agency informs us that use of the wires and other facilities of the American Telephone and Telegraph Company, which is now enjoyed by the Western Union Telegraph Company, has now been extended also to the Postal Telegraph Company by virtue of contracts, the signature of which was officially announced on Aug. 23. A great increase in competition between the two rival companies is expected as a result of the new arrangement.

[There are some 2,000,000 miles of land telegraphs in the United States. With the exception of a few hundred miles owned by the Government in Alaska and localities where there are no commercial lines, the whole system has been constructed by private enterprise and is operated by 24 companies. Of these the three named above own the greater part of the mileage.—ED., *T & T. Jnl.*]

The Postal Telegraph Company put into commercial operation on Sept. 5 in the United States a new photo-telegraphic service. One part of the service permits of the sending, between any two of eight of the largest cities of the country, of telegraph messages which will be delivered to the addresses in facsimile. The charge for such messages is one and a half times the ordinary commercial telegraph rate. Thus, a ten-word message by photogram from New York to Boston, for example, costs 54 c. (2*s.* 3*d.*), to Cleveland 72 c. (3*s.*), to San Francisco $1.80 (7*s.* 6*d.*). Another part of the service provides for the transmitting of pictures, documents, advertisements, &c., messages in, for example, Chinese or Hebrew; in fact, anything that can be photographed. The charges for sending photogram pictures, on a plate 5 in. by 7 in., from New York, are $15 (£3) to Boston or Cleveland, $20 (£4) to Atlanta or Chicago, $25 (£5) to St. Louis, and $45 (£9) to Los Angeles or San Francisco. These services, says *The Times*, have been made possible by a contract with the American Telephone and Telegraph Company, mentioned above.

Though radioed over but a very short distance, what may be fairly described as the first telegraph transmission of an actual drama in which its two actors were both seen and heard performing, took place a month ago between the studio of the General Electric Company's laboratory at Schenectady and receiver sets placed in position three miles away. The pictures were only three by three inches and were somewhat blurred, but Dr. Alexanderson is now engaged in experimenting on pictures quadruple the size,

GENERAL ITEMS.—*Private Companies.*—The usual quarterly dividend of 5*s.* per share free of tax has been declared by the Globe Telegraph and Trust Company, Ltd.

Technical Societies.—The programme of informal meetings of the 1928-29 session of the Institution of Electrical Engineers contains the following interesting and varied subjects :—

Oct. 29.—Discussion on "Our Profession from a Manufacturer's Point of View." (Opened by the President, Lieut.-Colonel K. Edgcumbe.)

Nov. 12.—Discussion on "Engineering Requirements of a Modern Office Building." (Opened by J. Coxon.)

Nov. 26.—Discussion on "Picture Telegraphy." (Opened by Mr. E. S. Ritter.)

Dec. 10.—Discussion on "Power Factor Tariffs and Methods of Metering." (Opened by Mr. E. W. Dorey.)

Jan. 14.—Discussion on "Electric Trolley Omnibuses." (Opened by Major A. Jenkin.)

Jan. 28.—Discussion on "Mains Testing." (Opened by Mr. F. C. Raphael.)

Feb. 4.—Discussion on "Earthing and the Safety of the Public." (Opened by Mr. W. R. Rawlings.)

Feb. 18.—Discussion on "Modern High-Power Rectifiers—their Development and Use." (Opened by Mr. R. L. Morrison.)

The School of Electrical Engineering (Wireless and High Frequency Section) will open on September 24, when a series of special courses on Radio Engineering will be given by Messrs. R. S. Elven, J. A. Gracie, A. Serner, S. T. Short, H. A. Thomas, A. C. Warren, and W. West. The courses are spread over a period of five years, and cover mathematics in addition to theoretical and practical considerations of the subject.

The 1928-9 session of the Institute of Wireless Technology will commence in October and an attractive programme is being drawn up. A review of the past year's activities indicates a very satisfactory state of affairs, the Journal of the Institute, especially, having given increased satisfaction. The growth of the Institute continues. Those interested in the Institute are invited to communicate with the hon. secretary: Harrie J. King, F.C.C.S., 71, Kingsway, London, W.C.2.

For Our Advertisers.—Contracts Open.—Where not otherwise stated, quote reference number and apply Department for Overseas Trade, London, S.W. :—

Rangoon Municipality, Oct. 19.—Supply of instruments and apparatus for installation of street fire alarms on close circuit principle. Specification, &c. (10*s.* per set), from Messrs. Ogilvy, Gillanders & Co., 67, Sun Court, Cornhill, London, E.C.3.

Victorian Electricity Commission, Oct. 22.—Transformers and spares, for Yallourn power station and Richmond terminal station (specification 28/44). (Reference B.X. 4,637.)

Postmaster-General's Department, Melbourne, Oct. 23.—Insulated wire. (Reference B.X. 4,674.)

Postmaster-General's Department, Melbourne, Oct. 27.—Supply of loading coil-pots. (Schedule C.361.) (Reference B.X. 4,695.)

Egyptian Ministry of the Interior, Oct. 29.—Supply of d.c. generator, for Beni Mazar power station. (Reference B.X. 4,660.)

New Zealand Public Works Department, Oct. 30.—Protective relay system. (Reference B.X. 4,573.)

Postmaster-General's Department, Melbourne, Nov. 6.—Automatic telephone switching equipment (schedule C. 353). (Reference B.X. 4,638.)

South Africa, Nov. 9.—Department of Posts and Telegraphs.—Supply of wall-pattern telephones for Hillburn Exchange. (D.O.T.)

Postmaster-General's Department, Melbourne, Nov. 13.—Switchboard keys and parts. (Schedule C. 362.) (Reference B.X. 4,396.)

The list of departures from the C.T.O. upon arriving at "The Day" in their official life is as follows, to all of whom the best of best wishes for the coming rest-years: Mr. A. H. Bell, Superintendent, Mr. J. A. Buffin, Assistant-Superintendent, Mr. A. J. Jellie, Superintendent, Higher Grade.

To Captain A. J. Cherry, M.C., congratulations on his promotion to Superintendent, Higher Grade, also to Mr. A. Matthews, who steps into the Captain's Assistant-Superintendent shoes, and to Mr. L. N. Collingham, also from Overseer to Assistant-Superintendent rank. The latter's appointment is back-dated to August 12.

To London Telegraphists a visit to the Radio Section of the Science Museum, South Kensington, should prove an inexpensive afternoon's entertainment, with its free admission. The latest additions are: A model of the wireless transmitting station at Rugby, where a power of 1,000 kw. is controlled by a tuning fork, a mechanical representation of the operation of a valve and a model of the Bodmin Beam station.

TOLERANCE.—Tolerance is a lesson often needed quite as much in the hearts of a minority as of a majority. Tolerance means reverence for *all* the possibilities of Truth.—*John Morley's "Gladstone."*

J. J. T.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at July 31, 1928, was 1,669,094, representing an increase of 6,893 on the total at the end of the previous month.

The growth for the month of July is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at July 31	592,553	1,076,541
Net increase for month	2,692	4,201
Residence Rate Subscribers—		
Total	137,908	219,003
Net increase	805	1,365
Call Office Stations—		
Total	5,370	19,387
Net increase	57	139
Kiosks		
Total	1,044	4,256
Net increase	51	117
Rural Party Line Stations—		
Total	—	10,268
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	—	963
Net increase	—	27

The total number of inland trunk calls dealt with during May (the latest statistics available) was 9,347,597, an increase of 745,246, or 8.7%, as compared with May last year.

Outgoing international calls in May numbered 35,931, and incoming international calls 40,899, representing increases of 8,203 (29.6%) and 12,153 (42.3%) respectively over May, 1927.

Further progress was made during the month of August with the development of the local exchange system. New exchanges opened include the following :—

PROVINCES.—Wilpshire (automatic), Haywards Heath,

and among the more important exchanges extended were :—

PROVINCES—Ashford, Bingley, Higher Broughton, Lytham, Poole, Rusholme, Smethwick, Watford.

Sixty-seven new overhead trunk circuits were completed, and 75 additional circuits were provided by means of spare wires in underground cables.

PROPOSED GATHERING OF EX-NATIONAL TELEPHONE MEN.

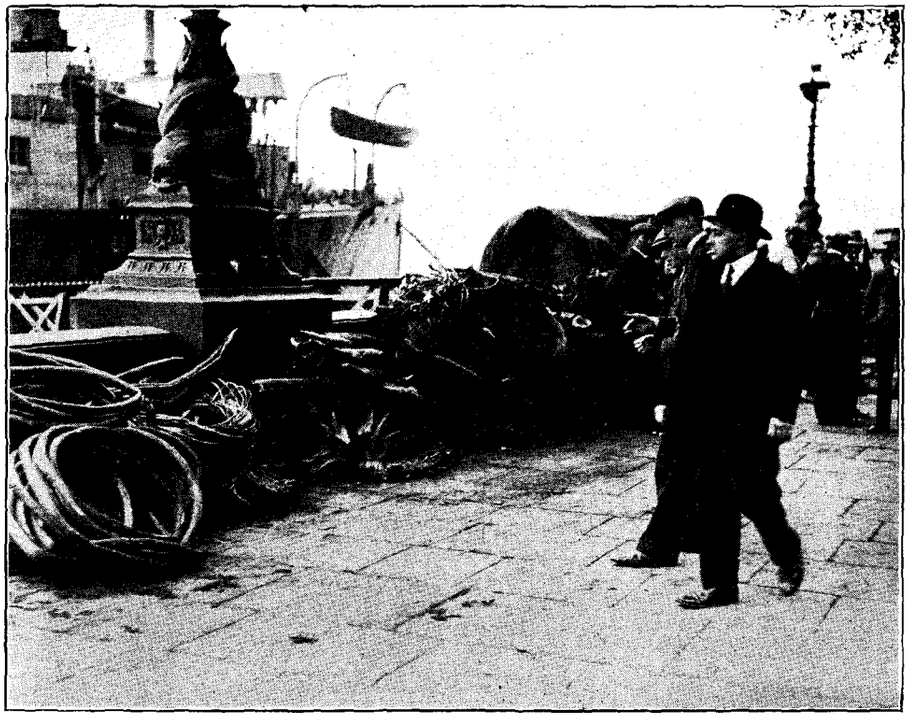
IN response to a wish which has often been expressed that a gathering should be held of ex-members of the staff of the late National Telephone Company, it is proposed to organise a Dinner in London some time in November or December.

The gathering will, of course, not be confined to Post Office members of the ex-National Company, but will embrace any ex-members of its staff wherever situate. About 60 names have already been received by Lieut.-Col. C. B. Clay (Hurst, Sundridge Avenue, Bromley, Kent), who will be pleased to receive the names of any further members who would like to attend.

FIRE IN THE EMBANKMENT SUBWAY, LONDON.

ON the evening of Sept. 8 the placid quietude of the Victoria Embankment on a Saturday evening was disturbed by the clanging of fire bells; smoke had been observed emanating from one of the ventilating shafts of the subway which runs under the footway on the south side of the road.

Following the alarm, fire appliances were quickly on the spot, and with that intrepid courage which characterises the London firemen, entry was made into the subway regardless of the volume of smoke, when it was found that a section of cabling, comprising power, telephone and telegraph circuits, was burning furiously. Steps were immediately taken to turn off the various electric supplies,



[By courtesy of the Topical Press Agency.

THE PICTURE SHEWS THE MASSES OF TELEPHONE CABLE DESTROYED BY THE FIRE STACKED UP ON THE EMBANKMENT.

and the firemen with the aid of smoke helmets and chemical extinc-teurs, attacked the flames, but so fierce was the blaze that their efforts were of little avail, and resource to water was finally decided upon, one of the river floats being brought into action and many thousands of gallons of water were pumped into the subway.

By this time several large telephone cables carrying junction circuits between exchanges in the City and West End, and junctions associated with the Trunk and Toll Exchanges, also cables carrying subscribers' circuits had been completely destroyed, and the effect was being felt in the exchanges affected in the form of innumerable lamp glows and failing junctions.

The magnitude of the breakdown was quickly recognised, and the usual emergency messages were despatched. Engineering officials were soon on the scene, and the work of repair commenced.

Throughout the Saturday-Sunday night the exchange staff proceeded steadily with the testing out, and the compiling of the lists of affected lines, the final estimate of lines affected being :—

Junctions	1,400
Central subscribers' lines	920
City „ „	380

The normal testing and plugging up arrangements in the City and Central Exchanges was inadequate to deal with such a number of faulty circuits, and arrangements were made to introduce portable tone-test units in order that all faulty circuits might be plugged up, and the appropriate advice tendered to callers.

The day following the fire being Sunday, normally a very slack day at the City exchanges, enabled a careful study to be made of the situation in preparation for the heavy Monday morning traffic.

The junction situation was first considered, as in a large number of cases routes both ways to exchanges were entirely down, but by the Tuesday morning the number of junctions out of order, which had arisen to 1,500 on the previous day, had fallen to 1,300, due to replacements by the Engineers by spare pairs on alternative routes, and by the week-end conditions had been improved to 50% of the normal number of circuits working in each route.

The 1,300 odd subscribers' lines which were down had also been receiving attention and were reduced by half by Sept. 17, and all, with the exception of two isolated lines, were restored by Sept. 25.

The dislocation of direct junction routes naturally threw a considerable burden on the operating staff, particularly at the Tandem Exchange. The normal day load at Tandem on Sept. 10 would have been about 178,000 calls. In actual fact it amounted to over 245,000 calls, and as can be imagined, congestion on many routes was inevitable, but this condition was appreciably ameliorated by the introduction of special operating measures.

Subscribers were advised of the probable delay on calls proper to the interrupted routes, as conditions would not permit offers to call to be made. In the case of Central alone, however, as many as 5,200 memorandum tickets in connexion with delayed calls were prepared in one day in respect of cases where subscribers asked to be called. It is estimated that it was possible to complete 95% of their requests.

At the time of going to press some 500 to 600 junction circuits are still faulty, but the work of repair is progressing steadily, and it is hoped that all will be in order within a few days, as the new cable pairs are brought into use.

A word of praise would, perhaps, not be out of place in respect of the manner in which the emergency has been met, and the loyal way in which all grades of the staff worked to minimise the trouble caused to subscribers. Special tribute should be paid to the jointing squads of the engineering staff who, under most difficult conditions, carried on cheerfully in effecting repairs.

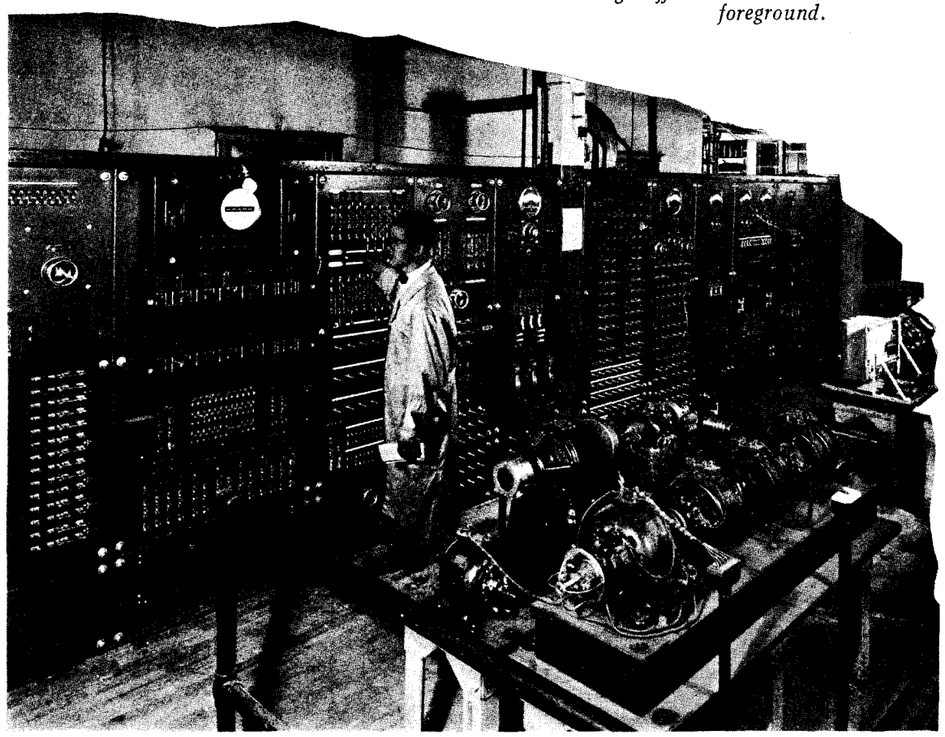
EXTENSION OF THE TRANS-ATLANTIC–BELGIAN TELEPHONE SERVICE.

ON October 1 the Trans-Atlantic Service will be extended to include all places in Belgium.

Where Strowger Automatic Leadership Begins—

The Laboratory Power Equipment.

The power board shown below has switching facilities for supplying for experimental purposes not only every kind of current that is used in an automatic telephone exchange, but also every kind that might be required for research or development purposes. Part of the generating equipment used for producing different currents is visible in the foreground.



THE Research and Development Department of Automatic Electric Inc. has an unusually extensive and complete equipment of power apparatus of every description. Motor-generator sets, rectifiers, storage batteries, ringing machines, dynamotors, interrupter sets—every type of equipment used in actual working exchanges for the production or control of electrical current is available for study and investigation. No new method of power control, generation of ringing current, storage battery operation or anything of the sort is approved until it has been subjected to rigorous comparative tests as to its practicability under actual working conditions.

The operation of the various laboratory power units is controlled and co-ordinated by the power board pictured in the illustration. Through its use, any kind of current is made available in any of the research rooms to engineers who may require it in running tests or investigating the performance of automatic telephone equipment. The exact fidelity with which actual exchange conditions can be duplicated through the use of this equipment accounts in no small measure for the consistent record of satisfactory performance which Strowger Automatic equipment has always established when it gets "out on the job."

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STROWGER AUTOMATIC

The
Telegraph and Telephone Journal.

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Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

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TELEPHONES IN RELATION TO PROSPERITY AND INTELLIGENCE.

The *Los Angeles Herald* asks: "What effect has the use of the telephone on the prosperity and intelligence of those who employ it? That question is a natural one after reading that the United States, Canada and New Zealand, in the order named, lead all the countries of the earth in the number of telephones in use *per capita*. No one will question the intelligence or the prosperity of those three countries, either." The writer goes on to point out that whilst the countries named are at the head of the list, Russia, Brazil, Mexico, Poland, Spain, Italy and Chile come last with less than one telephone per 100 inhabitants. He wisely concludes that "the question asked at the beginning still remains to be answered according to the analysis any thoughtful person may make of the statistics." Certainly the half-drawn inference would lead to the most questionable deductions. We shall be the last to deny the cultural significance of the telephone, or its uses as an index of the prosperity of any given country. But it can only be considered as an index in a loose and qualified sense, for an index to be valid must exhibit some sort of precise relation of figure to fact. The United States has over seven times as many telephones *per capita* as France, but who would venture to deduce that America is eight times as prosperous or eight times as intelligent as France? Europe, whose development has been retarded by the war and its after effects, affords small encouragement to the deductions of the enterprising statistician. The country most highly developed telephonically is Denmark, a prosperous state not directly involved in the war. Now Denmark has three times as many telephones *per capita* as Holland, another prosperous and non-combatant country. Could anyone seriously defend the inference that Denmark was thrice as intelligent as Holland? Moreover, even in the realm of communication alone—to mention no other aids and incentives to prosperity, no other gauges of intelligence—telephony is not the sole medium. Our telegraph colleagues, judging by telegraph statistics, could abase some European countries which are now exalted, and exalt others which are lowly from the telephonic point of view. The railway man, knowing that there are more miles of rail per square mile in Belgium than anywhere else, could point out that country as the most prosperous and intelligent in the universe.

Comparative telephone statistics are of the greatest value in their legitimate sphere; only when they are correlated with other factors can they serve as an index in economic studies. We commend this view especially to thoughtful—and other—persons who undertake to analyse them.

HIC ET UBIQUE.

A CROP of legends is arising around the transatlantic service. The large figures involved in the cost of a long call seems to dazzle the paragraphists, who magnify them to fantastic sums. Recently a weekly newspaper informed us that Americans in Paris wishing to keep in touch with their business at home travelled especially to London in order to ring up New York, returning to Paris after they had made the call. The writer seems quite oblivious of the fact that service from Paris to America has been in existence since March. "The calls are taken in periods of three minutes, costing £15 a time. The most usual length for a conversation is six minutes, which, of course, comes to £30." The arithmetic is flawless, but the facts are wrong. The charge for a 3-minutes' call to New York was reduced to £9—also in March last.

Then we have the story of the financier who spoke from Berlin to New York for a period of an hour and a quarter at an alleged cost of £400. The correct charge for such a period is nearer £250 than £400. There is a better foundation, however, for the "record" London—New York call of £285 recently chronicled in the Press.

The first automatic exchange in Paris was cut over on Sept. 22 by Mons. Cheron, the newly-appointed Minister of Commerce. All the telephones in the Carnot area had previously been equipped with dials which the subscribers were warned not to use before the appointed hour on the Saturday night.

The opening of the Carnot Exchange marks the first step in the conversion of all the telephones in the French capital to dial working. The programme extending over 10 years has been mapped out for the conversion of Paris to the Rotary Automatic System. Carnot contains equipment for 6,000 subscribers' lines.

In an official report of the Chief Telegraph Engineer of the New Zealand Post and Telegraph Department on telegraph and telephone developments in Europe and America is an interesting table of comparative statistics of radio broadcasting. From this there would appear to be 5,500,000 radio sets in use in the United

States, or 4.8 per 100 inhabitants, and 3,000,000 in the British Isles, or 6.2%. The figures are presumably only approximate, as we have not yet reached the 3-million mark in this country.

The 50,000th telephone in the city of Brussels has just been connected up. On July 31, 1914, after 30 years of existence, the system contained 18,258 instruments. At the end of 1921 the number was 19,768, 1923 26,005, 1925 36,011, 1927 45,246.

According to *The Electrical Review* an automatic telephone exchange is to be built at Tashkent, in Soviet Central Asia. The exchange will cost more than £200,000, and will be for 10,000 lines. Practically all the telephone exchanges that are now being built in the Soviet Union are automatic.

Telephone submarine cables have recently been laid between Sweden and the Island of Aland in the Gulf of Bothnia and between the Island and Finland, thus connecting Sweden with Finland.

A Sheffield Corporation tram driver brought to the offices of the *Sheffield Daily Telegraph* a large mushroom which he discovered growing in a crevice against the telephone box at Nether Green tram terminus. He stated that there were several smaller mushrooms and that probably, with the showery weather, there would be good crops there in future.

Those who believe in signs and portents may see here some prefiguration of the crop of telephone kiosks which are springing up everywhere like mushrooms.

REVIEWS.

"Post Office People." By John C. Craven. (Published by Percy Brothers, Ltd., Manchester. 128 pp. Price 1s. 6d.)

We welcome the appearance of these sketches, most of which appeared in *The Post*, in handy volume form. Mr. Craven has a lively vein of genuine humour which he exploits with considerable gusto in dealing with imaginary episodes in the daily lives of that preponderating body of our colleagues who operate telegraphs and telephones and deliver letters. He tries to solve the mystery "Why Dogs bite Postmen," and propounds theories of the origin of blushing pillar-boxes. He is at his best, we think, in satirical sketches, such as the "Marathon Postman," "Domestic Drama," "Holidays," "The Super S.C. & T," and others, but he successfully handles slight romances in the "Love Letter" and "A Telephone Romance." He expresses heretical views on the theory "there were giants in those days" in a sketch entitled "The Old Days." It will be gathered even from this brief notice that the book contains a varied and entertaining series of papers.

"International Radiotelegraphic Convention of Washington, 1927. (Published by H.M. Stationery Office. 177 pp. Price 2s. 6d. On sale at the Stationery Office, Adastral House, Kingsway, London, W.C.2.)

This book contains, in handy, cloth-bound form, the official French text of the International Convention above referred to with an English translation in parallel columns. Besides the purpose for which it is primarily intended, the book will serve French students in the service as a useful vocabulary of many technical "wireless" terms and locutions.

ROUND CORNWALL HOUSE.

THE recent removal of the London Contract Branch from St. Bride Street in the City to Cornwall House in Waterloo Road, has definitely established that building as the headquarters of the London Telephone Service. Before that removal, no sound and true Contract man looked upon Cornwall House as the real and effective headquarters of the Service. How could it be so regarded when the Contract Branch, the pivotal branch of the organisation, the branch whose work formed the start and foundation of the whole telephone edifice, was housed elsewhere ? This attitude may, perhaps, appear parochial, lacking, it may be, somewhat in breadth, but, after all, there is a good deal to be said for it. The useful man in an organisation is the man who believes that his branch is the most important in the whole establishment, that, wherever that branch is, there is the centre of things. He may be a nuisance at times, but, if he is willing to fight for the idea, to insist that his branch be given its full share of consideration, it is not likely to fall below par in efficiency.

Contract men, like other men who had crossed the river, regarded the removal to Cornwall House with mixed feelings. Whatever might be said for the accommodation in the new building, there seemed a concensus of opinion that the neighbourhood of Waterloo was not all that it might be, that it was below the standard of the City, that, in the main, it might be classed as a dull and dingy neighbourhood, that its streets and buildings contained little that was attractive, that it had few interesting associations.

Closer acquaintance with the neighbourhood has sensibly modified these views. Far from containing few attractive features it was found to contain many. It was found to be a steadily improving neighbourhood, one which had changed considerably within the last score of years, one which was on the eve of further changes. A new Waterloo Station had been built. New buildings had sprung up in Stamford Street and Waterloo Road. The new County Hall had conferred a definite status on the Waterloo side of Westminster Bridge. On the other side of the river, the widening of the Strand between the end of Waterloo Bridge and Charing Cross was on its way to completion, while the section running east to the Law Courts had been spaced out to receive the great new arteries of Kingsway and Aldwych. These new features, which it might be worth while to examine in greater detail, have given character and, in some cases, architectural distinction to the locality.

It is appropriate to begin with Waterloo Station, because the new station is the dominating feature of the immediate neighbourhood, and because it constitutes one of the most noteworthy improvements which have taken place in London in the twentieth century. Those who had occasion to use the old station will remember the approach from York Road, through a dark and musty tunnel, and the confused, almost chaotic, appearance which the station invariably presented. The new structure has a spacious carriage entrance from Westminster Bridge Road and a no less spacious exit to York Road, with adequate passenger exits and entrances to and from Waterloo Road, while inside, the platforms being all in one row, there is an absence of confusion even at the height of the holiday season. The station, which is the largest in Great Britain—the Waverley Station in Edinburgh comes next—was opened in 1923. It took twenty years to build, the explanation for the length of time being that the plan of gradual construction out of revenue funds was adopted, no fresh capital being borrowed for the undertaking.

Waterloo Bridge, considered by most people to be the noblest bridge spanning the Thames, naturally comes next to the mind. Its future is, at the moment of writing, uncertain. In May, 1924, the foundation of one of its main arches weakened, and for a short time the bridge was closed. The foundations were strengthened and a new temporary bridge built, since the completion of which, in 1925, a one way traffic system has been in force, the south bound traffic using the temporary bridge. At that time it was generally agreed that a new and much wider bridge would be constructed to take the place of the old structure, but the voice of the people was raised strongly against the proposed demolition of Rennie's masterpiece and a Commission, appointed to enquire into the cross river requirements of London, recommended the retention of the present bridge, strengthened and widened from twenty-eight to thirty-five feet. If this scheme, which will cost £850,000, as against a cost of £1,000,000 for a new bridge to take six lines of traffic, is adopted, the slightly widened bridge will still constitute, it is to be feared, a bottle-neck between the large and important arteries of Kingsway, Aldwych, and Wellington Street on the north side, and Waterloo Road on the south, but this is not, perhaps, the place to discuss a question which has given, and is still giving, rise to much acrimonious discussion among architectural experts and road authorities. It is interesting to recall, before leaving the subject of Waterloo Bridge, that the bridge was built by a private company, that as a commercial speculation it was so far unsuccessful that it is on record that two shares, of the nominal value of £100 each, were sold by auction for £10 (vide *City Press* of Jan. 6, 1872), that in 1877 the Metropolitan Board of Works purchased the bridge, and that in 1878 it was opened to the public free of toll.

That part of the Strand which abuts on the north side of Waterloo Bridge, being within a very short distance from Cornwall House, comes within the scope of this article. The widening of the western portion of the Strand, between Wellington Street and Charing Cross, has been before the public eye for an exasperatingly long time, for it began as far back as 1899, when the original frontage of the Hotel Cecil was pulled down, together with some adjoining buildings, and the present eight-storey building erected, the adjacent portion of the roadway being widened at the same time to eighty feet. In

1902, a practically identical process was applied to the Savoy Hotel, next door, the roadway in front of its new entrance also being set back in accordance with the new building line. Nothing more was done for a long time—until 1914, to be exact—when the old Tivoli Music Hall was pulled down, the present Tivoli Picture Theatre not, however, being erected until 1922. Since then a row of old buildings on the Charing Cross side of the new Tivoli has been demolished, and the new buildings set back, and a similar operation has been performed on the whole of the remaining buildings between the Savoy Hotel and Wellington Street, with the solitary exception of the building at the top of Savoy Street, at present occupied by the Agent General for Western Australia. It may, perhaps, be mentioned that while these sweeping changes were taking place on the south side of this portion of the Strand, the north side was left practically untouched, the only notable alteration, carried out without affecting the building line, being the disappearance of Exeter Hall and the erection on its site of Lyons' Strand Palace Hotel, now extending itself over the site formerly occupied by "Haxells."

The widening of the eastern portion of the Strand, between Wellington Street and the Law Courts, was carried out in the opening years of the century in conjunction with the Strand to Holborn improvement, and was, in comparison, a much more speedy affair. Space does not permit of more than a passing reference to this improvement, perhaps the most extensive carried out in London in recent years. The result, so far as the eastern section of the Strand was concerned, was a much wider thoroughfare—the average width of the section between Wellington Street and the Law Courts is one hundred feet—and the erection of a number of striking buildings on the north side. These buildings comprise the new Gaiety Theatre, a handsome building occupying the Aldwych-Strand corner on the west, Marconi House, Bush House and Australia House, which occupies the Aldwych-Strand corner on the east. The building of Bush House, one of the most striking office blocks in London, with its upper storeys "zoned" or set back in the American style, begun in 1920, extended over a period of four years. The building presents a restrained and dignified elevation on the Strand side to the exquisite little island church of St. Mary-le-Strand, while on the Aldwych side the gigantic recess of the great pillar-fronted pavilion effectively closes the long straight vista down Kingsway. Two new wings to Bush House are proposed, one of which, that on the west side of the central building, is, at the moment of writing, on the point of completion. The site between this wing and Marconi House has been acquired by the Indian Government for the erection of a building to be known as India House.

Stamford Street, built at the beginning of last century on a portion of Lambeth Marsh, runs between Waterloo Road and Blackfriars Road. The Blackfriars Road end has considerably improved in recent years, some attractive shops and a new headquarters building for Sainsburys, perhaps the best of the Stamford Street buildings architecturally, having taken the place of some old and rather dilapidated houses which formerly stood here. In one or other of these old houses lived and died John Rennie, the famous engineer, son of an East Lothian farmer, and the builder of Waterloo Bridge. Confronted with the question of Rennie's house when collecting material for this article, I made some enquiries at County Hall and received from Mr. Montagu Cox a very courteous letter with two admirable and instructive L.C.C. booklets containing particulars of Rennie's house and also of the house at 28, Bennett Street, a short street running off this end of Stamford Street, where John Leech, the famous *Punch* artist, was born. Mr. Montagu Cox mentioned—and Messrs. Sainsbury were good enough to write to the same effect—that both houses were demolished to make room for the new Sainsbury buildings. Further along Stamford Street, on the river side, are the large new premises of the Union Cold Storage Company. This building is devoid of architectural ornament, and its many windows are arranged in somewhat monotonous repetitive formation, while it is a question whether the beauty of the landscape is assisted by the huge enamelled iron signs, some of which are plainly visible, as, of course, they are meant to be, from the other side of the river. Let me add, however, that an interesting skyline is formed by the tower-like double attics, clearly introduced to break the monotony of the design. Nearly opposite is the Stamford Street Unitarian Chapel, a building remarkable—having regard to the size and character of the main structure—for its entrance feature of six massive Doric columns. Further east, opposite Cornwall House, is W. H. Smith & Sons' printing establishment, a rectangular building with an extensive glazed frontage to Stamford Street. Flanking Cornwall House are the new premises erected by Boots for the library and photographic materials branch of their business, and a few yards south of Cornwall House, in Waterloo Road, is St. John's Church, an edifice with an imposing Doric portico, the effect of which, however, is marred by the unimpressive steeple, an unnecessary architectural feature probably not to be found in the original design.

York Road, which runs between Waterloo Road and Westminster Bridge Road, does not call for much comment. The Waterloo end has been improved by the new carriage exit from Waterloo Station. At its other end, or, to be precise, at the corner formed by the junction of Westminster Bridge Road and Belvedere Road, a short road running parallel with York Road, stands the London County Hall, the new home of the London County Council. Designed in what has been termed the classic style domesticated, the County Hall building forms a strong contrast to the aspiring Gothic of the Houses of Parliament on the opposite side of the river. Its tiled roof, dormers, and high stone chimneys certainly give it an air of tranquil domesticity, and whether or not a building with domes and towers would have harmonised better with other buildings within view is, after all, a matter of individual opinion. The foundation stone was laid in 1912 and the building opened by the King in 1922.

York Road will, of course, disappear with the intended transference of Charing Cross station to the Surrey side of the river, the removal of the existing railway bridge, and the construction of a new road bridge across the river. The original suggestion for the new station was that it should be built on the site of Waterloo Junction, the small station through which south-eastern trains run between the present Charing Cross station and London Bridge. This proposal, which would have involved a long road route from the north side of the Thames, has since been abandoned and the new station will occupy the site where the Lion Brewery and the old shot tower now stand. The proposal includes the building of an embankment, similar to Victoria embankment on the other side, between the County Hall and Waterloo Bridge. The new roadway will clear up the present rather melancholy stretch of river front between these points and afford an attractive foreground for a railway terminus and hotel. It will also clear away the dingy and depressing property on the west side of Waterloo Road between the bridge and Waterloo Station, as one side of the new station will run along the whole length of that road from a point near the bridge to a point nearly opposite St. John's Church.

When will these great schemes be carried out? A writer in one of the architectural journals, after detailing the work step by step, estimated, rather pessimistically, I think, that it would take 20 years to effect their completion. More hopeful calculations range from nine to twelve years. The reconditioning of Waterloo Bridge and its widening to take four lines of traffic will first be taken in hand. Almost simultaneously will come the clearance of the triangular area between the County Hall, Waterloo Road, and the present Waterloo Station. Directly this area, which may be termed the Lion Brewery area, has been cleared, the building of the new station will proceed, followed by the clearance of the Middlesex side to make room for the approaches to the new bridge, one arm of which will lead to the Strand, and the other, which will itself form a bridge over the Strand, to a point further north, near the Cavell Monument. Finally will come the erection of the new Charing Cross Bridge.

Enough has, perhaps, been written to show that, not only is the Waterloo neighbourhood one which contains many features of interest but, what is, perhaps, of more concern to telephone men, it is one big with possibilities. It seems inevitable that the City will extend in its direction. It is possible that it may become the greatest commercial centre in London. The present business centre—the City—has many disadvantages. As regards position it is too far removed, for one thing, from Westminster, the civic centre. It is terribly congested. Its traffic has become so excessive that it blocks itself, and the economic advantages resulting from concentration in a small area have, to a large extent, disappeared. It is constantly seeking to expand by creeping north and west. Waterloo, on the other hand, is close to Westminster. It is comparatively free from congestion. It has abundant possibilities for expansion. It may, therefore, fairly be predicted, without excessive exercise of imagination, that, when Waterloo Bridge has been reconstructed and widened, when a new bridge for road traffic has been thrown across the river at Charing Cross, when Charing Cross station has been moved to Waterloo, when an embankment comparable with that on the Middlesex side has been built on the Surrey side of the Thames, the neighbourhood will become a great business centre, perhaps the greatest business centre in London.

C. W. M.

BERMONDSEY AUTOMATIC EXCHANGE.

THE opening of a new automatic exchange at Bermondsey marks a further important step in the conversion of the London Telephone Area consisting of over 100 exchanges to automatic working. The Exchange has an initial capacity of 2,600 lines, and will considerably relieve the heavily loaded manually operated exchanges serving the district. The equipment has been supplied and installed by Standard Telephones & Cables Ltd., in accordance with specifications prepared by the General Post Office. It is typical of the Step-by-Step Register Translator System adopted by the G.P.O. for London, and is similar to that which was put into operation recently at Sloane Exchange.

A subscriber at Bermondsey can now obtain any subscriber on any exchange within ten miles of Oxford Circus without speaking to an operator. To do this the subscriber simply dials the first three letters of the exchange name followed by the number of the wanted subscriber on that exchange.

A call from Bermondsey to another Automatic Exchange in the London area, such as Sloane, is now put through without the assistance of any operator, even though there is no direct line between Sloane and Bermondsey and the call has consequently to pass through an intermediate exchange.

The chief agent in this process, the Register Translator, translates the first three letters of the exchange name (SLO) into

the code necessary for sending the call through the various stages to the wanted exchange. It then registers the four digits of the subscriber's number so that when it has directed the call as far as the wanted exchange, it can guide it further to the particular line required.

Having seen the call to its destination it frees itself from the line and is ready to pilot another call through. If the wanted subscriber is at Bermondsey, the process is just the same and just as quick, but it takes place entirely in the one building.

In a call from Bermondsey to a manually operated exchange, the process appears just the same to the calling subscriber, but in this case the Register Translator directs the call to an operator at the distant exchange. The required number appears as a group of illuminated figures on a screen in front of this operator and she completes the call without speaking on the line.

Although automatic, Bermondsey has 18 operators' positions, 5 of these are required to deal with calls incoming from manual exchanges with direct lines to Bermondsey. The operator at the manual exchange gives the order to one of these special " Cordless B " operators who, by means of a set of ten press button switches, directs the call through the automatic apparatus to the required subscriber.

Other operators are required to deal with calls from coin boxes, to give assistance to subscribers in trouble (to obtain an operator it is only necessary to dial 0), to offer trunk calls to subscribers already engaged on another call, and for other special work.

Like other automatic exchanges in London, Bermondsey Exchange is equipped with special machines called " Routiners " which periodically apply tests automatically to the important switches in the exchange and give warning to the maintenance staff if any switch is not functioning correctly.

FRANK TALBOT WADLEY.

THE Telegraph Service was the poorer on Sept. 14 last, when Mr. Wadley, the Assistant Controller, Foreign Central Telegraph Office retired upon reaching the age-limit. He was appointed as a telegraphist in February 1884, and took up the position of 3rd-Class Clerk in the Controller's Office in 1894, 2nd in 1903, 1st in 1910, Principal Clerk in 1914 and Assistant Controller in February, 1918.

Mr. Wadley had had a lengthy experience in the administration of the Anglo-foreign telegraph communications before he was appointed Assistant Controller of that important portion of the British Telegraph Service, the importance of which, indeed, had never been fully realised until the outbreak of war.

Mr. Wadley took up the reins of control of the Cable Room at the fag-end of that terrible struggle and at a time of crisis in the history of the Cable Room itself when, such were the then conditions, that only a man with goodwill at his heart and graciousness in his spirit could have succeeded.

That was over ten years ago, and there are few, surely, who have not recognised by this time how real has been his regard for the welfare of the staff, how much he has really made himself " one of us," once the necessary official restraint has been removed and the cricket field, the concert or dance room have been the meeting place. This desideratum has been aided in no small measure by the unaffected geniality of Mrs. Wadley, herself an old C.T.O. telephonist.

As a disciplinarian of the martinet type, Mr. Wadley was a failure, and for this *Deo gratias*. He had other and successful methods, no matter how he tried to disguise them by striking the table emphatically !

" When all men praise thee, beware ! " says the proverb. If this be true then Mr. Wadley's case must be the one great exception that proves the rule. J. J. T.

A TRAFFIC OFFICER'S DREAM.

IN an article entitled " Economics : Fantastic and Otherwise," on pages 277-8 of the September *Telegraph and Telephone Journal*, the writer, when dealing with the question of adjustment of staff to traffic, refers to the dream of a Traffic Officer. It might be of interest shortly to describe the main lines along which his dreams —there were three of them—ran.

He saw in his first dream a gas meter from which led many pipes—each to an " A " position. At each position the current from the position register lamp actuated a valve that permitted exactly one cubic inch—or exactly one " something "—of gas to escape. The gas company's meter-reader saw to the rest.

Again he dreamt, and this time saw the steel balls, referred to in the article, rolling down inclined grooves at the end of each of which there was a little gate, so constructed that only one ball could get out at each opening, and lo ! whenever a position register lamp lit up, then did one of the little gates open, and the ball thus released fell on to a travelling platform, like unto a miniature bicycle chain, which carried it against the spoke of a wheel which turned a counter round.

Again he dreamt, and this time, in a circus, he saw an acrobat who held a platter over his head, and on this platter there stood another acrobat who likewise held a platter over *his* head, and on this platter stood a third acrobat. Now, when the first acrobat turned round, the other two, of necessity and without volition on their own part, were also turned. Again, whilst the first was turning once completely round, the second also turned completely round upon *his* platter, and this time by his own volition, whereupon it was seen that the top man had turned twice though he himself had made no effort and each of his companions had but made the effort of one turn each.

The acrobats and the circus were dissolved and in their place was seen a spindle with independently moving wheels, yet with each coupled to his neighbour by a spring, and the last wheel was fixed. Between each pair of wheels a ratchet was, and it, when raised, allowed an angular movement of 18 degrees between the two wheels adjacent to it. The first wheel was turned by a winder until each wheel had travelled as far as its coupling spring permitted, and then could turn no further unless and until one or more of the ratchets moved—which indeed happened whenever the register lamp of a position lit up, and as each movement was made, so did an electric winder turn the first wheel to compensate for the separate amounts of turnings of the several wheels, and counted as it turned.

And then the Traffic Officer awoke, for in his ears there sounded the words : " Lo ! these wheels and ratchets are not STANDARD PARTS, nor do they appear in the great Book called RATE."

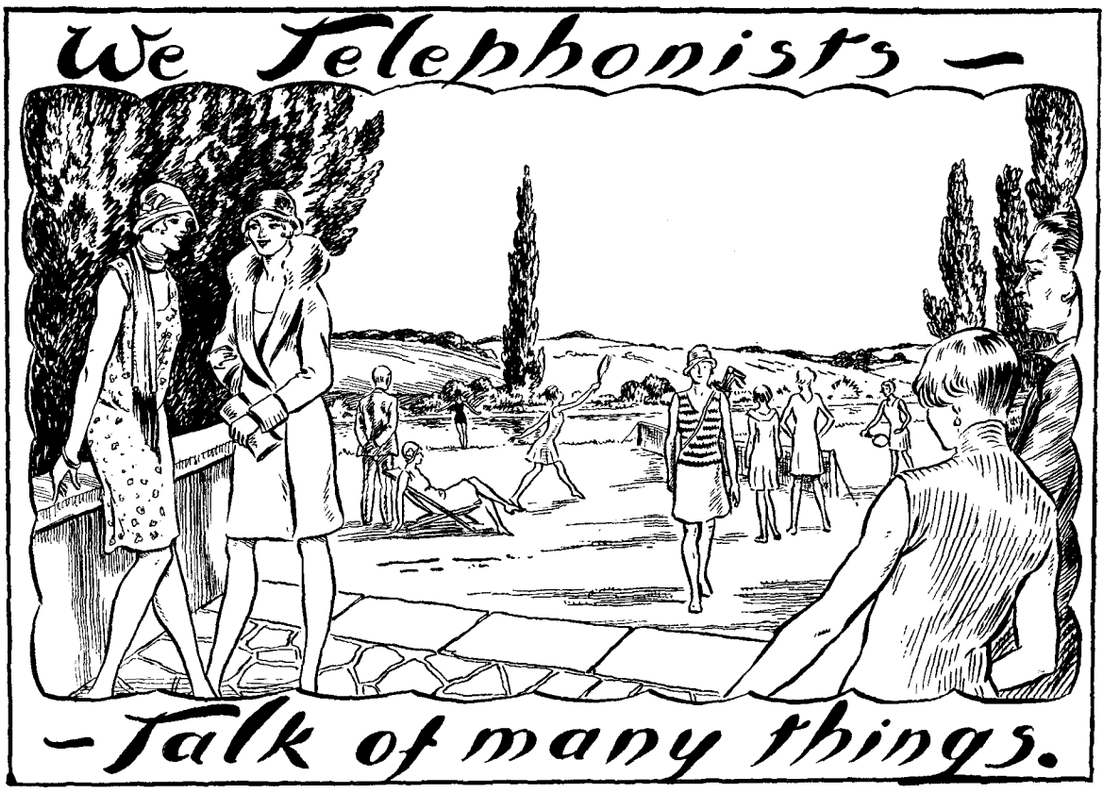
And he went on his way sorrowful and dejected !

C. D. I.

DINNER TO N. CURTIS-BENNETT, ESQ., C.V.O.

IN response to a generally felt desire in the Civil Service, arrangements have been made to entertain Mr. N. Curtis-Bennett to dinner in recognition of all that he has done during recent years to promote the welfare of his fellow Civil Servants, especially in connexion with the promotion and development of the sports movement. For this purpose the following committee, which is representative of the whole of the Civil Service, has been formed : Mr. E. E. Beare, C.B.E. (Chairman), Mr. J. W. Bowen, Mr. C. Briggs, O.B.E., Mr. W. J. Brown, Mr. G. H. Craddock, Sir Herbert J. Creedy, K.C.B., K.C.V.O., Capt. G. Seymour Dixon, O.B.E., Miss A. E. Gardner, O.B.E., Mr. B. Jewell, O.B.E., Hon. Dame Maude A. Lawrence, D.B.E., Mr. Lachlan Maclean, O.B.E., Mr. Geo. Middleton, J.P., Mr. A. F. Pound, Dr. G. F. Herbert Smith, D.Sc. (Honorary Secretary-Treasurer), and Miss D. Smyth. Such an all-round and representative committee is probably unparalleled in the history of the British Civil Service. Moreover, Sir Warren Fisher, G.C.B., G.C.V.O., Secretary to the Treasury, who had expressed his wish to be present at the dinner, has consented to take the Chair.

The Dinner is to take place in the Victoria Hall, Hotel Cecil, on Nov. 27. at 7.30 for 8 p.m., the price of the tickets being 8*s*. 6*d*.



Hats.

FAR be it from me to say anything which would tend to deprive a fellow creature of the means of earning a living. I might not be so particular had I not to earn one myself. I can claim that in the matter of work I am unselfish—almost to the point of self-denial—and I should not like to feel that I am creating a condition whereby others were forced to cease work whilst I was forced to continue. Probably I bear a share of responsibility for the unemployment which exists in this present complex social system, but it is my misfortune rather than my fault. There is, of course, a great deal of unnecessary work done, and it is arguable whether it would *not* be better to do no work rather than to do work which is unnecessary. At best, however, it is a pitiable alternative to unemployment.

And this brings the matter of hats to a head. Hats, maybe, are useful to conceal a yawn—as you will doubtless have discovered by now—or for taking up collections or *for fanning hot tea (so I have heard), but of what* manner of use are they otherwise? The saying "As mad as a hatter" is well known, and its truth is demonstrable. If hatters were not mad they would not make hats nor would they ever designate as hats those things which they do make. The very fact that their madness was recognised originally, and has been accepted for all time, indicates the general attitude of mind towards hatters and their works.

It is probable that the first man to wear a hat did so with the idea of demonstrating that he was superior to his fellows. They, on their part, at once supposed that he was possessed of a devil and venerated him accordingly. Gradually each man came to regard himself as rather better than his neighbour and everyone took to wearing a hat. Then in the course of time, and with the customary mutation of ideas which marks progress, it was the man without a hat who came to be regarded as possessed of a devil. But co-incidentally, devils had ceased to command the same degree of respect. Thus, although in normal course the man without a hat should have come to be regarded as a superior being, the decline in the respect for devils robbed him of his due of veneration, and nowadays he is merely tolerated.

Now this is all quite wrong and very sad. It is not as though one could find anything to say in favour of wearing hats. Actually there is no sense in piling an erection of felt or straw or other material on the head when nature has provided a suitable covering which can be dyed or waved if necessary to meet current fashion. Most of us decline to wear a hat whilst on holiday. So used do we become to a hatless state that, during the first few days after our return to civilisation and hats, we invariably leave our headgear on the luggage rack of the morning train or on a teashop peg.

The time is past when to be hatless is to be witless, and therefore, I say, with all respect to and sympathy for the hatters, let us abolish hats. Then and only thus shall the hatters be set free from the awful stigma which has saddened their lives. They ought to be pleased, the barbers will rejoice and the housing problem for birds will be solved. Strictly *entre nous, sotto voce* and *sub rosa*—mustn't it be awful to be as mad as a hatter!

PERCY FLAGE.

DEAR EDITRESS,

It is with deep regret we note that we have not yet received any "Further Statistics" as promised to us by our "Central" colleague "D.D." We are of unanimous opinion that she fully deserves to be allowed to add the initials "I.D." to her name, as the information imparted by her in the previous "Further Statistics" was well worth assimilating, and has, undoubtedly, served to remove any "Creeping Depression" lurking in the region of our minds.

Why this sudden and lengthy silence? Has our friend received a shock by coming "face to face" with a few dials whilst making her investigations? Perchance she has again gone "Mountain" climbing in the "Boots" which caused annoyance to Dean Inge. We trust she will have rubber soles put on them the next time she ventures near the dome of St. Paul's. Can it be that she has retired, upon the discovery of her "Last Gem?" But listen! rumour has it that she was recently seen in the warm and misty clime of the C.C.I. Riviera. Has she gone there to trace the truant "No displays" who always take their leave "Out of course," defying alike the vigilance of engineers and supervisors.

Further "leaves" and "Statistics" from "D.D." are eagerly awaited.

L. M. C. (City Exchange).

Over the Dining Table.

A dining-room table is a peculiar subject to write about, yet methinks there is one worthy of such mention in these pages.

This particular table is not remarkable by its construction, or its position in the Hop Exchange Refreshment Club, but by the senior telephonist members who meet around it each day during the luncheon period, and the discussions that take place there.

Obscure table, in an obscure dining-room, in an obscure corner of this great City of London, you play your part in the scheme of things as well as any high-born official, for in what other place could one meet so successfully to join in the mood of one's colleagues. And such moods, and such arguments—sport, literature, the topics of the day, the latest play and numerous other subjects are debated upon. To-day an affair of State was discussed with such detail and frankness that would shame any debate in the House of Parliament. Yesterday there was a funny story told, the table was in hilarious mood. To-morrow someone may be in trouble, there will be a call for sympathy and it will not be in vain, or perhaps some scandal to which even the most well-meaning ever lend an ear. Sometimes individuals are discussed, and if such discussions were broadcast, many there are who would for ever after walk in high places, others would shrink through the meanest cracks, for have I not previously inferred that subjects are met with frankness.

There are those who prefer the oak gate-legged table in their own comfortably furnished homes to the ordinary common deal table of the work-a-day world, but even "as the venomous toad, there is yet a bright jewel in its head."

F. D. BREENS.

Competition Results.

The winning sketch in connexion with the "heading" competition is that submitted by Mr. T. R. Fletcher, General Staff Section, Cornwall House. The prize of half-a-guinea has therefore been forwarded to him. The new design appears at the head of these notes.

Of the other sketches submitted, the three best were sent in by the following, and as a consolation prize, the *Journal* will be sent free to each of these competitors for a year.

They are congratulated on the excellence of their work :—

Miss D. M. Dibben (Park).

Mr. V. Bowles,
Buildings Section,
St. Bride Street.

Mr. M. H. Rees,
Post Office Engineering Department,
Plymouth.

Contributions to this column should be addressed THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

CORRESPONDENCE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—This summer I was fortunate in being able to visit the United States, and whilst in New York to see something of the working of the American telephone service. I thought the following impressions might be of some interest to your readers.

New York certainly does impress the stranger by the vast size of its buildings, and perhaps there was some excuse for that American guide whom I overheard telling a party of simple British visitors that "This is the biggest, and that is the largest, and there is the richest, &c., in the world."

The buildings of the New York Telephone Co., by their gigantic size and appearance, and thoroughly up-to-date appointments, can claim to be a true part of that big and enterprising city.

I will not attempt to give more than a passing impression of my visit to the American and New York Telephone and Telegraph Companies. One of the first impressions I received was that the Americans appear to take their business very seriously; they regard the Telephone Company as a great public service—indeed, the phrase "Public Service" was frequently on their lips. We on this side of the Atlantic are rather more reticent in the way we use the term; they, most probably, have been influenced by the virile teaching of their own philosopher Emerson, and consequently clearly recognise their very valuable part and worth in the world of business. It would be interesting to ascertain what sort of Press they have. The difference between us and them appears to be this, that while the Americans regard their Telephone Company as a great public service, the company seeing to this, we in this country are too prone to accept the often misinformed, and ill-timed criticism of a certain section of the Press. On the principle that if you will only tell a man a sufficient number of times that he is thoroughly inefficient he may come to believe you, so a constant, carping, misinformed criticism may tend to affect the psychology of a great public service.

Their striking literature, "Pamphlets of Explanation," "History of the Telephone," "Work Done," "Developments," &c., persuade the public that the telephone is a vital necessity, as a consequence the company are entitled to the esteem they arouse, by the judicious advertising of an efficient system.

I would add a further word as to their knowledge of the psychology of advertisement by environment. To realise this one must pay a visit to their head office in West Street. The entrance hall with its striking decorations, colours, lights, and remarkable series of paintings, all suggest the importance of the telephonic method of communication. Nor must one forget the splendid hall in which contracts are arranged, if in one way only we might with advantage follow their example and arrange separate tables, fitted with every requirement, at which both representative and inquirer could sit and discuss apparatus, rates, agreements, &c. The question of rates cannot be gone into here, but to take one aspect of the question, I think the subscribers in this country should know that there is an installation charge made for the telephone in America. In England it is installed free of charge; certainly English subscribers do not always appreciate this.

In closing, I must express my appreciation of the kindness and courtesy shown me by the gentlemen who conducted me through the exchanges and the various offices; also to mention the keen pleasure I experienced when my first call was made across the Atlantic, and I conversed with a friend on the London Wall Exchange—the call was due to their courtesy, another piece of evidence that one was not among officials, but friends.

In some ways they may have something to teach us, and while it would be invidious to suggest which service reaches the higher level, one might enquire whether we on this side are doing all we could to recommend to the public the good qualities and sound organisation of the Telephone Service in London.—Yours faithfully,

City Contract Office, J. W. MARSHALL.
Queen Victoria Street, E.C.4.

LONDON TELEPHONE SERVICE NOTES.

Telephonists' Society.

THE meetings will again be held in the hall of the City Y.M.C.A., in Aldersgate Street, and the session will commence on Friday, Oct. 5, when this year's President, Mr. Horace Dine, will give his address on "Something to look forward to." A very apt title if taken also in connexion with the programme for the session. An innovation this year is the experiment of serving tea to the early arrivals as an encouragement to friendly chats before the business commences.

The annual whist drive will be held at Caxton House Restaurant on Friday, Oct 25, and here again the early arrivals will find themselves catered for in the form of a photograph-judging competition. Several well-known Service people have promised to furnish photographs of themselves when not older than six years of age and the prize will be won by the competitor who names the greatest number. Other snappy competitions will be decided during the evening.

An interesting debate will take place on Friday, Nov. 2, when Miss Naomi Budden (Mrs. Herbert), lately a telephonist, will affirm that "The work of a telephonist fits her to assume domestic responsibility." The opposite view will be expressed by Mr. R. C. Atkins, better known to the readers of the *Journal* as "Percy Flage."

On Friday, Nov. 23, the Society is to be entertained by Mr. F. G. C. Baldwin, who will lecture on "The Early Development of Telephone Switching," illustrated with lantern slides.

The annual dance will be held as usual at the Bishopsgate Institute on Saturday, Jan. 26, and on Friday, Feb. 1, Captain G. Reid, R.A.F., will give a lantern lecture.

The Competition Night and distribution of prizes will be on Mar. 1.

The session will close with the production of a new play by Miss J. McMillan, which will be performed on two nights, April 4 and 5, at the King George's Hall.

* * * *

Imperial Service Medal.

An interesting event took place in the L.T.S. Conference Room at Cornwall House on Aug. 29, when Mr. W. A. Valentine, C.B.E., presented the Imperial Service Medal to Miss E. E. Waghorn, in the presence of a large number of her colleagues.

Miss Waghorn had retired on reaching the age of 60 years on June 7 last, having completed 42 years' service as a Sorting Assistant, 26 years of which were passed in the Money Order Department and 16 in the London Telephone Service.

Mr. Valentine said that the event was unique in the history of the L.T.S., owing, no doubt, to the comparative youth of the L.T.S. as a Government Department. He paid a warm tribute to Miss Waghorn's long and devoted service and said that the office was identified with her in the honour she had received. He asked her to accept the congratulations of her colleagues with their best wishes for her future.

Miss Waghorn, in reply, said that the presentation came as a great surprise to her and that she would regard the medal as one of her cherished possessions. It would remind her of the many pleasant years she had spent in the Controller's Office.

One of Miss Waghorn's Supervisors added a spontaneous tribute to Miss Waghorn's unfailing cheerfulness. The section, she said, was sorry to lose such a cheerful and helpful colleague.

* * * *

Contract Branch Notes.

The results obtained by the Contract Branch during the month of August represented a net gain of 3,081 stations as compared with 2,683 stations in the corresponding month of last year.

Obituary.—The Staff learnt with regret that Mr. G. E. Bugler, a Contract Officer, Class II, of the City Contract Office, passed away on Sept. 6 at the early age of 44. He had been away from the Office since January last, and had been superannuated a few weeks before his death. He was a conscientious worker, and a highly respected member of the staff and will be sorely missed.

A cheque was forwarded to his widow as a result of a collection from his colleagues, and the Contract Branch was represented at the funeral by Mr. A. E. Culpin, of the City Contract Office.

Cricket.—The batting averages and bowling analysis of the Contracts cricket team for the successful season just closed are given below.

Cowdray just tops the batting averages, thanks to a vigorous knock of 53, but Hodgkiss is the only man to exceed 100 runs in League games, and he has proved himself to be an ideal opening batsman.

Pearkes has had to bear the brunt of the bowling and his 15 wickets, coupled with several useful scores with the bat, reflects a good season's work.

Another improving player is Goodger, who has made rapid progress during the year and promises to be even better.

BATTING AVERAGES.

Name.	No. of Innings.	Times not Out.	Most in an Innings.	Total Runs.	Average Runs per Innings.
Mr. Cowdray ...	5	—	53	96	19.2
„ Hodgkiss ...	6	—	36	114	19.0
„ Dickinson ...	4	—	24	73	18.25
„ Pearkes ...	5	1	29	64	16.0
„ Oliver	6	2	20	64	16.0
„ Goodger ...	6	—	37	75	12.5
„ Griffiths ...	5	—	21	40	8.0
„ Wilson ...	4	—	13	28	7.0
„ West	5	—	11	19	3.8
„ Sharp	3	1	1	1	0.5

The following also completed 2 innings each :—

Mr. Holdstock, 52 runs ; Mr. Barnsley, 26 runs.
Mr. Evans, 19 runs ; Mr. King, 4 runs ; Mr. Staples, no runs.

BOWLING ANALYSIS.

Name.	Overs.	Maidens.	Runs.	Wickets.	Average per Wicket.
Mr. Dickinson ...	15.1	3	39	7	5.57
„ Pearkes ...	24.3	8	86	15	5.73
„ Holdstock ...	13.0	3	21	3	7.00
„ Oliver	6.2	1	15	2	7.5
„ Cowdray ...	16.0	2	48	5	9.6
„ Wilson	11.0	2	40	2	20.00
„ Griffiths ...	8.0	1	28	1	28.00
„ Hodgkiss ...	23.0	6	44	—	—
„ Staples... ...	4.0	—	16	—	—

* * * *

Football.

There was a very good turn out for the first practice game of the season which took place on the Chiswick ground on Tuesday, Sept. 11. A match was played between the Stripes, consisting of the probable first team forwards, and the Whites, who had most of last year's defenders. The Stripes, who were the better opportunists, won by 3 goals to 1.

Several of the new players were very impressive, and it would appear that the prospects for the coming season are very good.

The programme of league games commences on Sept. 29, and the list of matches to the end of October is as follows :—

Sept. 29. Ministry of Health, at Chiswick.
Oct. 6. Board of Education, at Chiswick.
„ 13. Land Registry, at Osterley Park.
„ 20. Taxes, at Osterley Park.
„ 27. Match to be arranged.

* * * *

Bowls.

Four members of the L.T.S. Bowling Club gained the distinction of winning the London Area Civil Service Rink Competition—they were Messrs. Cleland (skip.), Heard, Hutchison and Weaire. The team travelled west to Cardiff, in August, and lost to the West of England. Some consolation came their way, however, for Cleland and Heard played for the English Civil Service against Scotland and Wales, and Hutchison played for Scotland. All four played in representative games against county teams.

* * * *

Swimming.

At the combined Central and City Exchanges Gala, the following were the principal results :—

E.C. District Challenge Cup : Team Race.

Clerkenwell Exchange 1
Central Exchange 2
City Exchange 3

L.T.S. Plunging Championship :

Miss Bailey (Victoria) ... ... 57 ft. 0 ins.
Miss Brain (Royal) ... ... 56 ft. 6 ins.
Miss Mason (Avenue) ... ... 54 ft. 0 ins.

Invitation Team Race :

Gerrard Exchange... 1
Trunk Exchange 2
Victoria Exchange 3

GLASGOW TELEPHONE NOTES.

THE saying that if we " take care of the pence the pounds will take care of themselves " is well exemplified in the annual amount contributed by the Telephone Staff to the National Savings Scheme.

For the year ending Aug. 31, 1928, the sum collected exceeded £3,650, and as this was subscribed in small sums it will be clear that the Glasgow Staff have developed the habit of thriftiness to a marked degree.

This opportunity is taken also to thank all those who have so willingly organised and carried out the duties involved. These call for personal effort and enthusiasm on the part of all concerned. The success of the scheme is ample testimony to the quality of the work. That this may continue is the sincere wish of everyone.

Ode to a Multi-Coin Box.

This is the Coin-Box that Hall built.

This is Button B of the Coin-Box that Hall built.

This is the Coin that wouldn't come out of the Coin-Box that Hall built.

This is the Caller, afflicted with gout,
Who cursed the Coin that wouldn't come out,
When he pressed Button B of the Coin-Box that Hall built.

This is the Policeman, strong and stout,
Who said " Now, what's all this about ? "
And arrested the Caller, afflicted with gout,
Who cursed the Coin that wouldn't come out
When he pressed Button B of the Coin-Box that Hall built.

This is the Prison, all comforts without,
Wherein a sufferer from gout
(Whose sanity they begin to doubt),
Still raves of a Coin that would not come out
Though he's pressed Button B of the Coin-Box that Hall built.

[With apologies to the author of " The House that Jerry Built."]

A. E. HIGGENS.

Extracts from Complaints.

" We can be wrung up, but cannot get into communication with the exchange." (We should be very much obliged if they would.)

" At this stage I was subjected to a lot of filthy epitaphs : " (*De mortuis nil nisi bonum*).

(From a typed letter) : " I note your remarks."

A. E. H.

The Business Man's Dream.

I dreamt that I dwelt in a land far away
Where the telephone girl o'er the world held sway.
She never " chipped " back—for that led to strife—
Was the joy and the pride of the business man's life.

* * * *

If *he* made a mistake—no matter what kind—
She'd rectify that and the right number find.
She never once said that he " didn't correct " her,
But " swallowed " it all. He longed to protect her
From official rebuke that his error might cause,
So on using the 'phone he made a slight pause
Lest he vent on this Angel his feelings so ruffled
By everyone else. Her treatment so baffled
Each stockbroker, merchant and business men all,
That to soothe their bad temper they made a 'phone call.
No matter what happened the telephone girl
Could deal with the case. Great the price of this " pearl."
The " time " was exact—never less, never more—
Business firms ordered 'phones and extensions galore.
The " Contract Department " worked hard day and night
To please every client was their great delight.

* * * *

And I also dreamt which pleased me the most—
That all the " M.P.s" never counting the cost,
Said the telephone girl wherever she went,
Was worthy an increase two hundred per cent.
On her annual wages. To save time by months,
This bill passed its reading three times all at once.

* * * *

I woke from this dream of a system perfected
And lifted my 'phone. IT WAS QUITE DISCONNECTED ! !

M. L. TULLOCH.

After Relaxation—Work.

" Who first invented work, and bound the free
And holiday-rejoicing spirit down
To the ever haunting importunity
Of business in the green fields, and the town—
To plough, loom, anvil, spade—and (oh, most sad !)
To that dry drudgery at the desk's dead wood ?
Who, but the Being unblest, alien from good,
Sabbathless Satan ! " (*Lamb*).

" Why should the sense of duty be dull, leaden, soul-depressing and fall upon one like a weight and a burden ? " (*O. Henry*).

" Not for leisurely contemplation of thyself art thou here. Thy work alone determines thy worth." (*Fichte*).

" Why seekest thou rest, since thou art born to labour ? " (*A. Kempis*).

" Give me leave to allow myself no respite from labour." (*Tertullus*).

" All books and no business makes Jack a jack-in-the-box ; with springs and wheels in his head—all play and no work makes Jack a jack-ass, with bosh in his skull. The right prescription for him is play when he really needs it, and work whether he needs it or not ; for that dose makes Jack a cracker-jack." (*Gorgon Graham*).

" The only happiness a brave man ever troubled himself with asking much about was, happiness enough to get his work done. " I can't work ! " that was the burden of all wise complaining among men. Happiness, unhappiness, all that was the wages thou hadst in sustaining thyself hitherward : and now thy work, where is thy work ? Swift, out with it, let us see thy work ! " (*Carlyle*).

" It is part of our *delight* to measure our wages with the merit of our work, and to *admire* the close proportion." (*Dante*).

" In labour is medicine for the hearts of men." (*R. Oakeshott*).

" God has made work the sentinel of virtue." (*Napoleon*).

" J. L."

THE POST OFFICE TELEPHONE AND TELEGRAPH SOCIETY OF LONDON.

1928-29 SESSION.

THE opening meeting of the Session will be held on Monday, Oct. 15, at the Institution of Electrical Engineers, Victoria Embankment, W.C.2., at 5.30 p.m., when F. Gill, Esq., O.B.E., Past President, I.E.E. (Vice-President International Telephone and Telegraph Corporation), will give an address on " International Telephony."

In the absence of the Chairman, J. Stuart Jones, Esq., M.B.E., on official business in America, Col. T. F. Purves, O.B.E., has kindly consented to preside at this meeting.

Members may introduce visitors, and members of the Institution of Post Office Electrical Engineers, and of the London Telephonists' Society may attend the meeting.

Tea and light refreshments will be provided in a room adjoining the Lecture Hall, from 5.0 p.m. to 5.30 p.m.

Other papers and addresses during the session are as follow :—

1928. *Monday.*		
Nov. 19	" Changes at the Central Telegraph Office during the last Fifteen Years."	Mr. J. Stuart Jones, M.B.E. (Controller, C.T.O.)
Dec. 3.	" The London Automatic System."	Mr. M. C. Pink (Assistant Controller, L.T.S.).
1929.		
Jan. 21.	" Impressions of the American Telegraph Systems."	Mr. G. T. Archibald (Inspector, T. & T. Traffic, Secretary's Office).
Feb. 18.	" Commission Control of Public Utility Services."	Mr. A. J. Waldegrave (Assistant Acct.-General G.P.O.).
Mar. 18.	" Broadcasting Developments."	Captain P. P. Eckersley, M.I.E.E. (Chief Engineer, The British Broadcasting Corporation).
April 15.	" The Telegraph Service in 1950."	Mr. J. J. Tyrrell (late C.T.O.).

Applications for membership should be addressed to the Local Agent, or to the Honorary Secretary of the Society, Mr. D. H. Thomson, Secretary's Office, G.P.O., North, E.C.1.

WHY NOT ADVERTISE THE TELEPHONE?

THE writer of a letter in the May issue of this *Journal* advocates advertising the telephone service with a view to encouraging the interest of the public, by initiating them into some of the mysteries behind the scenes.

The suggestions contained in the letter appear to be worthy of serious consideration. They constitute, in short, an appeal with a psychological aspect, as nothing is calculated to interest mere humans more than to know " how it works."

If, as Sir Henry Bunbury has warned us, the time may come when the profit from the telephones threatens to turn into a deficit, it would appear that something will have to be done to create more public interest in the business. There seems to be only one way of doing this, and that is by travelling along the same road as that taken by all progressive business firms, and advertise. There should be no half measures adopted, however, but the matter should be tackled in a thorough and up-to-date manner.

The advertising idea should be carried much further than by furnishing subscribers with details of the working of the system, and if adopted at all, every means by which publicity could be given to the service should be used. Advertisements should be framed with definite objects in view, and these could be divided into three categories with the idea of :—

(1) Increasing development.

(2) Creating the interest of the public in the working of the telephone system.

(3) Encouraging the growth of the telephone habit.

As regards item (1), the Telephone Development Association is already doing good work in this direction, but more still could be done by the Department. Why not have periodical house-to-house canvassing, especially to houses which have been scheduled as " telephone houses " during the course of block surveys—or at least these houses could be circularised. It might be necessary, of course, to regulate intensive canvassing in areas where the equipment is approaching exhaustion, but this should not be a difficult matter with efficient co-operation between the local Contract, Traffic and Engineering departments. Another method of encouraging some would-be subscribers might be by permitting them to purchase their instruments, and allowing a corresponding reduction in rental. These instruments might be supplied in various shapes and with decorative designs to suit the taste of purchasers. A display of such instruments could be made at district offices and should be visible, where possible, from the street in a similar manner to displays of electrical equipment on view at the offices of local electric lighting companies. These displays would afford a certain amount of publicity and would be an advertisement in themselves, especially if accompanied by prominent and catchily-worded notices regarding the service.

Advertisements under category No. 2 would have a two-fold object, viz. that of disseminating information among existing subscribers regarding the activities of the service for which they pay, and that of gaining the interest of the general public, and so inducing more of its members to become subscribers. In other words, this type of advertisement would tend to popularise the telephone service. It might be said that technical details would bore instead of interest the public, but in these days of wireless broadcasting, almost every intelligent member of the community is more or less acquainted with a certain amount of electrical knowledge. In any case, the information supplied would need to be only of a simple technical nature, and should be carefully chosen having due regard to the object in view.

Subscribers, as a whole, are profoundly ignorant of, but are entitled to know, some of the details regarding the " make-up " of their telephone circuit. Rental would be paid far more willingly

if a subscriber knew for what he was paying besides the upkeep of the instrument at his house or office.

Public interest in the service would lead to a better understanding between subscribers and those who administer the service. Subscribers would have a better knowledge of what happens "at the other end," or at least of some of the equipment or operations involved. This knowledge would undoubtedly reduce the number of complaints and scurrilous talk, which tends to belittle the telephone service and to bring it into disrepute instead of, as it should be, into popular favour. A new feeling would be created and this in itself would help to increase development. Another effect of increased knowledge on the part of subscribers would be that it would help them to understand better the explanations offered to them by the traffic staff in reply to genuine complaints. This, and the reduction of complaints would relieve the local traffic staffs of an appreciable amount of unremunerative and unsatisfactory work.

The Glasgow Telephone district has given a lead as to one of the methods which might be adopted in order to impart information to subscribers and others. In the same issue of the *Journal* as quoted above, a short account was given under the heading of "Glasgow District Notes" of meetings held in that district during the winter months. At these meetings, which were well attended by subscribers, call office users, and potential subscribers, as well as exchange staffs, interesting lectures on the activities of the service and demonstrations of the working of the telephone system were given. This example might well be followed in other districts, especially in districts where automatic working has been, or is about to be introduced. The information and demonstrations given at the meetings could be supplemented by appropriately worded brochures issued, as suggested by the aforementioned correspondent, in a series. These could either be distributed at the meetings, sent out with subscribers' accounts, or could be placed on the public counters of post offices, in call office boxes, or anywhere where members of the public could help themselves, such as is done with underground railway and tramway guides. Slow motion films would provide an efficient and entertaining means of depicting the action of automatic apparatus during the progress of a call, and, no doubt, these could be provided at a comparatively reasonable cost. The films and projectors for showing them would probably cost less than the demonstration sets now exhibited in areas about to be converted to automatic working. Films of this type are extensively used in America, both for educational and advertising purposes.

By far the most important, from a revenue point of view, are advertisements under category No. 3. This has been placed last, however, because it is obviously necessary to induce the public to become subscribers before attempting to persuade them to adopt the telephone habit.

The equipment of an exchange is provided on a basis to cater for the average peak traffic load. This normally occurs during about one hour each day, the particular hour varying according to the business of the area served by an exchange and the class of subscriber's line predominating, i.e. business or residential. It is obvious, therefore, that a large amount of plant, including junctions, representing a considerable amount of money, is standing idle for the majority of hours each day. This is especially the case at automatic exchanges where switches replace telephonists on a large number of the calls dealt with. At manually operated exchanges the duties of the operating staff can be arranged so that the wastage is minimised to a certain extent. It is with the idea of providing traffic in order to make remunerative use of this idle plant that this class of advertisement should be framed.

It is an established fact that the increasing proportion of the residential class of line is having a depressing effect on the average day-calling rate per subscribers line throughout the country. The majority of calls from this class of line is originated outside the peak load hours, or what are commonly known as busy hours, of most exchanges. Any inducement, therefore, for a greater use of the telephone on the part of subscribers of the residential class, would be extremely beneficial from a revenue point of view by increasing the average calling rate per line without necessitating a corresponding increase of equipment, because in most cases the additional traffic would be effected during hours when plant would otherwise be standing idle. Such traffic would obviously be highly remunerative.

There are endless means by which publicity for the telephone service could be obtained. Advertisements should be published in the popular Press; on hoardings; and on the backs of the various forms sent to subscribers, such as the "DM" series—these are plain at present, and, therefore, good space wasted. The advertisements should consist of catchy slogans, cartoons or illustrations, depicting incidents where the use of the telephone might be an advantage. Why deliver the apparatus to new exchanges in "plain vans" as though it was on the hire purchase system? Why not label such vans "Apparatus for a new public telephone exchange at ———" and let the public know of the telephone activities in its area? With a similar idea in view, new telephone buildings in course of erection could be appropriately indicated. Even the large banking firms do not consider such a type of advertisement to be undignified. Publicity notices could be exhibited on linesmans' trucks or on the jointers' tents frequently seen in the streets. The slogan "Say it by telephone," which appeared on postmarks for a time was a step in the right direction. Why not broaden the scope for this and other slogans?

There is a rooted objection in conservative minds to the adoption by the Post Office of the advertisement methods of well-known business firms; why should such objection exist, however? Such firms are well known only because of their widespread and, in many cases, pleasing advertisements. A precedent has been created already by the advertisements inducing people to buy war saving certificates. Admittedly, advertising would entail setting aside annually part of the revenue obtained from the telephone service, but would not the results justify the expense? After all, the type of advertisements referred to are the fashion of the times, and the profit which would accrue therefrom would be for the benefit of the community as a whole.

As it is, the main publicity which the telephone service gets at the moment is through more or less derogatory articles in the Press when things go slightly wrong. This has the adverse effect to that which publicity should really have.

P. J. S.

GLOUCESTER: PRESENTATION TO MR. J. PIRIE.

REPRESENTATIVES from all sections of the local staffs assembled recently in the District Manager's Office, Gloucester, to bid farewell to Mr. J. Pirie, Assistant Traffic Superintendent, on his departure to take up an appointment as Traffic Superintendent, Class II, at Preston.

The District Manager (Mr. John H. Storrie, M.B.E.), supported by Messrs. R. S. Grosvenor (Traffic Supt.), W. J. Norman (Chief Clerk), W. Brodie (Contract Manager), J. B. Ryall (Sectional Engineer) and R. W. Slack (Head Postmaster of Gloucester), on behalf of the associated staffs, presented Mr. Pirie with tangible evidence of their esteem in the shape of an oak bureau.

He expressed his gratification that Mr. Pirie's sterling qualities, which had endeared him to all in the Gloucester District, had received recognition in promotion and extended a hearty wish that he would climb high in the service.

Feeling reference was made by Mr. Grosvenor, Mr. Ryall, Mr. Slack, and other speakers, to Mr. Pirie's thoroughness and his calmness in difficulty.

Sincerity was the keynote of all the speeches, and it was evident that the gathering felt keenly the parting with one who through the years had carved a niche for himself in their hearts.

Mr. Pirie, in returning thanks, alluded to the happy years he had spent on the Gloucester Staff and his sorrow at the severance of the connexion.

Mr. Pirie was also the recipient of an expanding suitcase from the staff at Gloucester Exchange, and a bookcase from the Exchange and Engineering Staffs at Cheltenham.

PRESENTATION TO MR. G. A. W. GREGORY, SOUTHAMPTON.

IT was a strange coincidence that the official date fixed for Mr. G. A. W. Gregory's promotion to Traffic Superintendent, Class II, Brighton, should fall on the anniversary of his transfer to the Southampton Office.

The Traffic and Contract Sections being housed in different premises to the Accounts Section for over eleven months of Mr. Gregory's period of service in Southampton, did not permit of his acquaintance with the majority of the staff, but all sections were fully represented in the District Manager's room on the morning of June 28 to join in the congratulations on his promotion, and to wish him every success in his new office.

The District Manager (Mr. O. G. Lee), in a brief speech, paid high testimony to Mr. Gregory's capabilities as a Traffic Officer, and voiced his personal regret at Mr. Gregory's departure, whilst he congratulated him on a well-deserved promotion. He asked, on behalf of the staff, Mr. Gregory's acceptance of a case of pipes and a fountain pen.

Mr. A. L. May (Traffic Superintendent, Class I) also spoke in high terms of Mr. Gregory's capabilities and personality.

Mr. Gregory suitably replied and expressed appreciation of the tangible gifts which would prove a constant reminder of a short but very pleasant period of service in Southampton.

PRESENTATION TO MR. G. D. BATEMAN.

To mark his promotion to Traffic Superintendent, Class II, Middlesborough, the presentation of a camera to Mr. G. D. Bateman, late Asst. Traffic Superintendent, took place on June 28. In making the presentation, Mr. F. J. Frost, Traffic Superintendent, Class I, spoke with sincere appreciation of Mr. Bateman's service in the Western District, and wished him every success and happiness in his new district.

Mr. Kay, Chief Clerk, and Mr. Jowett, Contract Manager, speaking on behalf of their respective departments, suitably endorsed Mr. Frost's remarks and good wishes.

PRESENTATION TO MR. J. R. CRAIG.

MR. J. R. CRAIG, Assistant Traffic Superintendent, Telephones, Canterbury, was recently the recipient of a handsome Jacobean oak writing bureau to mark the occasion of his promotion to the position of Traffic Superintendent, Class II, Scotland West. The gift was the result of the combined subscriptions of friends in the District Manager's, Sectional Engineers' and Postmasters' Offices, and in the telephone exchanges. The presentation was made on June 27 by Mr. S. W. McDougall, Traffic Superintendent, in the absence, on leave, of the District Manager. In the presence of a small gathering representative of the various staffs, Mr. McDougall voiced the high esteem in which Mr. Craig was held, both officially and socially, and expressed the keen regret felt on all hands at his departure. That regret was, however, tinged with pleasure at his promotion, and in the name of all concerned Mr. McDougall wished Mr. Craig every success, good health and happiness in his new field. Several members of the departments added their tributes of regard and good wishes, and after a graceful reply by Mr. Craig, the ceremony closed.

CIVIL SERVICE COMMISSION.

Forthcoming Examination:—**Male Assistant Superintendent of Traffic** (Class II) in the London Telephone Service and **Male Assistant Traffic Superintendent** in the Provinces, General Post Office (18-23, with extension for service in H.M. Forces); regulations and particulars are obtainable from the Secretary, Civil Service Commission, Burlington Gardens, London, W.1, together with the form on which application must be made. The latest date for the receipt of application forms is **25th October.**

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 284.)

1865 ... ... Marshall Lefferts eliminated the foot pedals from Humaston's perforator and introduced a friction drive.

Marcus constructed a powerful thermo-electric battery.

International Telegraph Union founded in Paris, the French Government being the prime movers. Twenty countries and states were represented, but Great Britain was not included.

1866, Feb. 1 ... British registration fee on all foreign and colonial letters reduced to fourpence, except those to, or passing through, France.

Pattern Post rates altered, intermediate rates for 12 and 20-oz. being introduced.

1866, June 30 *S.S. Great Eastern* left the River Medway with new Atlantic cable aboard.

1866, July 7 ... Shore end of new Atlantic cable laid down at Valentia.

1866, July 13... Shore end and main portion of new Atlantic cable spliced, and *S.S. Great Eastern*, assisted by the vessels *Medway* and *Albany* commenced paying out.

1866, July 27... *Great Eastern*, having laid 1,852 miles of cable, reached Newfoundland.

1866, July 28... American shore end and Atlantic cable spliced.

1866, Aug. 9 ... *Great Eastern* and *Medway* put to sea in search of the cable of 1865.

1866, Aug. 12 *Great Eastern* and *Medway* met the *Terrible* and the *Albany*. The latter had already grappled the cable and attached it to a buoy, but the chain broke and the cable sank again.

1866, Aug. 13 Mr. Canning suggested the three vessels should drag simultaneously for the cable. This was done and proved successful.

1866, Sept. 2... Atlantic cable of 1865 raised and repaired by *Great Eastern*, thus providing two communications between England and America.

1866, Sept. 2... *Great Eastern* signalled through the old cable, joined a spare length and started for Newfoundland.

1866, Sept. 8... *Great Eastern* reached Heart's Content, completed the cable and established communication with Valentia. Captain, Sir James Anderson; Engineer, Mr. Canning; Electricians, Sir William Thomson and Mr. Willoughby Smith. Mr. Varley was the electrician at Valentia.

William Thomson knighted for his work in connexion with the Atlantic cable.

Du Moncel discovered that an increase of pressure between two conductors in contact causes a diminution in the electrical resistance of the circuit of which they form a part.

Two Atlantic cables looped experimentally and signals received on a Thomson mirror galvanometer, the battery used consisting of a few drops of pure sulphuric acid in a silver thimble with a piece of zinc weighing 1½ grains.

E. A. Calahan positioned the typewheel in Humaston's perforator and altered the method of punching.

S. A. Varley introduced induced needles for Single Needle Telegraph apparatus.

Wilde invented an electro-magnetic machine.

S. A. Varley constructed the first self-exciting dynamo. Dr. Werner Siemens and Sir Charles Wheatstone discovered the principle independently and simultaneously.

Bernard Meyer devised a writing telegraph system.

First Anglo-German telegraph cable laid.

Sir W. Thomson suggested the construction of a diagram showing the variations in the thermo-electric properties of lead, copper, zinc, and iron. Professor P. G. Tait constructed the diagram.

Merchants of Alexandria asked for a direct cable between that place and Malta.

Select Committee of the House of Commons recommended a route to India alternative to that via Turkey.

Dr. Lardner and Edward B. Bright published their work on "The Electric Telegraph."

1867, Aug. 25 Prof. Michael Faraday died and was interred at Highgate.

1867, Oct. 1 ... Compulsory registration of letters containing coin extended to the Colonies.

Number of registered letters reached 3,000,000.

Sir William Thomson invented the syphon recorder, based on his mirror galvanometer.

Wilde, Ernst Siemens, and Wheatstone, working independently, suggested that the coil rotating between the electro-magnets of a magneto-electric machine might induce a current which, passed through the coils of the electro-magnet, might increase its magnetism and so lead to the induction of stronger currents.

Machines were constructed on this principle and named by Siemens dynamo-electric machines.

Ladd exhibited an electro-magnetic machine at the Paris Exhibition.

Kravogl constructed an electro-magnetic machine.

(Buergin, De Meritens, Guelcher, Marianini, Niaudet, Schuckert and Wallace constructed dynamo-electric machines of various types.)

Morse referred to Bright's "Bell" Sounder as the fastest manual telegraph.

Wheatstone introduced the centre line of feed holes into his perforated tape and used morse alphabet.

Newspapers desired to establish their own telegraph organisations but the telegraph companies objected.

Frank I. Scudamore suggested that the telegraphs of the United Kingdom should be taken over by the Government.

Electric light substituted for oil lamp at Dungeness lighthouse.

Travelling Post Offices made a separate branch.

English Money Order Office established at the Paris Exhibition.

Money Orders payable through recognised London banks.

1868 ... ... Royal E. House, of Binghampton, New York, invented and patented an apparatus called the "electro-phonetic telegraph."

J. B. Stearns, of Boston, devised the bridge system of working duplex, using condensers for compensation purposes.

1868, April 1... Bill introduced in House of Commons to enable the Postmaster-General to acquire, operate, and maintain electric telegraphs. A Committee was formed to work out the conditions of transfer.

1868, July 31... British Telegraph Act passed.

Telegraph Act gave Postmaster-General certain wayleave rights over railway systems.

Florida-Havana cable laid.

Telegraph Conference in Vienna. Arrangements made for establishing a Central Telegraph Bureau at Berne. Great Britain was not represented but adhered to the convention.

Ernst Siemens constructed a keyboard tape perforator using the morse alphabet.

Organ played at a distance by electric connexion.

Indo-European Telegraph Company formed, and route towards India constructed via Germany, Russia, and Persia.

Dr. von Stephan, of the North German Postal Confederation, suggested a Universal Postal Union. Swiss Government invited other administrations to meet at Berne to discuss the proposition.

Great Northern Telegraph Company's European system erected.

Post Office servants re-enfranchised.

Press Association established.

(*To be continued.*)

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CONTENTS.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LVIII.

MR. J. T. WHITELAW.

MR. J. T. WHITELAW, the subject of our sketch, was born in 1872, at Edinburgh, and in 1892 entered the service of the late National Telephone Company as a fitter. He was subsequently made Special Faults Inspector for Police, Fire Brigade and special circuits. With the exception of a short period in Manchester on special duty, Mr. Whitelaw remained in Glasgow until 1900, when he was appointed Local Manager at Falkirk; in 1902 further promotion came his way when he entered the ranks of the District Managers at Kirkcaldy, being subsequently transferred to Hamilton in 1904. From 1901-1910 he was actively responsible for systems of main line underground work and aerial cable construction.

Mr. Whitelaw remained at Hamilton until October, 1912, when he was transferred to Lincoln, where he opened 19 new exchanges in a little over two years.

During the war period Mr. Whitelaw was responsible for the first Air Raid Warning Scheme in respect of the Humber Command, and in July, 1915, on his promotion to Aberdeen (where he remained until March, 1920), he kept in close touch with the Naval forces. He was then transferred to Middlesbrough. Promotion to the District Managership of Rochdale followed in April, 1921, to that of Blackburn in 1923, and to Manchester, the largest provincial telephone district, in February, 1926.

Mr. Whitelaw has had what is probably the most varied career of any of the present District Managers, having been in charge of eight districts at various times. As a Scotsman and, in his younger days, a player, he is a "Soccer" enthusiast, and rarely misses a match during the season. His sturdy physique suggests that even at this date he would be a capable exponent of the game. Mr. Whitelaw has always cultivated cordial relations with the staff, as evinced by his interest in and attendance at all social functions promoted by them.

CONFERENCE OF THE TELEGRAPH UNION.

BRUSSELS, SEPTEMBER 10 TO 22, 1928.

THE normal Conference of the Telegraph Union is a rather tedious affair, in which such human interest as resides in the International Telegraph Regulations is spread out very thinly over the discussion of twelve or fifteen hundred amendments. As a relief from the monotony, a series of entertainments, known in Conference language as "distractions," is arranged. They consist, as a rule, of banquets four hours long, at which the Telegraph Service forms the main topic of conversation and of the speeches. At the end of a six weeks' Conference, the exhausted members have lost the power of distinguishing between work and distraction.

The Brussels Conference did not suffer from the usual drawbacks. It was a Conference specially convoked to deal with a single subject; and it had the great merit of being short. It is true that the traditional intervals between the distractions had to be dropped and that there were banquets on eight or nine successive days, but the end was always in sight.

Then the subject was one which had produced a sharp division of opinion in the Telegraph Union and had aroused interest out of doors. Thus we had the novel and pleasing spectacle of a Belgian girl representing the Press of the world at our meetings, and the equally novel but less pleasant sight of a deputation of commercial users of the international telegraphs.

The subject for discussion was a proposal to reduce the maximum length of a code word from ten letters to five letters. The idea behind it was that a jumble of ten letters cannot be memorised at a glance, and that telegraphists lose their way in these long groups, with the result that errors occur and free repetition is necessary. This was common ground, and so was the further postulate that if the telegraphist took the ten-letter group in two bites he would be less likely to make an error, and that he would more easily take the group in two parts, if it was already divided on the telegram form. The first objection comes here, namely the loss of line time caused by the transmission of an extra space for each code word; and a complication is introduced, because the advocates of the change did not propose that the new five-letter words should be merely the halves of the old ten-letter words, but wanted them to be free from the restriction as to pronounceability to which the old word had been subject. This restriction specified that the code word must be pronounceable according to the usage of one or more of eight western languages. Its adoption by the Conference of 1903, which first sanctioned artificial code words, showed a pathetic and groundless faith in the possession by code makers and counter clerks of a linguistic knowledge far beyond anything reached by the delegates themselves or any of their successors. The hope of the 1903 Conference was to secure artificial code words which should look like actual words. The artificial words as developed in practice looked like nothing on earth. They contained, however, a fair proportion of vowels and were better than mere jumbles of consonants, and the simple abandonment of the pronounceability rule, vague and unsatisfactory though this was, meant a definite worsening of the code word. It was nevertheless advocated by the five-letter partisans, whose logical minds were offended by a rule which could not be enforced strictly and with uniformity.

The advantage, for transmission, of two groups of five letters over one group of ten letters ceased to be obvious when the groups compared were no longer of the same kind; and the Paris Conference of 1925 decreed that statistics on this point and various others more or less connected with the subject should be collected and that a special inter-Conference Committee of 15 Administrations should examine them and report on the whole subject.

The Committee made a promising beginning by arranging to meet at the mountain resort of Cortina in the month of August, 1926, and spent the whole month there; but the rest of its work was less sound. It prepared a report advocating, by a majority of 14 to Great Britain, the adoption of five-letter code without restriction in place of ten-letter partly pronounceable code. The apparently solid majority was obtained by evading the question of the readjustment of tariffs. It was, of course, recognised that a change-over from ten-letter words to five-letter words would involve a reduction of the charge for code words, but on the actual figure of the reduction the opinions of the majority were much divided. A rate of 50% for the whole telegram would have meant a heavy loss of revenue, since no telegram consists entirely of code—the address and signature, for instance, are never code and the text often contains words and numbers in plain language mixed with code words. There was also the probability that the new rate would have to be applied, if not at the outset, then almost certainly later, to full-rate telegrams wholly in plain language.

The proportions of code and plain language vary greatly on different routes; and while the principle that the change-over should not be used to increase charges to the public was fully admitted, there was equal anxiety to ensure that it should not result in a loss to the service. A rate might be calculated which, on the traffic of the world as a whole, would give to the totality of Administrations and Companies and would extract from the conglomerated users the same sums as at present. The British code user would then pay more for his telegrams in order that the user of plain language in Poland, for example, might pay less; and the cable companies in Britain would conversely receive more while the Polish telegraph service would receive less.

The practical impossibility of finding a tariff which would not penalise large sections of the code-using public was at the root of the opposition of the British Post Office to the five-letter scheme, both at the Cortina meeting and at the Brussels Conference. The position was well understood by the commercial users both in this country and abroad, and they declared uncompromising opposition to the scheme unless the rate were fixed at half the present rate.

Nevertheless, of the 60 governments represented at the Conference, probably 40 or 45 would have voted for the five-letter scheme at some compromise rate not below 65% of the existing rate. The exact number of supporters is unknown, because the scheme did not reach the stage of a vote. The minority, comprising Great Britain, the Dominions and some of the South American countries, made it clear at the outset that it was unalterably opposed to the scheme, and it was strongly backed up by the representatives of the International Chamber of Commerce. The leaders of the majority recognised, after a week's discussion, that there was no available means of overcoming this opposition, and set themselves to find an acceptable compromise.

The compromise was reached after several days of debate, lasting sometimes from 9 a.m. to 7 p.m. and then interrupted only to prepare for a distraction. Its essential features are the retention of the ten-letter system slightly modified and the introduction of a five-letter scheme at a lower rate. The existing rates are retained for the ten-letter system. The rates adopted for the new class of telegrams are two-thirds of the present extra-European rates and three-quarters of the present European rates. The higher proportion in the European system is based on the greater risk of loss of revenue due to senders passing off plain language as five-letter code, the proportion of plain language to code in full-rate telegrams being much greater in the European system.

The five-letter words being subject to no restriction at all, except that they must not be plain language words in their ordinary sense, provide a much larger vocabulary than can be got from

words subject to restrictions as to occurrence of vowels. Whether this larger vocabulary plus the reduced rate will make these words more attractive to the public than the ten-letter word at existing rates will perhaps appear from the experience of the next few years. It is obvious, however, that with a rate of, say, 66 for five-letter words and a rate of 100 for ten-letter words, there would be a strong inducement to senders of all telegrams except very short ones to get their five-letter words passed in groups of ten letters at the 100 rate. The vague old rule about pronounceability was not enough to prevent this; and a mechanical rule was adopted, requiring the ten-letter word to contain at least three vowels of which at least one must be in each half. The pronounceability rule is dropped.

This requirement of three vowels is the one drawback to the scheme from the point of view of the user of existing codes. There are code words containing only two vowels which are perfectly pronounceable and therefore acceptable under the old system. They are not very numerous. A test covering 15,000 code words in actual telegrams showed only 75 which did not contain at least three vowels. Under the new rules those 75 words would be charged double, the other 14,925 words being unaffected. The users can, if it is convenient, replace these occasional words by others with more vowels; if not, they will have to pay double rate on one word in 200. That is not a heavy burden, and there are striking advantages on the other side, apart from the retention of the ten-letter system without any increase of rates. The three-vowel rule will simplify the construction of new codes and will provide a larger vocabulary; the abandonment of the pronounceability rule will remove a frequent source of trouble and dispute, and the reduction of the rate for telegrams in five-letter code is a definite gain for those who are astute enough to take advantage of it.

The Service does not gain so much. It gets rid of the troublesome pronounceability rule, but on the other hand there is the complication of having two rates for code telegrams instead of one rate; and there will be some minor variations of rule, thus plain language in mixed texts will be five letters to the word in one category and ten letters to the word in the other; figures will not be allowed in telegrams containing five-letter code except in the special case of commercial marks; and the new category of code telegrams will be subject to a special minimum charge as for four words, where that is more than the ordinary minimum of 1*s.* 3*d.*

The new rules are to come into force on Oct. 1, 1929, and they will be reviewed at the next Conference of the Union, which is to be held at Madrid in 1932.

J. L.

OBITUARY.

MR. S. J. J. H. VAN EMBDEN.

WE regret to announce the death of Mr. S. J. J. H. Van Embden, the Inspector-General of Telephones to the Dutch Administration of Posts and Telegraphs, and the Chief Delegate of that Administration to the International Consultative Committee on Long-Distance Telephony in Europe. Mr. Van Embden was one of the Vice-Presidents of the latter organisation and had for several years directed the labour of the Rapporteurs engaged in the study of administrative and traffic questions. The Committee had no more enthusiastic supporter than Mr. Van Embden, and his devotion to his work had made him universally esteemed. He was hospitable and companionable to an unusual degree, a lover of music and literature, and a man of the world in the best sense of the term. His British colleagues are not likely to forget the many kindnesses which they received at his hands during the Rapporteurs' meetings at The Hague.

H. G. T.

TELEPHONE ENGINEERING: COST ACCOUNTING GENERALITIES.

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THE title indicates the scope of the following remarks. For the unitiated it is observed that "Cost Accounts aim at a systematic and precise record of the cost of all operations, both main and subsidiary, involved in the performance of specific work"—a part of the financial and general accounts necessary to the solvency of the telephone and telegraph business—and should provide the means of an effective Headquarter and local control over the cost of all works carried out by the Department's staff.

This latter aspect, namely, to control the cost of individual operations, is that with which the Engineering Department is primarily concerned, and being intimately related to its organisation and staffing, is a subject of the first importance, demanding a system suitable to its needs.

The present unit cost accounting system was introduced in the Post Office Engineering Department in 1920. It has operated with some success and it is beyond dispute that the cost of producing the statistics has been amply justified. It has furnished valuable information not previously available, both for the control of staff and for standard cost details for estimating proposed works. Rival systems have been sifted and trials given to certain alternatives. In the opinion of the writers there is a tendency in some systems to over-elaboration and non-essential detail and to cloud the actual requirements in a fog of figures. On the other hand, a partial system on percentage audit of the cost of specified works (even if coupled with inspection thereof) is not considered adequate to provide the necessary control or to secure the financial saving expected. So far as the workman is concerned, simplification of detail and a minimum number of operations to be costed separately is essential to correct allocations.

The existence of a unit costing system in any business has a corrective influence on all operations and bears the relationship of a police force to a community, enforcing rectitude and maintaining its well-being.

This leads to the psychological effect of any system of costing which may be beneficial or injurious, according to the policy adopted by Headquarters as to publication and utilisation of the records. The danger to be countered is subtle, viz.: the tendency for the average time recorded, per operation, to be regarded by the staff as the allowance for that unit. A judicious and limited publication of the periodical figures is the only remedy for this negation of results.

It must be recognised that no system enabling control can be really effective without the interest and co-operation of the clerical staff who analyse its details and produce the statistics, and for this some knowledge of engineering details is an essential factor, but well within the ability of the present clerical force to provide.

Much thought and attention have been devoted to the object of producing a really effective instrument for controlling costs, and a stage has now been reached where some agreement upon a system of costing for general application throughout the whole country may be shortly expected.

What, then, are the main considerations in setting up such a system?

Briefly, we submit the following:—

(1) It should function as an auxiliary to direct supervision.

(2) It should lead to the discovery of weakness in organisation.

(3) It should stand as a referee upon all questions of increasing or decreasing staff at any given point.

(4) It should produce sound estimating figures.

(5) The moral effect of a prompt utilisation of the figures should be an integral part of the system.

(6) Investigation of organisation, on the spot, and personal inspection of completed works by a superior officer from District Headquarters should be undertaken *without delay where real weaknesses are indicated* by the records.

(7) Simplicity and adaptability are of the first importance, coupled with the release of workmen from all unnecessary clerical work.

It goes without saying that the cost of producing the figures should be commensurate with the results obtained, viz., losses prevented and savings effected.

That there will always be opponents to any system from the operative and supervising ranks, who must provide the details and submit to the examination of its labours, is recognised; and exponents of rival systems will continue whatever methods be adopted, but that evolution and cultivation will be the determining factors in producing *the* system we have little doubt, for there is not much room for genius in book-keeping.

TELEGRAPHIC MEMORABILIA.

THE International Telegraph Conference held a plenary session on Sept. 20 at Brussels, and accepted a compromise whereby two systems will be authorised with regard to the wording of code telegrams: that of 10-letter words at the present rates, and that of five-letter words at reduced rates. The latter system permits all possible combinations of vowels or consonants in code words, says *The Times*. The proposal was approved by 46 of the countries represented; four countries did not vote.

It is, perhaps, necessary to recall to our readers the fact that on Sept. 14, at a meeting of this Conference, the leader of the German delegation, Herr Arendt, read a report on the labours of the Commission which had been entrusted with the work of drawing to the attention of customers the difficulties in the present system of making known their wishes, and of discovering means whereby those difficulties might be overcome. During the discussion the representative of the International Chamber of Commerce, Sir John Sandeman Allen, M.P., said that the latter body was not opposed to all changes, but could not consent to any increase in the cost of telegrams. The Congress then discussed the proposal of the Committee at Cortina for a uniform tariff at lower rates for clear and code words, the charge being 66% of the full rate in zones other than European and 90% in the European zone. The delegation of the United States of America opposed any change in the present system, and those of Great Britain and Canada objected to any increase in charges. As an undertaking was not given that charges would not be increased, the delegates from the International Chamber of Commerce withdrew from the Congress. A representative of German industry enumerated the advantages of an application of the proposals of the Cortina Committee, and said that even if the cost of telegrams was increased by one-half, it would be to the interest of German industry to support the change. A Swedish delegate then urged the merits of the system of code words with a maximum of six letters as used in the Scandinavian countries. The Conference had thus three proposals before it: First, that of the Cortina Committee, for the reduction of code words from ten to five letters, with a reduction in charges. Secondly, that of the British for no change. Thirdly, the Swedish proposal for code words of six letters. The Conference therefore decided that a Committee should examine the various proposals and report upon them.

AUSTRALIA.—Mr. Brown, Director of Postal Services, predicts the early establishment of a wireless telephony service between Australia and the United Kingdom. The London *Daily Telegraph* reports him as saying that it will be a Government controlled service, undertaken by the British and Australian Governments conjointly.

The following is an abridged report of the Annual Statement of the Pacific Cable Board for the year ended March 31, 1928:—

The financial position as therein given shows that the total receipts were £397,730, while the traffic receipts, £387,046, fell short of those of the previous year by £80,018. The report adds that this reduction of revenue was due entirely to the entry into the telegraph field of a beam wireless service between the British Isles and Australia. This service, which was opened in April, 1927, at lower rates than those of the cables, succeeded in attracting a substantial portion of the business hitherto carried by the cables. The loss was chiefly in the cheap classes of traffic which are limited to plain language and are subject to delay. The Board's expenditure during the year was £355,622, a decrease of £32,140. Sums aggregating £7,554 have been expended from the reserve and renewal fund during the year in connexion with the duplication of the cables between Vancouver Island and Fiji. As a consequence of the introduction of automatic apparatus and also the reduction of traffic, the service was found to be largely overstaffed. Accordingly, the training establishments at Bamfield and Sydney were closed down and the students then in course of training were disbanded. The surplus staff has been substantially reduced by resignations, and advantage is being taken of the remaining surplus to work off a large amount of arrears of long leave.

During the year approximately 9,200,000 words of international traffic (viz., traffic other than local messages between Australia, New Zealand and the Pacific Islands) were transmitted over the Board's system. This volume was less by approximately 2,800,000 words than that carried during the previous year. The ordinary or full rate International traffic showed a reduction of approximately 220,000 words, deferred ordinary 269,000 words, daily letter telegrams 235,000 words, week-end telegrams 2,000,000 words, Government 60,000 words, and Press 53,000 words. There was an increase of approximately 40,000 words of deferred Press traffic.

(See also under WEST INDIES.)

BELGIUM.—A meeting of the International Scientific Radio Union was held in Brussels last month to consider means of accelerating the advancement of practical applications of radio-electrical science. On the initiative of Mr. Robert Goldschmidt, the Belgian Secretary-General of the Union, who contributed 200,000 fr. (£1,140) as a first gift, says *The Times*, it has been decided to establish in Brussels a radio-telegraph experimental centre.

BOLIVIA.—The Bolivian Government has recently issued statistics of the country's foreign trade in 1926. From these the following figures relating to the imports of telegraph and telephone apparatus have been extracted, the comparative figures for 1925 being added and notes of any increases or decreases given:—

	1925. (*Values in* 1,000 *bolivianos.*)	1926.	*Inc. or dec.*
Total	94	178	+ 84
From Great Britain ...	3	61	+ 58
„ United States ...	20	41	+ 21
„ Germany	20	14	— 6
„ France	12	23	+ 11
„ Chile	31	18	— 13

(12½ bolivianos = £1.)

CANADA.—Canada, according to one of the Government Radio Inspectors, is unaffected by the U.S.A. Federal Radio Commission's new allotment of wavelengths throughout the five zones that will divide the United States equally and reduce the number of full-time broadcasting assignments from 545 to 310. The only change so far as the Dominion is concerned is that there will be one less shared wavelength, only 11, whereas formerly there were 12.

An important conference on the allocation of wavelengths will be held in Ottawa about the middle of the present month, at which will attend representatives of the Governments of the United States, Mexico, Cuba and Canada. Commander C. P. Edwards, Director of the Radio Branch of the Department of Marine, attended a conference in Washington, where various angles of the problem were dealt with. Further investigation was agreed upon, with a view to final reports being submitted at the meeting to be held in Ottawa 90 days after the Washington adjournment, says *World Radio*.

EGYPT.—More than ordinary interest has been exhibited on the part of manufacturers in the tenders for the supply and laying of the Cairo—Alexandria trunk cable, already mentioned in these columns, and the following list of the most important tenders received is supplied by Reuter's Trade Service, Cairo.

The main quotations are for heavy-loaded cable and the alternatives are generally for up-to-date *repeatered* cable similar to that used for long-distance trunk lines in Europe.

	(£E)
Siemens, Bros. & Co., Ltd.	205,300
Standard Telephones & Cables, Ltd.	217,973
Standard Telephones & Cables, Ltd., first alternative	227,672
Standard Telephones & Cables, Ltd., second alternative	159,497
British Insulated Cables, Ltd.	222,437
W. T. Henley's Telegraph Works Co., Ltd.	226,994
Callender's Cable & Construction Co., Ltd.	227,296
W. F. Dennis, agent for Felten & Guillaume ...	234,564
Pirelli	246,589
Pirelli, first alternative	187,949
Pirelli, second alternative	152,375
Siemens & Halske	251,847
Siemens & Halske, first alternative	149,126
Siemens & Halske, second alternative	133,970

FRANCE.—A new regulation has lately been issued by the French Postal and Telegraph Authorities under which subscribers to the telephone service throughout France are to be permitted to install teletype apparatus in connexion with their instruments to enable telegraph communications to be transmitted to other subscribers, or to the telephoned telegram section of the French Telegraph Department.

"Stands Paris where it did?" may well be asked when one reads that on the authority of the French Bureau of Longitudes, hitherto "navigators and astronomers" have made an error of about six yards in the location of the French capital.

Thanks to observations—astronomical and radio combined—the exact longitude of the city is now definitely determined as two-hundredths of a second farther east than had been supposed!

GERMANY.—It is interesting to learn that a British firm, Messrs. Newton Brothers (Derby), Ltd., have just secured an order from the German State Telegraphs, Berlin, for a 50-kw., 10,000-volt direct-current generating set. It is to be motor-driven and similar in type, size and voltage to the sets designed, manufactured and installed at the British Broadcasting Station, 5GB, Daventry, and the Marconi Beam Radio Station, Dorchester.

In the last quarter there was a great diminution in the number of convictions of "pirates" in Germany, says *World Radio*, the total falling to 331, as compared with 1,003 for the corresponding period in 1927. Licence-holders are approaching the two and a half million mark, and blind licensees (who, as in England, are allowed free licences) now number 15,629.

The same authority states that the German short-wave high-power station will begin broadcasting early next year. Progress is being made with the two simultaneous transmitters at Berlin (East) and Magdeburg, and it is hoped that they will be finished by December. At the Flensburg station work has begun on the aerial masts. With the completion of these three stations, the total number of German transmitters, reduced to 24 when Dortmund closed down, will be increased to 27.

Commenting on the Berlin Wireless Exhibition held early in September a trade correspondent of the *Electrician* remarks: "The wireless trade in Germany is developing tremendously, and this year three exhibition halls were required to house the exhibits. All these were situated on the exhibition grounds at Witzleben, and could be visited without having to leave the grounds, the latter being laid out in a very attractive manner with the object of making the place a regular resort for Berliners. It is probable that the attractions of the well-ordered gardens and the miniature Eiffel tower helped to account for some of the extremely large attendances—frequently in the neighbourhood of 200,000—which have been a feature of the wireless exhibitions held there.

The exhibition was strictly confined to the display of wireless goods manufactured in Germany, no foreign-made articles being admitted. This precaution was not altogether unnecessary, as the German market is not, as is often supposed, the exclusive preserve of home manufacturers. In spite of tariffs and the strength of local competition, there is an influx of certain imported wireless material, more especially valves from Holland and Austria. In a rather unexpected direction, there is also some competition from Sweden, and the Baltic Company have now established a subsidiary company in Berlin.

"Amongst the more elaborate apparatus exhibited this year," continues the correspondent, "should be mentioned the Lorenz-Korn picture transmitting apparatus as used by the police authorities. Dr. Korn is one of the original investigators in the field of wireless picture transmission, although now not so much heard of as some of the later inventors. Telefunken apparatus for speaking films was also demonstrated, as well as the other interesting Telefunken development for the wireless transmission of film pictures. With the Karolus system, the film runs continuously through the transmitter at a speed of 10 pictures per second, and each picture is divided into 10,000 elements, though it is stated that it is quite possible for this speed to be increased. From a technical point of view this exhibit is one of the most intersting at the exhibition.

GREAT BRITAIN.—Speaking at a dinner of the Radio Manufacturers' Association held at Olympia, London, the evening prior to the opening of the highly successful National Radio Exhibition, Senatore G. Marconi said: "It is a wonderful revelation to me to see what the radio industry has achieved and is achieving. . . . Wireless has become the most potent means of communication ever known to mankind, and the fullest development of wireless is still before us. The future is full of promise, and I think it will be full of surprises. I am still of opinion that we are a long way from being able to utilise electric waves to their fullest extent." It was mentioned at the same gathering as a surprising fact that although in bulk more wireless apparatus had been manufactured in the United States, nevertheless, while in the latter country one in every five houses is supplied with radio receivers one in every three is so furnished in Great Britain.

It was notable, too, at this particular exhibition, that the ruling of the British Patent Authorities regarding the excessive royalties charged on valves, had had an immediate effect in the reduction of prices, so that "the more elaborate and efficient apparatus was now brought within reach of a wider public."

The *Evening News* reports that the British Broadcasting Corporation intends to build new premises to replace its present headquarters at Savoy Hill. To this end negotiations are in progress regarding the construction of a building on a site at the corner of Portland Place and Langham Street, Oxford Circus, London. The first twin-wave regional station that is being built at Brookmans Park will eventually replace the London transmitter (2LO), which is situated on the roof of stores in Oxford Street.

For the special information of our Colonial and foreign readers the following interesting particulars are excerpted from the official publication published by H.M. Stationery Office, London, entitled, "The First Annual Report of the British Broadcasting Corporation," and may be thus summarised:—

"A total profit of £128,336 is shown in the Revenue Account for 1927. Of this amount, £100,000 is transferred to the capital account to cover future expenditure in the construction and equipment of regional stations. These are designed to give the greatest number of listeners an uninterrupted service of two programmes.

"Licences in force at the end of 1927 numbered 2,395,174, an increase during the year of 217,000.

"No fewer than 60,000 letters were received from listeners during the year with reference to programmes.

"'Prospects are encouraging for Empire broadcasting,' states the report, 'although undue expectations for the near future are to be discouraged. As a result of experimental work carried out at Chelmsford to determine the best method of linking widely-separated broadcasting systems where land lines are impracticable, it was found that short-wave telephony stations will in all probability provide the necessary link.'

"Educational broadcast gained steadily in importance and popularity, approximately 4,000 schools listening-in to London and Daventry schools transmissions alone, this being double the number for the previous year. Music formed about two-thirds of all programmes.

"Transmissions from all stations covered over 68,000 hours in 1927, the percentage of breakdown being only .03. There was a strong and growing demand for features other than entertainment."

Much the largest part of the B.B.C.'s income comes from the Post Office, based on the number of receiving licences issued. Of all fees collected, 12½% is retained by the Post Office to cover costs of collection and administration. Then, in respect of the first million licences issued, the Treasury retains a further 10%; in respect of the second million, 20%; of the third, 30%; of anything over three millions, 40%.

The revenue account gives some interesting details of the expenditure side, programmes, &c. (including costs of artists, orchestras, news, royalties, performing rights and simultaneous broadcast telephone system, and salaries of programme staff), costing no less than £487,728; maintenance of plant, power, salaries and expenses of engineering staff, development and research, &c., £131,036. The balance, being the net revenue for the year, was £128,336. The income was £901,626, made up of licence income £800,959; net revenue from publications, £93,686; and interest and sundry receipts, £6,980."

Llandudno.—The urban district council has consented to the proposals of Broadcast Relay Service, Ltd., to open a broadcast reception relay station in the town and erect wires where necessary.

Southampton.—Twelve hundred miles out, the surgeons of the Cunard liner *Berengaria*, which recently arrived at Southampton, wirelessed to New York asking for advice on the treatment of a passenger. The reply was received within seven minutes.

The passenger was Dr. M. Shiffman, a New York surgeon who was taking a crate of 10 snakes, including two rattlesnakes and two copperheads, to Vienna for laboratory purposes. While taking out a snake which had died he was bitten on the finger by a copperhead. His arm immediately swelled, and his condition became critical.

He was attended to by the liner's surgeons, but since they were not certain whether they were applying the right treatment, the message to New York was sent. The reply showed their treatment was correct, and when Dr. Shiffman disembarked at Cherbourg he had nearly recovered.

A British fleet order has been issued to the effect that Navy telegraphists who passed professionally in the Signal School for advancement to leading telegraphist before July 16, 1926, are not required to obtain educational certificate, Part 1, as a condition of advancement to leading telegraphist.

If the information, from a usually very reliable source, is correct, before these pages are in the hands of our readers—actually Oct. 30—the B.B.C. will broadcast pictures from that day onwards each day excepting Sundays and Mondays. "The pictures," says the *Daily News*, "will be supplied to the B.B.C. on specially prepared copper plates ready for transmission. *The Electrical Review* states that the "Fultograph" system will be used and that the broadcast will be made from Daventry (5XX).

The receiver, says the same periodical, may be connected to any ordinary radio set capable of operating a loudspeaker. It will work entirely automatically, consuming no more current than one ordinary valve; therefore, additional batteries will not be needed. The picture (3 by 4.5 in.) is built up gradually in three minutes, during which time the process can be watched on the cylinder of the instrument, which is revolved by spring clock works; when complete, the picture does not require fixing or developing, as a specially prepared paper is used.

The position of "still pictures" and television matters appears to be well laid down by the *Daily Telegraph*, which says that: "It is true that the Fultograph system has been tested by the B.B.C., and found sufficiently satisfactory to warrant the commencement of a series of picture broadcasts; but should the novelty prove popular, and should the service be extended, the B.B.C. will not be likely to grant a monopoly to one particular concern.

"The same applies to television. The B.B.C. is open to consider other systems, and it has one main object in view, i.e., to give listeners the best system. There will be no question of monopoly and long-term contracts, and the wireless trade in general is expecting its share of increased business, should a still picture service or a television service eventually prove satisfactory and popular."

Three days later the wireless correspondent of the *Telegraph* writes to the effect that there are apparently grave doubts concerning the suitability of the Baird system for Television broadcasting, but the B.B.C. are waiting the report of their engineers.

Mr. Baird recently stated to a London daily journal that he was confident that in the near future the public will be able to see by radio an image of the artist who is broadcasting.

The Electrical Review says: "Television, with the human voice synchronised with the picture, has often been foreshadowed: Mr. John L. Baird has achieved a considerable measure of success, and a recent demonstration convinced us that the results he now obtains are a material improvement on his earlier ones. The art has reached a stage which is at least comparable with, if not slightly better than, that of voice and music reproduction when broadcast radio-telephone apparatus was first marketed commercially. It is by no means perfect, of course, but without doubt the transmission almost instantaneously to a distance of images of objects by telegraphy, either wire or wireless, has been accomplished."

The representative of the *Electrician* who witnessed a demonstration of the Baird system at the Radio Exhibition in London was distinctly disappointed with what he saw, and confirmatory of this opinion, though not conclusively so, comes the news that, over date Oct. 17, the British Broadcasting Corporation has issued the following statement:—

"In agreement with the Post Office, the B.B.C. required a studio demonstration of the Baird television apparatus before considering whether there should be public experiments, in which a B.B.C. station would participate. A demonstration took place at the offices of the Baird Television Development Company, Ltd., on Oct. 9, and was attended by administrative and technical officials of the Corporation.

"The opinion of the B.B.C. representatives was that, while the demonstration was interesting as an experiment, it failed to fulfil the conditions which would justify trial through a B.B.C. station.

"The board of the Corporation has decided that an experimental transmission through a B.B.C. station shall not be undertaken at present. The Corporation would be ready to review this decision if and when development justified it."

One of their directors has since stated that the decision may cause the Baird Company to erect a station abroad for the benefit of their subscribers in Great Britain and other countries.

At the autumn Trade Conference of the Music Trades Association, Mr. C. Foulds, presiding, raised the question of the position of the gramophone, which had been linked up with radio in a combined instrument and for which it was claimed that the proper channel for the sale of this combination should be the retail *music* trade. Mr. Mould, of the Radio Manufacturers Association, asked whether it was considered that *his* trade was a branch of the music industry. The president of the Music Trades Association replied by expressing the hope that it soon would be.

From what one has been able to gather up to the moment, matters seem to have ended with a standardisation of prices whichever industry was the retailer!

INDIA.—According to *The Electrical Review*, in view of the complaints of business communities in Ceylon and India that they are being subjected to serious inconvenience on account of delay and mutilation caused by what is called an obsolete system of telegraph working, the Government is carrying out experiments between Madras and Colombo to provide for simultaneous communication between Colombo and Madras and Colombo and Madura. This would double the carrying capacity of one cable and would greatly accelerate disposal of traffic for stations south of Madura which hitherto has had to travel *via* Madras.

IRISH FREE STATE.—On Oct. 1, the charge for a telegram sent from Great Britain or Northern Ireland to any place within the Irish Free State became 1*s.* 6*d.* for 12 words, or less, and 1*d.* for every word over 12.

LEEWARD ISLANDS.—A tornado early last month destroyed the telephone exchange and lines throughout the island of Montserrat. The systems at St. Christopher (St. Kitts) and Nevis also suffered, while country lines at Roseau (Dominica) were demolished.

MEXICO.—*The Electrical Review* states that the Mexican Legation has informed *World Radio* that a new transmitting station has been opened at San Lazaro, a suburb of Mexico City, to broadcast Mexican news, and it is further stated that it is sufficiently powerful to ensure reception throughout Europe. The times of transmission will be 9 a.m. daily on a wavelength of 44 metres. The call sign of the station is XC51.

NEW ZEALAND.—The Officer-in-Charge of the Wellington (N.Z.) Trade Commissioner's Office has forwarded to the Department of Overseas Trade a report upon New Zealand's import trade during 1926 and 1927. In the course of this it is stated that the imports of copper wire declined from £241,786 in 1926 to £186,095 in 1927, but the United Kingdom's share of this trade rose from 79.2 to 90.4%. The imports of electric batteries and cells rose to £152,060 in 1927. The bulk of these was supplied by the United States (£93,323); the United Kingdom's share was £36,770, and that of Canada £18,730. The United Kingdom has steadily improved her position in the imports of insulated cable and wire at the expense of the United States, and in 1927 claimed £484,781 out of a total of £520,534; the United States accounted for £7,353, Canada for £10,023, Belgium for £10,269, and Germany for £4,444. In telegraph and telephone apparatus (including wireless) there was a rise from £295,817 to £391,149. The United States led in this section with £178,271, the next being the United Kingdom (£93,918), Belgium (£72,003), the Netherlands (£12,534), Australia (£7,913), Sweden (£5,067), and Canada (£4,939).

The revenue of the New Zealand Post and Telegraph Department for the year 1927-8 was £3,329,511, made up of postal revenue £1,439,586, telegrams, £435,514, and toll and other telephone calls, £1,454,411, and the expenditure was £2,299,571, leaving a surplus of £1,029,940 available for interest and depreciation, compared with £874,392 in the preceding year. The total receipts for 1927-8 were £1,088,845 in excess of those for the previous year. At Dec. 31, 1927, the number of radio receiving licences issued in the Dominions was 38,125, and at March 31, 1928, the total approached 40,000. The automatic telephone service has been applied to rural lines in the Wellington exchange area, and the extension of the system to other rural districts is being considered. The number of subscribers' main telephone stations on March 31, 1928, was 114,079, and toll and service stations, public call offices and extension stations brought the total up to 139,740.

PORTUGUESE EAST AFRICA.—In the course of a report upon conditions in Portuguese East Africa (reproduced in the *Board of Trade Journal*), Mr. Joseph Pyke, British Consul-General at Lourenço Marques, says that a steady increase in the telephone service is taking place, there being about 700 telephones in the district of Lourenço Marques, while the land telegraph service is maintained in an efficient state. Development in this direction is, however, rather by way of extension of the wireless system. The towns of Chai Chai (Vila de Joao Belo) and Porto Amelia are being equipped with Marconi plant, and the station at Tete is on the point of being opened for communication with the Colony. A powerful beam station was opened at Lourenço Marques early last year, and the results secured would appear to have exceeded the hopes of the promoters of the enterprise; business with Europe has even been obtained in the Union of South Africa.

RUSSIA.—Plans for early radio-telegraph communication between the United States and Soviet Russia were announced by Mr. G. Gurevitch, acting chairman of the board of directors of the Amtorg Trading Corporation, New York City, in discussing an agreement recently made between the Radio Corporation of America and the Soviet State Electrotechnical Trust of Weak Current Factories, calling for technical co-operation and exchanges of patent and engineering information between the two organisations. The Amtorg Corporation has also placed a large order for radio equipment in the United States, he said. The Soviet State Weak Current Trust operates the principal factories in the Soviet Union producing telegraph, telephone and radio equipment.

Intensive development of radio communication is also expected in Russia, according to *The Electrical Review*, where 67 broadcasting stations and 250,000 receiving sets are claimed to be in use.

A Radio University has been opened at Leningrad, according to the Riga correspondent of the *Daily Telegraph*. The object of the new institution is to train specialists for Soviet radio stations and to prepare students as lecturers, &c.

SPAIN.—A conference of wireless maritime associations representing the principal wireless maritime companies of the world, was recently held at San Sebastian, Spain, and an international radio maritime committee was formed. The purpose of the committee is to pool the experience and specialised knowledge of wireless companies for the benefit of shopowners, passengers, and the public generally, and to aid all those who are interested in the development and use of wireless at sea. Mr. A. Hubert, managing director of the Belgian company, was elected president of the new committee, and Mr. F. S. Hayburn, general manager of the Marconi International Marine Communication Co., Ltd., was elected vice-president.

SWEDEN.—*The Electrical Review* states that the Government Telegraph and Telephone Department, in its preliminary budget, plan for 1929-30, calls on the Treasury for a sum of 8,618,593 kronor, of which 7,000,000 kr. is for the further extension and development of the telephone and telegraph systems. The Department plans the building of new broadcasting stations at a cost of 1,200,00 kr., and the broadcasting stations of Stockholm and Sundsvall will be rebuilt. A new submarine telephone cable will be laid to the island of Gotland in the Baltic at a cost of 1,300,000 kr., and the new telephone connexion with Finland will be opened for traffic early next year.

SWITZERLAND.—The Department of Overseas Trade is informed that the Federal Administration of Telegraphs is issuing as from Sept. 1, monthly licences for wireless receivers. The formalities for their issue have been made very simple, as the object of the new system is to enable owners of new receiving sets to test their sets thoroughly before applying for the ordinary annual licence, the cost of which was raised from 12 to 15 francs on Jan. 1, 1928.

The Third (Reduction of Armaments) Committee has had before it the question of the League wireless station, which is considered by some nations as part of the machinery of security. However, says *The Times*, Mr. Cadogan, the British delegate, not only stated that Great Britain considered the cost of a purely League station to be altogether out of proportion to its possible utility, but that it did not agree with the Swiss Government's proposal to build a Swiss station, to be at the disposal of the League in time of crisis. The British Government was not sure that wireless was the most suitable form of transmission for the League, and, in any case, it did not think the League was justified in so adding to its financial commitments. The moment was not opportune for expenditure of that character.

U.S.A.—Reuter's New York agency cables that, by filing at Washington, on Sept. 26, before the Federal Radio Commission, its application for the allocation of 67 wavelengths over which to transmit domestic wireless messages, the Radio Corporation has taken the first step in what may become a struggle between it and the older established land-wire companies, such as the Western Union and the Mackay Companies. Ever since trans-oceanic wireless was placed in operation, the Radio Corporation, through lack of other facilities, has had to depend on other domestic telegraph companies with which it is in cable competition to carry to points within the

United States the messages it receives daily from abroad. The Radio Corporation claims, however, that this method of distribution has never been satisfactory, and it is now seeking permission to establish its own network of domestic stations (in all about 30, situated in the leading commercial centres of the country) so that it can distribute its own messages without employing others. Very likely the companies at present engaged in the domestic telegraph business will seek to oppose the Radio Corporation's application, and the development of a struggle is being watched with the keenest interest by the financial interests involved.

Quickly on the heels of the above information came news from the Washington branch of the same agency that the International Telephone and Telegraph Company, through its subsidiary, the Mackay Radio Company, has applied to the Federal Government for a number of short-wave channels, to make possible the establishment of a commercial wireless service throughout the country. Several other organisations have also applied for major allocations of short-wavelengths, chief among them being the Radio Corporation, which is seeking to supplement its international connexions.

A message from Washington to the Exchange Telegraph Company reports Mr. W. A. Winterbottom, the traffic manager of the Radio Corporation, as having said that if their petition were granted it would lower the land-wire tolls, and that the Radio Corporation has now four offices to handle 10,000 radiograms daily across the Atlantic and 2,000 over the Pacific, which had to be distributed in the interior over land lines.

Another interesting development is the following, regarding the political use of broadcasting. The *T. & T. Age* reports that permits for the construction of two radio transmitting stations of 10,000 watts each, one in New York and the other in Chicago, and licences for experimental operation on three short-wave channels have been granted to the Universal Wireless Communication Company by the Federal Radio Commission as the first step in a plan to set up a national radio communication network as a public utility. Politicians, says *The Age*, who have been declaring that to "just own or hire a radio broadcasting station and bawl them out" was all that would be necessary in the political campaigns this Fall, will be interested in the Federal Radio Commission's first decision on a matter of that kind, ordering station WCOT, of Providence, R.I., operated by Mr. Jacob Conn, to "go off the air" after Sept. 1. The decision is of national importance as laying down general principles which will govern the Commission's action in other similar cases.

More and more is the wisdom of the British quiet but firm control of broadcasting justified, judging from the above and the following paragraph :—

"In consequence of their alleged broadcasting of 'personal disputes,' four Pennsylvanian stations have been placed on probation for 30 days, says *World Radio*, pending a decision whether they shall be re-licensed or not."

Reuter's Agency states that the American Telegraph and Telephone Company has perfected a very sensitive submarine cable which, according to the company, will make it possible for the first time to secure effective telephonic communication by cable between the U.S. and England.

It is stated that this new cable promises more reliable service than that given by the best wireless methods known. The construction of such a cable for long-distance purposes is under consideration.

A New York correspondent of the London *Times Engineering Supplement* recently informed its readers of an automatic device, which utilises the hum of an aeroplane engine to close the circuit of an airport lighting system and has recently been designed by the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa. The device is so sensitive that it functions when the aeroplane is still 1,500 ft. above the landing field, yet has such selective qualities that it will not respond to any sound except that of an aeroplane engine.

The device consists of a microphone, resonant and amplifying circuits, a time element relay and contactors. The hum of the engine is picked up by the microphone, which is mounted in a vertical position so that it will best catch sound waves from the air above. The current thus induced in the microphone circuit is transmitted to a resonant circuit tuned to the frequency of the hum of the engine, where it is amplified many times. The tuning of the resonant circuit eliminates such sounds as voices and the noises of motor vehicles' engines and horns. Further insurance that the device will be actuated only by the hum of an aeroplane engine is provided by the time element relay, which is so adjusted as to function only after the sound has persisted over an unbroken period of 10 seconds.

The great floodgates of an airport consume a considerable amount of electrical energy, and such an installation will effect a material saving, since the lights will go on only when they are actually needed.

The *Leviathan*, of the United States Lines, which sailed from New York, on one of its recent voyages was guided to Southampton by an instrument named the fathometer. This measures the depth of water continuously by timing electric echoes, and thus makes it possible for the navigating officers to plot their course as accurately in darkness and fog as in clear daylight.

The fathometer is a small instrument about 1 ft. square, which transmits electrical sounds downward from the keel. The time required for return of the echoes is timed to a fraction of a second, and is translated into terms of depth on a clocklike dial.

WEST INDIES.—The following extracts form part of the report of the Pacific Cable Board mentioned above under "Australia," and refer to the financial year ended March 31, 1928, on the working of the submarine cable system and wireless-telegraph stations of the West Indian Islands and British Guiana shows that the traffic receipts (£52,568) exceeded those of the previous year by £2,654. The net expenditure (£33,270) was £310 less than that of the preceding year. The surplus of receipts over net expenditure amounted to £20,013, compared with £16,831, and the deficiency to be made good by the contributing Governments in respect of the year under review is £12,070.

GENERAL AND PERSONAL.—*Private Companies.*—The directors of the Eastern Extension, Australasia & China Telegraph Co., Ltd., have declared an interim dividend for the three months ended June 30, 1928, of 5*s.* per share, free of tax.

The directors of the Eastern Telegraph Co., Ltd., announce the payment of a dividend of 2½% on the ordinary stock, free of tax, for the quarter ended June 30.

The directors of the Marconi International Marine Communication Co., Ltd., have declared an interim dividend of 7½%, actual, less tax (against 4% last year), and they state that the estimated profits for the year will enable them to declare a final dividend of the same amount. This will make a total of 15%, as compared with 12½% last year.

In view of the statement issued by the board of the Marconi's Wireless Telegraph Co., Ltd., on Aug. 3, concerning the proposed merger with the cable companies and at the instance of an influential body of holders of £1 ordinary shares, a committee has been formed for the purpose of concerted action, if necessary. The committee consists of the Hon. W. B. L. Barrington, Chairman (Helbert, Wagg & Co., Ltd.), Mr. B. H. Binder (Binder, Hamlyn & Co.), Mr. S. R. Cooke (Rowe & Pitman), and Mr. H. A. Vernet (Robert Benson & Co., Ltd.), with power to co-opt. Messrs. Binder, Hamlyn & Co. will act as secretaries to the committee.

For Our Advertisers.—Contracts Open.—Where not otherwise stated, quote reference and apply Department for Overseas Trade, London, S.W. :—

Postmaster-General's Department, Melbourne, Nov. 27.—Supply of indicators (schedule C. 371). (Reference B.X. 4,751.)

Postmaster-General's Department, Melbourne, Nov. 27.—Supply of condensers (schedule C. 370). (Reference B.X. 4,753.)

South African Posts and Telegraphs, Nov. 29.—Telephone apparatus for Pretoria. (Reference B.X. 4,757.)

Victorian Electricity Commission, Dec. 17.—Supply of metal-clad switchgear and accessories (specification 28/68).

South African Posts and Telegraphs, Pretoria, Dec. 13.—Supply of solder, copper wire and cable (D.O.T.).

South African Railways and Harbours, Johannesburg, Dec. 13.—Supply of one 7-ton electrical overhead travelling crane (tender No. 1347). (Reference AX. 6989.)

New Zealand Government Railways, Dec. 20.—Sub-station equipment, including switchgear, transformers and cables, for Frankton Junction power and signalling supply (specification No. 101). (Reference B.X. 4,771.)

The tragic death of Mr. H. L. Upcott, Asst. Superintendent, C.T.O., while on holiday with his wife and daughter at Tintagel, constitutes a very real loss to the C.T.O. and has left a gap in that large circle of his friends which cannot be filled up. Mr. Upcott was an idealist who kept those ideals unsullied throughout a strenuous life and work for others. Side by side with this idealism there was a strongly marked vein of the practical which made him a strong bulwark of any organisation with which he might become associated, and a leader whom men would follow and trust. Thus, to select Upcott as Secretary meant trustworthy and precise minutes, as Treasurer or Auditor a meticulous exactitude that would satisfy the most exacting chartered accountant. As one who knew Hubert Upcott well through more than three decades the writer, though unavoidably belated, could not do less than place these few inadequate tributes upon his grave.

The friends of Mr. H. C. Mathias, Executive Officer in the A.G.D., were deeply grieved to hear of his death on Sept. 30, after but a very brief illness. It is true that those who knew him more intimately were well aware that his health had been none too good for some time, but the cheery postcards from Seaford, where he had been recuperating not more than a fortnight prior to his decease, had led most of us to expect a return to something nearer normal health and strength.

Mr. Mathias was of a retiring disposition and modest in the extreme. To be within the circle of his friendship was a privilege. A staunch Churchman of the broad cultured and liberal type, he was much respected in Battersea, with which district he had been associated since 1896, where for 25 years he was lay reader at St. Barnabas, Clapham Common. For several years he was Secretary of the Ruri-decanal Conference, but much to his deep regret he was compelled, under strict medical advice, to relinquish these and all similar activities three years ago.

The sincerest sympathy of a band of office friends, not only in his own particular department, but elsewhere in the Post Office, is tendered to Mrs. H. Mathias and her two orphaned daughters, and also to Mr. and Mrs. Mathias, senior, who, pathetically enough, hale and well in their 87th year, have now outlived all their children.

MAN.—Man with all his kith and kin counts for but an infinitesimal fraction of the surface of the earth, and yet it is the mind of man that has penetrated the cosmos and discovered the distant stars and nebulæ.—*Professor Donnan.* J. J. T.

LONDON TELEPHONE SERVICE NOTES.

Central Branch Notes.

THE results obtained by the Contract Branch during the month of August represented a net gain of 2,676 stations, as compared with 3,164 for the corresponding month of last year. The fact that the installation at one of the large terminal stations was given up in favour of a privately-owned switchboard helped to reduce the figure for September this year.

The net gain for the quarter ended September amounted to 9,622 stations, as compared with 9,541 for the corresponding period last year.

Many people have been doing some hard thinking to find an explanation of the poor business obtained during the summer months, and particularly in September this year. Complaints that trade was bad were general —with the exception of a few favoured industries—and, apparently, were justified, as the export returns for September showed a very substantial decrease. The fact that 10 days out of the 30 were Saturdays and Sundays undoubtedly had an appreciable effect, but the fine weather seems to have made it into a real holiday month, when most people were intent on enjoying the sunshine either at home or away rather than thinking of such things as telephones as an aid to shopping in wet and wintry weather.

It is expected that the figures for October will show a substantial increase, especially as the net gain for the first week was 1,800 stations—appreciably more than half the net gain for the whole of September.

The number of exhibitors at this year's Motor Show was 536, as compared with 543 last year—and orders were taken this year for 399 exchange lines, as compared with 398 last year. In addition to the exchange lines, 49 call offices, B.B.C. circuits and private wires, &c., have been provided this year, making a grand total of 448 lines.

The following letter was received from a subscriber :—

> "I beg to confirm that owing to my tendency coming to an end at the end of next March quarter, I am unable to renew the subscription for another year."

This is a tendency that certainly ought not to be encouraged.

* * * *

The London Telephonists' Society.

On Friday, Oct. 5, the first meeting of the 1928-29 Session of the London Telephonists' Society was held in the Lecture Hall of the City of London Y.M.C.A., Aldersgate Street, E.C.4.

The meeting was timed to commence at 6.30 p.m., and arrangements were made for the members of the Society to be given the opportunity of meeting and talking to old friends, and during the half-hour preceding the meeting tea was served in the annexe to the Lecture Hall. The general hum of conversation sufficiently testified to the pleasure derived thereby, and at the same time indicated the anticipation with which the events to follow were regarded.

According to custom, the first meeting of the season was devoted to the Presidential Address, and as the President for the present year is Mr. Horace Dive, the enthusiasm with which his advent was regarded was amply justified by its effect.

The chair was taken by the retiring President, Miss R. James, who, in a few well-chosen words, presented Mr. Dive to his audience.

It would be impossible without extensive quotation to describe the paper which was read to us. It covered vast fields, literary and technical, which were presented with a charm which welded them into an indissoluble whole. Mr. Dive ended his paper on a note of high hope, painting the future of all, but of "Telephone" people in particular, in such a manner that one felt that the future was indeed "Something to look forward to."

The meeting concluded after a general discussion, during which Mr. Dive was wholeheartedly thanked for the very real pleasure he had given to all who had the privilege of listening to his address.

* * * *

Rana Ladies' Annual Gala.

The Annual Gala of the Rana Ladies' Swimming Club (Controller's Office) was held this year on Oct. 4, at St. George's Baths, and was attended by an enthusiastic audience composed of all ranks of the L.T.S., both male and female, from the Controller downwards.

The Lady Superintendent, Miss Liddiard, who is President of the Club, was there, and kindly distributed the prizes to the winners immediately after each race—an excellent arrangement, which saved a great deal of time. Mr. Reimann, with a megaphone, was in splendid form as the announcer of the events and their results.

The well-arranged programme was even more attractive than usual, and the organisers certainly have a "flair" for thinking out novel and amusing events. There was, for instance, a "Nippy Race," won by Miss B. L. Day, where the competitors had to don cap and apron and wade through the water with their trays. There was the "Breakfast Rush," an obstacle race, of course, where the unfortunate clerk, before setting out for the office, had to dive for his breakfast, eat it on a slippery pole, then dress as suitably as the damp garments provided would permit, and swim to the tube, represented by a hoop.

More than one competitor arrived at this stage having lost her stocking *en route*, but Miss D. Hesse finished an easy first with her full complement of clothes.

The most amusing event, however, was the "Broncho Race." Each girl had to swim astride a fierce-looking steed of inflated rubber, but the animals proved so extraordinarily difficult to start, and so intractable, that the audience laughed uninterruptedly for quite ten minutes. Miss Shadbolt managed very pluckily, but even she arrived first at the winning post much more off than on her mount.

"Woodland Revels" was another event much appreciated by the audience, because of the charming way in which it was arranged. Three teams of girls transformed themselves before our eyes into fairies, elves and witches, and raced for toadstools and broomsticks.

A very wonderful exhibition of ornamental and fancy swimming was given by Mr. G. A. Wilkinson, of the Otter S.C., who was able to perform the most difficult feats both in and out of the water with the utmost ease and gracefulness. He could literally swim like any and every kind of fish, and the audience watched fascinated and with bated breath his imitations of a torpedo and a submarine.

Amongst the remaining events, which included some fine diving and life-saving displays, one must not forget to mention the exciting relay race between male members of the Accounts and Traffic Branches for the "Lotus" Shield, which was carried off by the Traffic; and the Championship for the "Liddiard" Cup, which was retained by the holder, Miss B. E. D. Taylor.

Altogether a most interesting and successful entertainment.

P. M.

Correction.

The result of the L.T.S. Plunging Championship was given incorrectly last month. The correct result was :—

Miss Brain, Royal Exchange	...	...	...	1
Miss Mason, Avenue	„	...	...	2
Miss Powell, Trunk	„	...	...	3

* * * *

Football.

There is a variation of the old adage which says that a bird in the hand is worth three up a tree, and good mid-field displays yielding no goals and points do not make league champions. A reminder that goals count in the struggle for honours was exemplified in the second league game of the season, played at Chiswick against the Board of Education.

We won by 3 goals to one, and probably the Board are still wondering how this was accomplished. Territorially the Board of Education enjoyed quite as much of the play as the home team, and it seemed at times that goals must accrue. Somehow, however, good leading-up play was wasted in front of goal or frustrated by relentless tackling by Smith and Thomson, the backs. Williams, also, was very sound in goal. London Telephone Service won because they proved to be the better opportunists.

The opening game of the season, against the Ministry of Health, was a much easier victory, and the margin of 3 goals to none does not over-estimate the difference between the two teams. Whilst it is satisfactory to record two opening wins, it is evident that the team requires strengthening in some departments, notably in the forwards, and it will probably be found necessary to make one or two experiments before a satisfactory combination is found.

The club will have held their first social event, a Dance, by the time these notes appear in print, but others will follow in the Dining Hall of the Cornwall House Refreshment Club during the season, and will be announced from time to time.

"THE G.P.O. PLAYERS" DRAMATIC SOCIETY.

IT is difficult to recall any play of recent years which has caused more discussion than "Outward Bound." Is there a Divinity which shapes our ends; or—is the fault, dear Brutus, in ourselves, that we are underlings? To this eternal question, Mr. Sutton Vane essays an answer. He limns, with inimitable skill, the salutary sense of comedy in humanity present even in the most tragic circumstances.

Literally, this is the drama of Life and Death. And the victor is life. It is a play for every man who has a heart to be touched or a sense of humour to be tickled.

The Society's production of the play, under the direction of Julien Mitchell (Director of the Julien Mitchell Repertory Company) will take place at King George's Hall, Caroline Street, Great Russell Street, W.C.—two minutes Tottenham Court Road Station—on Friday and Saturday, Nov. 9 and 10, commencing at 7.30 p.m. Tickets, *5s. 9d.*, *3s. 6d.*, *2s. 4d.* (all reserved), may be obtained, post free, from the Honorary Treasurer, Mr. J. Scott, Room 12, Third Floor, G.P.O. North, E.C.1.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Aug. 31, 1928, was 1,677,956, or 8,862 more than at the end of the previous month.

The growth for the month of August is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at August 31	595,342	1,082,614
Net increase for month	2,789	6,073
Residence Rate Subscribers—		
Total	138,782	220,903
Net increase	874	1,900
Call Office Stations—		
Total	5,460	19,525
Net increase	30	138
Kiosks—		
Total	1,081	4,392
Net increase	37	136
Rural Party Line Stations—		
Total	—	10,314
Net increase	—	46
Rural Railway Stations connected with Exchange System—		
Total	—	975
Net increase	—	12

The total number of inland trunk calls dealt with during June, 1928 (the latest statistics available), was 9,214,037, an increase of 751,638 or 8.9% over the corresponding month last year.

Outgoing international calls in June numbered 36,802, and incoming international calls 39,899, representing increases of 10,761 (41.3%) and 12,087 (43.5%), respectively, over June, 1927.

Further progress was made during the month of September with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Abercorn, Bermondsey (automatic), Mansion House, Monument, Tudor, Welbeck,

and among the more important exchanges extended were—

LONDON—Bushey Heath, Eltham, Hounslow, Hendon, Molesey, Putney, Riverside, Temple Bar, Terminus, Upper Warlingham ;

PROVINCES—Cheltenham (automatic), Clacton-on-Sea, Crewe, Dudley (automatic), Guildford, Langside, Linthorpe, Port Talbot, Tattenhall.

Seventy-one new overhead trunk circuits were completed, and 82 additional circuits were provided by means of spare wires in underground cables.

NATIONAL TELEPHONE COMPANY STAFF RE-UNION DINNER, 1928.

THE response to the brief intimation made last month of a proposed gathering in London of the staff of the late National Telephone Company has been so hearty and widespread that the two largest rooms in the New Criterion Restaurant in Piccadilly Circus—the Victoria Hall and the ballroom—have been secured for Monday, Dec. 10 and the time for the dinner fixed at 7 for 7.30 (Morning Dress).

All men and women who were at any time in the service of the National Telephone Company or of any of the preceding and constituent companies are heartily invited to attend this entirely unofficial gathering of former telephone colleagues. The total number of diners who can be accommodated is limited and tickets will be allotted in order of application. Subject to this unavoidable limit all friends who have been associated with the telephone industry prior to the transfer in 1912, as well as any Post Office officers who desire to be present will be welcome. It is therefore hoped that the gathering will include all the telephone pioneers in the country.

The Committee in charge of the arrangements for the gathering will provide every facility for those present to meet all old friends.

The price of the tickets is 7*s*. 6*d*. each and applications accompanied by a remittance should be sent to Mr. H. M. Darville, the Hon. Treasurer, "Kildare," 198, High Road, Wealdstone, Middlesex. Local representatives will act in the various large offices in London, so that remittances for tickets may be made in bulk to Mr. Darville.

Lord Harris, the surviving Director of the National Telephone Company hopes to attend the dinner as well as Mr. Anns, Mr. Goddard, Mr. Gill and Mr. Cook.

Messrs. Sinclair, Chambers, Coleman, Dalzell, Phillips, Preston, Shepherd and other principal officers of the old company are also expected.

Lieut.-Col. C. B. Clay will be in the Chair. The Secretary of the Arrangements Committee is Mr. T. A. Prout, 17, The Chine, London, N.21.

THE C.O.D.O.C. AGAIN !

"OWING to the length of the Opera no encores will be given," was the dictum which was prominently displayed on the programme of the C.T.O. Operatic, Dramatic, and Orchestral Club's production of the comic opera founded upon Fielding's novel and so charmingly set to music by Edward German. Certainly the dictum was necessary, and was adhered to most strictly, or surely some of us would have lost our last trains, for there was no doubt whatever concerning this further success, which must be added to the laurels of the C.O.D.O.C. talent and organisation.

If one were to pick out a name or two the selection might appear invidious where the team work was undoubtedly so excellently maintained.

When one is so closely associated with the C.T.O. one may well distrust one's judgment. The verdict, however, which was passed on the first night's performance (the writer was present on the second night only) by a gentleman friend who had never before seen any of the Club's productions, but whose standard is certainly that of the West End, was as follows : "There was scarcely a touch of the amateur about the whole thing from A to Z."

I cannot do better than leave it at that.

J. J. T.

MANCHESTER NOTES.

ON the evening of Oct. 1 the Supervising Staff of the Manchester District assembled to hear the first of a series of lectures on the Automatic System, which is to be given during the winter months by Mr. J. L. Parry, the Traffic Superintendent.

Practically every Supervising Officer was present when Mr. J. T. Whitelaw, the District Manager, rose to preface the initial lecture with a few remarks of appreciation. He expressed the view that the unanimous response the Supervising Officers had made to the opportunity now being afforded was a good omen for the not far distant time when the Manchester Director Scheme would be in operation.

Mr. Parry then briefly traversed the history of manual switching equipment and stated the considerations which had led to the adoption of the automatic system.

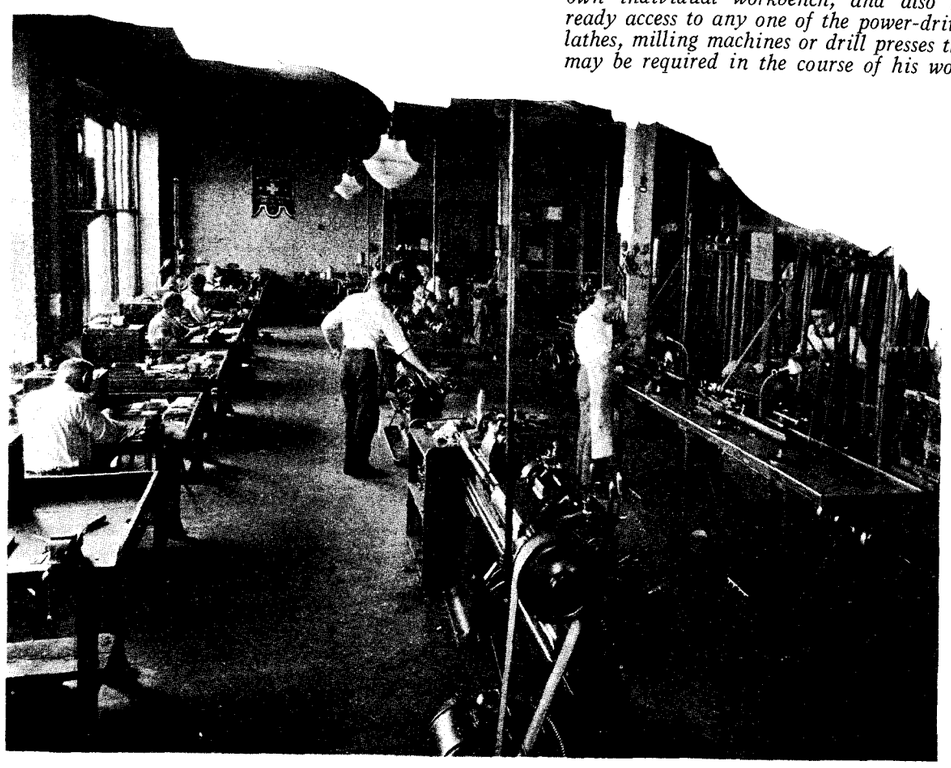
The working of the dial, line relay and rotary line switch were explained in some detail, use being made of slides, diagrams and a number of parts of the apparatus for the purpose of illustration.

The meeting closed with an examination of the apparatus available, several interesting questions being asked and amswered.

Where Strowger Automatic Leadership Begins ~

The Model Shop.

The accompanying view shows the well lighted and completely equipped model shop of the Research and Development Department. Each expert machinist has his own individual workbench, and also has ready access to any one of the power-driven lathes, milling machines or drill presses that may be required in the course of his work.



THE Research and Development Department of Automatic Electric Inc. has its own fully equipped and up-to-date machine shop for the fabrication of models of newly designed automatic equipment and for the production of apparatus designed especially for use in some particular experiment. It has a full complement of precision machinery capable of turning out parts requiring the utmost in skill and accuracy.

The personnel of this shop is composed of expert mechanics especially trained for fine model work, most of whom have had years of experience in the manufacture of Strowger Automatic equipment. The quality of their workmanship and ability has led them to be selected for positions in the model shop, where a high premium is placed upon personal responsibility and excellence of finished product. The care and precision with which their work is carried out, is but a reflection of the high standards which have been set by the accomplishments of the Research and Development Staff which directs their efforts.

More Than 3,500,000 Strowger Automatic Telephones in Service or on Order Throughout the World

Automatic Electric Inc.

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Sales and Service Offices in All Principal Cities

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Elsewhere -- Automatic Electric Company, Ltd.

STROWGER AUTOMATIC

The
Telegraph and Telephone Journal.

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Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. NOVEMBER, 1928. No. 164.

TALKING TO PEOPLE ABROAD.

IN the interesting and instructive paper on International Telephony which Mr. Frank Gill read last month before the London Telephone and Telegraph Society and which we reprint in another column, he made a reference to "Personal calls." As we consider this question is one of great significance for the successful development of European international telephony, we take this opportunity of expounding at some length our views on the scope of this class of service.

It need hardly, perhaps, be insisted on that long-distance telephone service is mostly used by business men; and a large proportion of the three thousand daily conversations between this country and the Continent are business calls between people speaking from their offices. Many firms maintain as part of their ordinary organisation a staff of people qualified to conduct their foreign telephone business. Such houses have someone always in attendance during office hours whose duty is, not only to answer the telephone promptly—a job which only too many firms unfortunately still seem to think can be adequately done by anyone who happens to be temporarily disengaged—but also to deal over the telephone in a responsible capacity with the foreign enquirer's business. For routine foreign business between firms of this type at home and abroad a prompt and reliable service from telephone to telephone is probably all that is wanted; and hitherto the efforts of the authorities have been directed to seeing that it is provided on all the Anglo-Continental telephone routes.

But there is another class of foreign business for which the telephone is also useful—even more useful, perhaps essential—the kind of business which can only be done by a personal talk between heads of firms or their departmental chiefs. For this class of work it is not enough to put the subscriber in touch with the telephone abroad whose number he has called; it is necessary to get on that telephone the particular man he wants to talk to, and to get him as soon as possible. In other words, the subscriber wants the telephone administrations to provide him with a "Personal Call Service" to his foreign correspondent's country. There are three requirements which such a service must fulfil if it is to meet the business man's needs.

(1) The telephone administrations at each end must co-operate with their subscribers as far as they can in finding the particular person wanted, whom the caller, of course, designates by name as well as by his telephone number when booking the call. For this additional service the administrations make a supplementary charge.

(2) If, for any reason, the person wanted at the other end cannot be found and put on the telephone—e.g., if he is neither in his office nor at home, nor obtainable at some other known telephone in the neighbourhood—the caller ought not to have to pay the full price for a call, but only the fixed supplementary "personal charge" in respect of the work which has been done in trying to find the person he wants.

(3) When the person wanted has been found and put on the telephone, the caller pays for his conversation according to its duration at the usual rates, in addition to the fixed supplementary charge for the work of search. It may happen, however, that a little time is lost, after the two telephones, or private branch exchanges, in each country are called up in readiness for the personal call, before the caller and the person he wants can be got to their respective telephones and can begin to talk to each other. In such a case, this lost time, within a reasonable fixed limit, should not be charged for; the charge at so much a minute for the 3, 4 or 10 minutes' talk, as the case may be, should only begin to run when the real personal call commences, i.e., from the moment when the caller and his correspondent are put in telephonic touch with each other.

It is a well-known axiom of telephone service that the co-operation of at least four persons is needed in the setting-up of a call, viz., that of two or more operators and two subscribers, and that a prompt answer by the called subscriber is an essential for the maintenance of a rapid service. This is especially important where international calls are concerned, because of the greater monetary value of the time at stake. While on the one hand the successful working of a personal call service requires a specially high degree of co-operation between the subscribers and their telephone administrations—e.g., in conveying promptly and accurately information about the whereabouts of the person called—on the other hand the regular practice of this co-operation cannot fail to react favourably in furthering the good relations between all concerned which are so essential to an efficient, and in particular to a speedy, service.

Now that the Anglo-Continental telephone services are showing such healthy and rapid development, the need for an optional

service of personal calls, to supplement the existing ordinary service, is being felt: and we understand that the British authorities hope it may be possible to arrange with the various foreign telephone administrations concerned to introduce such a service. A considerable amount of preparatory work, however, will be involved. Both the principles and the operating details (which must, of course, be uniform) have to be agreed between the two administrations interested in each of the Anglo-Continental routes. (On a few of the longest Anglo-Continental telephone routes, which are at an early stage of development, the calls are switched through to their destination at an exchange in one of the intermediate countries through which the line passes; for a personal call service on these routes, the co-operation of a third administration—the one in whose country the calls are switched—will be necessary.) At present, unfortunately, apart from the transatlantic person-to-person telephone service, which is now available, via London, to most of Western Europe, there is no personal call service meeting the above-described essential requirements on the Continent of Europe outside Scandinavia. (There, however, such a service has been worked successfully for some time, and is, we are informed, very popular.) Preliminary discussion will, therefore, probably be necessary before the new scheme can be launched—at all events generally—on the Anglo-Continental telephone routes; but it may be hoped that the efficient consultative machinery which now exists through the medium of the "C.C.I." will enable the difficulties to be successfully surmounted.

There is every reason to think that the personal call service will not only be used for business calls, but that it will also do much to encourage the nascent habit of talking over the telephone with one's friends on the Continent. To anyone thinking of ringing up a friend abroad it will naturally be an especial attraction no longer to have to hazard the price of a 3-minute call on the mere chance of finding his correspondent in, say, at his hotel, at some particular moment.

TELEGRAPHIC MATTERS.

WE wish to draw the attention of our colleagues on the Telegraph side to the fact that we do not hear from them with such frequency or regularity as we do from the Telephone side. We should like not only to receive articles on current telegraph problems, but we should be glad to publish "telegraph notes" of staff doings in the large centres, and occasional paragraphs on the retirements, promotions, &c., of the kind that reach us regarding telephone staff, in reference to telegraph officials. Articles on telephonic subjects have lately tended to preponderate in the columns of the *Journal*, and we invite the co-operation of our readers to assist in redressing the balance.

We have made arrangements for the provision of some special articles dealing with the activities of the senior branch of the two services, and are publishing one this month on the recent Telegraph Conference in Brussels. The Telegraph and Telephone Society promise us papers on telegraphy in the past, the future, and on developments in America, and no doubt these papers will afford much food for thought and serve as a stimulus to our correspondents.

The average citizen, when he considers the ever-increasing development of the telephone in all countries and the many important extensions of overseas communication which have taken place in recent—and especially the most recent—years, is apt to forget the less spectacular achievements of the far-flung and dependable telegraph network of the world. That network neither slumbers nor sleeps, but hums with a ceaseless activity of which there is much to record, and from which there is still much to learn. It still holds many a field and reaches many a remote spot whence instant communication with the outside world is not otherwise obtainable. Its future no man can predict, but it is difficult to conceive a time when it will not provide a complementary and indispensable sister service to that given by the telephone.

HIC ET UBIQUE.

LAST month saw the installation of the 600,000th telephone in the London area. This area includes more than one-third of the telephones in all Great Britain and Northern Ireland, which we estimate at the present moment to be about 1,730,000.

The Anglo-Italian telephone service, hitherto limited to communication with Milan, was extended on Oct. 18 to Turin and Geneva. Communication with these places is at present restricted to the London area. The charge for a 3 minute day call is 9*s*. 6*d*. to Turin and 10*s*. 9*d*. to Genoa.

According to a Reuter telegram, long-distance wireless telephone communication was established on Oct. 5 between Bandoeng (Java) and Buenos Aires via Kooten and Nauen (near Berlin).

Although communication was actually established the experiment was not entirely successful, and the trials will be continued.

On Jan. 1, 1929, according to the *Telegraph and Telephone Age*, the old Chinese number way, which to all intent and purpose was a code way of sending telegrams, will be displaced by an entirely new system based upon phonetics. It is simple and covers the thousand and more characters which go to make up the Chinese language. Thus, for the first time, the Chinese will be able to send telegrams in their own tongue. Some idea of the tremendous amount of work involved in this drastic yet progressive change may be had from the fact that no less than 15 years of research by a specially appointed commission headed by the American-trained Dr. C. C. Wang, have been required to make this phonetic system practicable.

We are informed that an automatic telephone system, with about 390 subscribers, has been opened in Smyrna by the Ericsson Company.

Beneath a comic drawing of a telephone lay-out in an American telephone journal is the legend: "Draftsman goes nutty. He tried to make a drawing foolproof!" We have come across the expressions "batty," "dotty," "dippy," "potty," "scatty," "sappy" and "loopy," and therefore take it that "nutty" means "mad," on the assumption that any consonant, short vowel, double consonant (preferably p or t) and y have this signification in the American language.

INTERNATIONAL TELEPHONY.*

BY F. GILL, O.B.E. (*Past President I.E.E., Vice-President International Telephone and Telegraph Corporation*).

IN January, 1923, over 5½ years ago, I spoke before this Society on, among other things, the urgent need for a new outlook on long-distance telephone service in Europe. Since then there has been a very radical change in this service, and Mr. Trayfoot told you a great deal about this subject last session, but I do not want to go over his ground again.

Let us begin our historical review by seeing what happened in this service between England and other places overseas. Fig. 1 begins with service opened with France in 1891; 12 years later, in 1903, came service with Belgium; 11 years later, in 1914, service with Switzerland began, and in 8 years more (which included the War years), in 1922, came service with Holland.

Then in 1923 the French Telephone Administration took a very momentous step. It called together a Preliminary Committee to consider what should be done to make better provision for dealing with the International service. As a result of this meeting the C.C.I. (Telephones) was formed in 1924; the first President was the late M. Denery, succeeded, on his untimely decease, by another Frenchman, M. Milon. The Secretary-General throughout has been M. Valensi. In assessing the good work which has been done by the C.C.I. this special contribution by France should not be forgotten.

In 1926 service with Germany began. In the next year, 1927, 5 services to Europe and 3 to North America† were opened, and in the present year, 8 places in Europe, 1 in North America, and 1 in Africa, were opened.

We have, therefore, between 1891 and 1923—32 years producing 4 services; since 1923, 5¾ years producing 15 services in or through Europe, as well as 4 in North America.

Fig. 2 shows the extent of the service between England and the Continent at Oct. 1 1928.

To illustrate to myself and others in a rough-and-ready fashion the progress taking place, I have been accustomed to consider the service between a number of capital and other cities in Europe, the number of cities being 19. It is obvious that the total number of possible services is $19 \times 18/2 = 171$. At the end of 1922, before the C.C.I. was formed, there were 28 of these services, = 16.4%, and of these 28, only 6 involved an intermediate or transit country—all the other 22 were between contiguous countries.

1	of these	19	towns	had	10 connections.
1	,, ,,	19	,,	,,	6 ,,
4	,, ,,	19	,,	,,	4 ,,
6	,, ,,	19	,,	,,	3 ,,
2	,, ,,	19	,,	,,	2 ,,
2	,, ,,	19	,,	,,	1 ,,
3	,, ,,	19	,,	,,	no ,,

By 1925 the number of services to other countries had increased by 2 and was then 29 out of the 171, or 17%. See Fig. 3.‡

OVERSEAS TELEPHONE SERVICE WITH ENGLAND

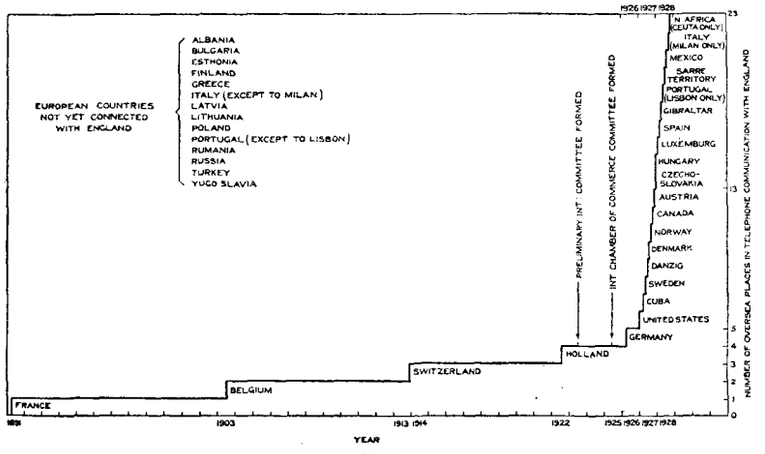


FIG. 1.

But by May, 1928, the work of the C.C.I. had become apparent; the number of these services had grown to 87 out of the 171, an increase of 60, or 50.9%, and by Oct. 1, 1928, as shown in Fig. 4‡, the number had increased to 98 or 57.3%.

A great advance has been made in the degree of transmission given over the International lines. Speech which was previously difficult and unsatisfactory has, in very many cases, become easy and the improvements continue as from time to time new areas of local territories are admitted to the International System.

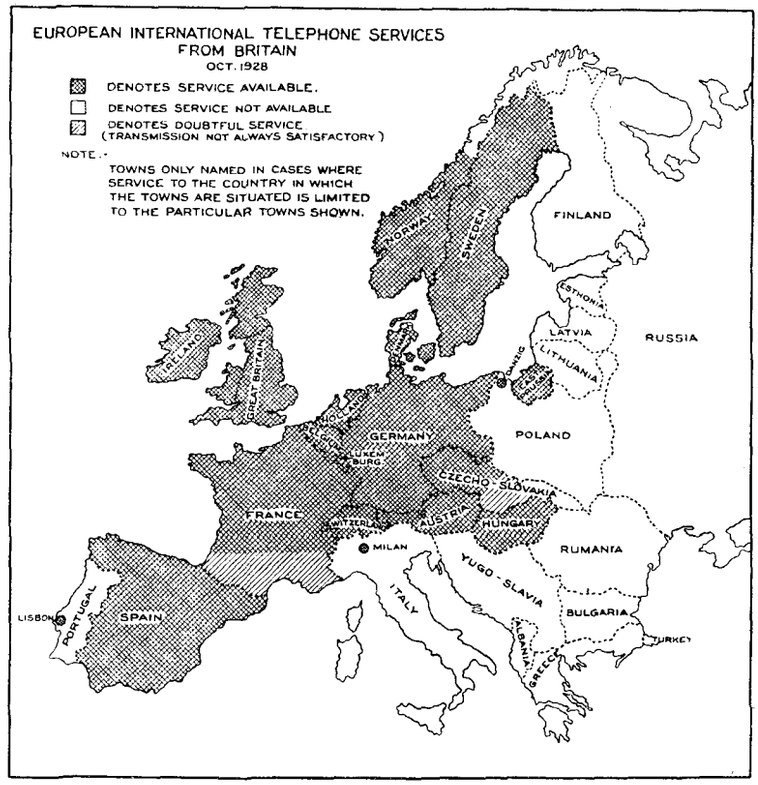


FIG. 2.

Another advance which should be mentioned is the reduction in the time elapsing between the ordering of a call and commencement of conversation. Here are some C.C.I. records of average delays in minutes, during busy hours :—

	1925.	1927.	*Last quarter of* 1927. (*The latest records available.*)
Berlin—Paris	130	68	34
,, —Vienna	143	62	43
,, —Stockholm	89	39	30
London—Amsterdam ...	61	34	32
,, —Brussels	31	19	8
Paris—Brussels	180	180	100
,, —Turin	180	10	10
Stockholm—Copenhagen ...	8	8	13

But lest it should be thought that all delays are no longer than those shown in the third column, let me say that in the last records there are many cases of average delays in busy hours of 60 minutes and over.

Another advance lies in the changes in service offered, e.g.,
Charging for each minute after 3 minutes instead of by unit of 3 minutes.
Fixed time and subscription calls made available.
"Notice" (préavis) calls have been introduced.

It is sometimes said that Toll Cables and Repeaters were developed during the War, and that, of course, the instrumentalities available were very different after the War. Of course, that is true, but it is not the explanation of the lack of service at the beginning of 1923.

For years, overhead bare wires had been the recognised means of transmitting speech; the London—Paris circuit, involving a submarine cable, had been in operation since 1891, 32 years. New York—Chicago circuit, 1,187 kms. long (736 miles) had been in operation since 1892. It is true that it is easier and more economical to give service now with our present facilities, but the real explanation for the lack of long-distance service in Europe was the absence of any organisation to deal with it.

Thus far we have great encouragement from the relatively rapid advance made recently, and we may well stop for a moment to acknowledge all that the C.C.I. has achieved and to express admiration and gratitude in respect of its work.

* Paper read before the Post Office Telephone and Telegraph Society of London on Oct. 15 1928.

† The American services were developed apart from the C.C.I.

‡ These diagrams are the copyright of the International Chamber of Commerce, to whom acknowledgment is made for their reproduction here.

But while according our full admiration, perhaps we shall do best to leave, for the moment, the things which are behind us and fix attention rather on the things which are in front and remain to be done. We must not forget that all these places are within easy telephonic reach of each other, that they are capital (or equivalent) cities of the countries, and that the history has shown that traffic is all the time waiting for facilities.

There still remain, after 5¾ years, about 42% of these cities without connexion with each other. There still remain some cities which are very badly served by International connexions. Perhaps there will still remain, when all these 19 cities are taken care of, other important cities in Europe not connected, and there will certainly be places just outside Europe still unconnected. Obviously, therefore, it is not yet time for a folding of the hands, nor for contentment with what has been accomplished.

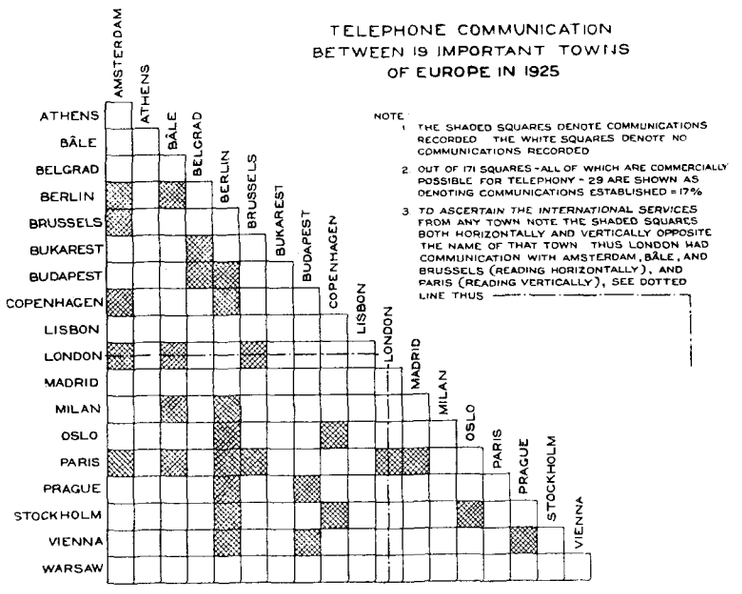


FIG. 3.

Fig. 5 shows a map of 1922; it shows some United States Long Lines then in every-day use projected on the map of Europe. To-day the longest line (practical crow-fly measurement), between International Toll Terminating Centres in public service is Lisbon to Berlin, about 2,310 kms. (1,430 miles). Although this length could be extended by considering the full distance covered between subscriber and subscriber, yet Europe of 1928 is still a long way behind the United States of 1922.

The time has come to extend our 19 cities. Fig. 6 gives the list extended to 34 towns; none of these can be dismissed as fantastic. The services which are now in operation, so far as I am aware of them, are shown shaded and the extent which they are available to the public is 29.8% on Oct. 1, 1928.

Towards the extension of service to these places, there were completed in Europe in 1927 5,000 kms. (3,100 miles) of Toll Cable. The most notable cases were Austria, nearly 800 kms., France over 1,000 kms., Belgium 460 kms., and Germany about 1,000 kms.

THE INTERNATIONAL CHAMBER OF COMMERCE.

We have spoken of the C.C.I. Telephones; there is another factor which should be mentioned, the International Chamber of Commerce, which first took up the question at Brussels in 1925 and has throughout operated with the full knowledge of the C.C.I., whose Secretary-General attends the meetings of the I.C.C. International Telephone Committee, and who has been very good in supplying information. The International Chamber of Commerce has placed on record its ideas of the importance of International Telephony, and the same applies to National service as well. The Report of the Stockholm Congress in 1927 states:—

"*The Importance of International Telephony.*

In the consideration of the subject by the Committee there early developed a growing realisation of the importance of international telephone service—

(*a*) As an effective instrumentality for removing impediments to international trade; and

(*b*) that the ability to secure speedy personal communication between distant cities should be a factor in stabilising business through a more orderly and economic movement of goods;

(*c*) that effective telephone service tends to facilitate all the processes of production and distribution;

(*d*) that ability to communicate information quickly, tends to minimise the range of price fluctuations and thereby lessen the tendency to speculation;

(*e*) that any instrumentality which tends to stabilise business, facilitate its processes, and effectively extend the field of operations with consequent increase in the volume of trade, should lessen the difficulties of international settlements, as after all, all settlements have to be made ultimately in goods or services;

(*f*) that the ability to communicate voice-to-voice, easily and speedily, whenever desired or needed, cannot but be a means of improving social relationships and developing a common economic and social viewpoint which inevitably must have an effect in promoting a better understanding between nations."

In the meetings of this Committee it has been particularly noticeable that what the business men desired as expressed in the report presented at the Stockholm Congress in July, 1927, was:—

"Uniform, dependable, fast service with good audition between all important trading centres in Europe."

Is not that an eminently reasonable request, in keeping with your own ideals? When we couple with that the numerous evidences of rapidly-increasing traffic, is it not a worth-while job to follow energetically the development of this Long-Distance Service? In the year 1926-27 nearly 37% of the small surplus made by the British Telephone System came from the Continental Telephone Service, and it seems a fair assumption that this service is a profitable one, as indeed it should be.

Let us now look further to the future and to some of the things which apparently require attention.

PARTIAL SERVICE.

There are still some places which are connected with each other for less than the complete 24 hours of the day. In some other instances connexions are set up every alternate half hour to produce direct trunks, thus producing the effect that there is only connexion between A and B during each alternate half hour and between A and C during the other alternate half hours. This produces long delays.

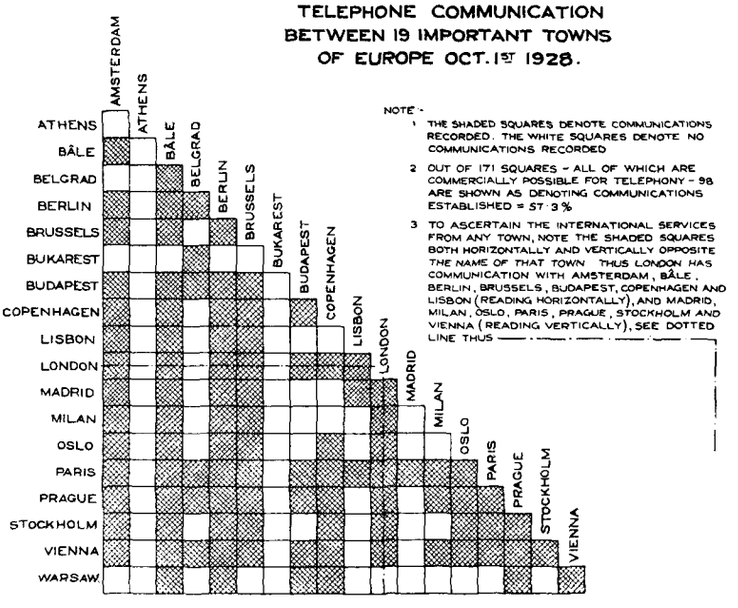


FIG. 4.

TOLL RATE PRINCIPLES.

There are two entirely different foundations for the Toll Rates in force in Europe. There is no difference in the degree of transmission afforded, and the two may be stated in condensed form thus:—

A.—Service is given at as cheap a rate as possible, this rate being termed "Ordinary." Ordinary calls should habitually experience a delay of not more than 30, 60, or 90 minutes, according to the length of the circuit. Calls may be ordered to be "Urgent" at triple ordinary rates, or to be very fast, "Lightning," at 10 times ordinary rates. Equipment is not intended to be provided to meet busy-hour loads, but is to be provided on the basis of the load spread out by reason of the delays permitted. Cheaper rates are in force in times of light traffic.

B.—All calls are of equal urgency and pay the same rate, called here the "Day" rates. A fast service with a delay not exceeding, say, 10 minutes, is aimed at. Equipment is provided to meet the busy-hour load. Cheaper rates are in force in times of light traffic.

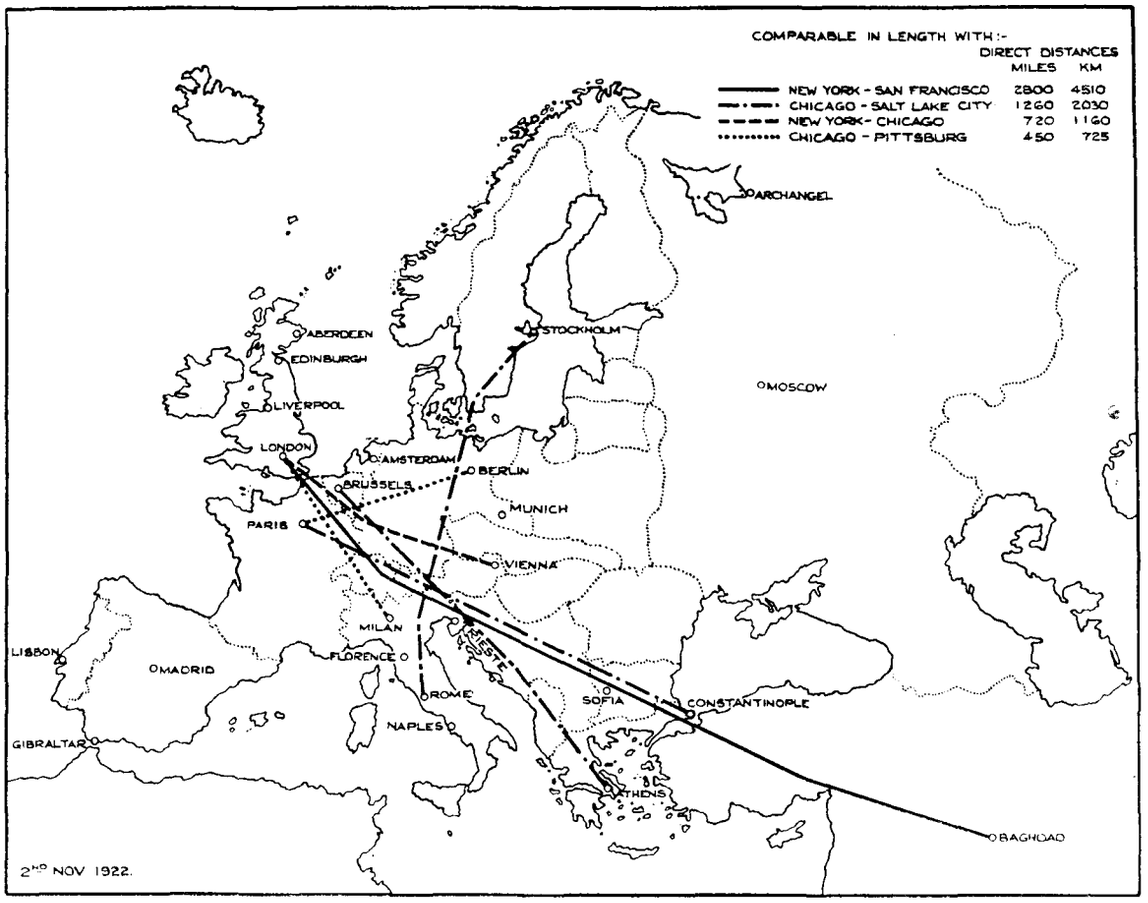


FIG. 5.

As would be expected, plan *A* leads to more calls per line per day, longer delays and a cheaper "Ordinary" rate. Plan *B* leads to fewer calls per line per day, a faster service and a "Day" rate which is dearer than the "Ordinary" rate under plan *A*.

But, obviously, the "Ordinary" rate may not be the rate paid by an individual, nor yet the average rate; this latter will depend upon the proportions of ordinary, urgent, and lightning calls.

To contrast the "Ordinary" Rates, plan *A*, with the "Day" Rates, plan *B*, is obviously misleading, yet it is constantly being done. Take a case of, say, between 700 and 800 kms.; at C.C.I. ordinary rates, the price is 6.4 gold francs. Against this take the London—Zurich day rate, 10.0 gold francs (about the same distance but including a submarine cable). But if we assume that out of 100 calls, 87 are ordinary, 12 are urgent, and 1 is lightning, then the average C.C.I. rate would be 8.51 gold francs, leaving 1.49 gold francs for the submarine cable to equal to the London—Zurich rate.

Or take the case where the ordinary calls are only 34%, the rest being at triple rates; the average price for 800 kms. at C.C.I. Rates would then be 14.85 gold francs.

Fig. 7 illustrates the C.C.I. Toll Rates as they vary in accordance with the proportion of Urgent calls.

Fig. 8 illustrates a published case; over a period of 16 months the percentage of call minutes at urgent rate rose from 45% to 66% and then fell to 16%, with a consequential great drop in revenue owing to the heavy falling-off in calls bringing in threefold fees, a loss not compensated for by general increase in Toll Traffic. The cause of the fall in urgent fees was that more trunks had been added and owing to a faster service, due to these additional facilities, there was less need to pay triple rates.

The right-hand part is the same curve reversed. I have assumed it is fair not only to consider what happens when the proportion of urgent fees falls off, but also when it increases. It increases because of congestion, subscribers making calls and suffering delays endeavour to mitigate their trouble by placing urgent orders. The scale at the right hand shows the average price ratio, assuming no lightning calls; in this assumption the average price ratio increases from 1.32 to 2.32, an increase of 76%. Is this likely to give satisfaction to the subscribers? Will they not examine their bills and feel that their calls are costing much more? Then when more trunks are added, as they must be, is not the Telephone Authority in a dilemma? If it improves the speed it may involve (in the case quoted it *did* involve) a loss in total revenue while, at the same time, it increases expenses.

One wonders—can there be a real place for lightning calls at 10 times the "ordinary" fee? If an urgent call at triple fee matures in *reasonable* time, it would seem unlikely that the speed could be so increased as to make a tenfold fee attractive; or conversely, if the tenfold fee calls are made, is it not rather because the urgent calls are much delayed and the ordinary calls are impossible? There are cases where the urgent calls over the whole day are about 70% of the total; probably that means that all the calls in the busy hours are urgent at triple rates. In some cases a lightning call passes out of that category into an urgent call if it does not mature *in 15 minutes*.

When it is found that the public pays a triple fee to reduce somewhat the average delays, is not that evidence that they are willing to back up your efforts to supply first-class service? Here are some figures of these delays:—

Examples of Average Delays in Minutes, Ordinary and Urgent, on the same Circuits in Busy Hours, 1927, C.C.I. Records.

On Ordinary Calls.	*On Urgent Calls.*	*% of Urgent Calls.*
20	8	10
13	6	2.4
16	9	4.5
71	41	12.5
18	5	1.8
38	17	not shown
41	28	"
33	13	"
90	36	"
120	48	"

All these points rather suggest that these special rates are founded upon old-time inadequate facilities, and will have to be abandoned in modern systems.

It is usual in Europe to consider the Toll Rates in the United States as altogether too high for Europe. But is that so, if we compare like with like, or as near as may be? In the A.T. & T. Report for the year 1927 it was stated:—

> "The average length of time for handling a toll call in the Bell System was reduced from 2 minutes in 1926 to 1½ minutes in 1927. About 90% of all toll calls are now handled while the subscriber remains at the telephone, as compared with 80% a year ago."

Take a case of a call between places, say, 1,430 kms. (890 miles) apart, and assume as near as may be similar service.

The Bell Long-Distance Rate for Person-to-Person service would be 23.40 gold francs for a 3-minute call.

The C.C.I. Lightning Rate on direct trunk would be 100 gold francs for a 3-minute call. It is doubtful if the delay would be any less than the delay on the Bell System, and the service would be inferior, in that no Particular Person Service would be afforded and the individuals required would have to be sought after communication was established, which might increase the fee. The reason why no préavis is assumed in this case is that, with the very fast call there would be no time in which to send the preliminary notice.

The C.C.I. Urgent Rate, with préavis fee, would be 33.30 gold francs for a 3-minute call. The delay would almost certainly be considerably more than in the Bell System call.

But comparing rates in different countries by merely converting the currencies is liable to be misleading, because it takes no account of the *relative* burden which the rate imposes, because that method pays no attention to the wealth of the person paying the rate. If consideration be given to this point, the United States rates are a good deal cheaper than they appear to be.

I submit that all the evidence tends to show that Europe desires a high speed service, is willing to pay for it, and that it should be possible to provide it.

Another matter in Toll Rates that requires unification is the various methods at present employed in zoning International calls. Fig. 9 contrasts the steps which constitute a zone in Great Britain and Germany. Note that the position of the two curves does not imply any relative price comparison.

PERSON-TO-PERSON SERVICE.

Another service facility about which there is at present lack of uniformity is that of Person-to-Person calls.

Mr. Lignell, of the Swedish Administration, has shown that in the Swedish experience the demand for this service increases with the length of the circuit. This seems quite what would be expected. If *A* in London wants to talk to Vienna, it is likely that *A* wishes to get into communication with a definite individual, *B*, and it is probably not of much interest to *A* to talk to *B*'s office or hotel and be informed that *B* is absent. Further, the time lost in calling to the telephone the particular person whom *A* wants is a wasteful and serious inroad on the time paid for.

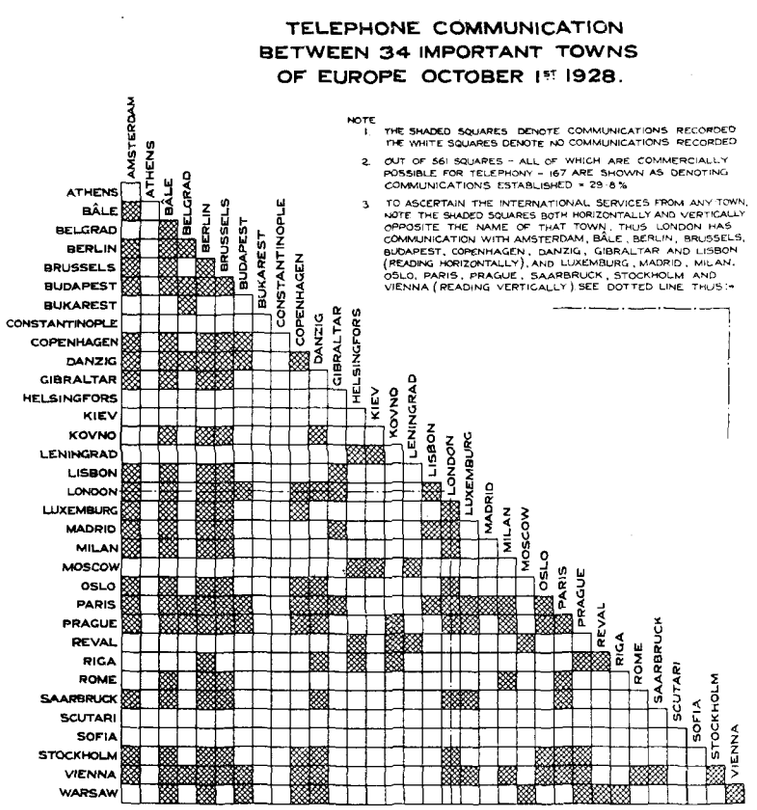


FIG. 6.

The person-to-person service gets rid of these objections; both the persons who are to talk are brought together at the moment of starting the time to be paid for, and the operating organisation receives an enhanced fee for the additional work it has to do.

At present Europe has in places, not with England, however, a service called préavis, which is a "sort of" person-to-person call. But it is not the real thing as you have it on the transatlantic service.

There is so much unprecise use of the words "subscriber" and "line," that in considering this kind of service it seems well to pose a case and to test any service offered on this case. Assume, then, a person A, from an extension on Holborn 1234, in London, wishes to talk with person B, who will be found on an extension on Carnot 5678, in Paris. The time to be paid for is not to begin until A and B are in conversation.

The complete préavis service is made up of two calls, a preliminary notice, the préavis, sent over the Trunk and given by the incoming Trunk operator to the wanted number, to the effect that a call will shortly be coming from (in the above case) London, and that B will be asked for. If B will be ready (and for our present purpose we need not follow other variations), the call proper will mature and be treated very much in the ordinary manner. Thus the préavis is the preliminary notification, it bears a separate fee which

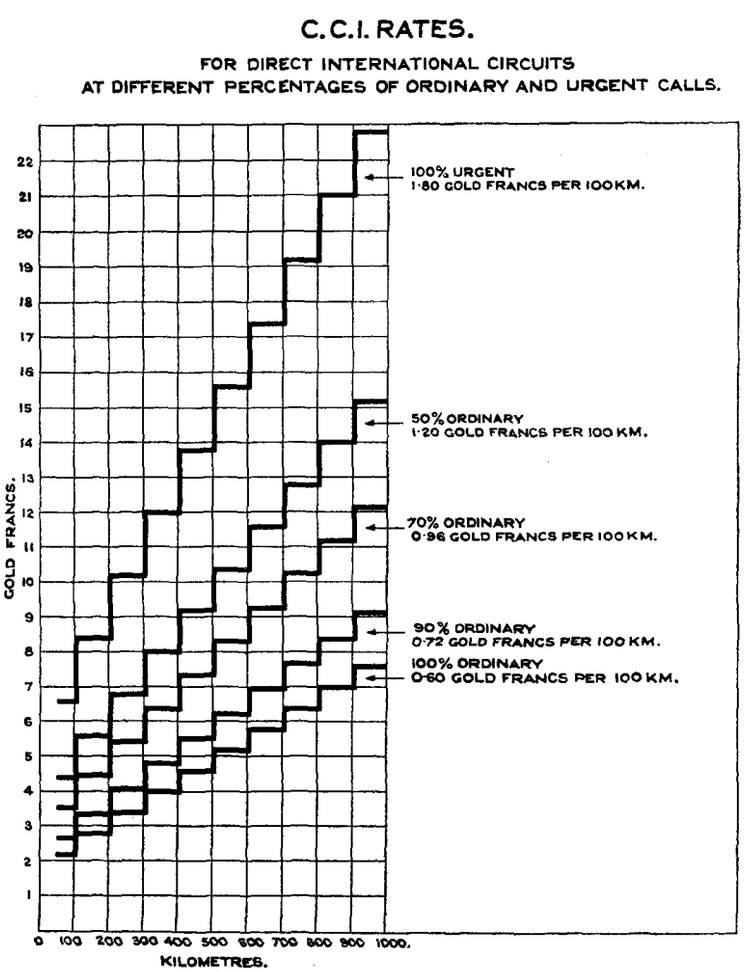


FIG. 7.

is based upon the unit fee, and it is followed by an ordinary call. In actual service the préavis practice differs. Sweden, in its connections with Norway and Denmark, puts the names of the two individuals on the ticket and when the call matures the operator gets these two persons into conversation before starting the time to be charged. But other countries do not go so far; they seem to be content with getting the two P.B.X.'s into connexion and start the time to be paid for from that moment. In fact, the actual call is an ordinary call with no precautions, except that when each of the two stations, or P.B.X.'s, reply, they are given the name of the individual wanted and the name of the distant town.

Substantially, Europe does not at present enjoy a person-to-person service, and with the increasing length of international lines this facility seems overdue. In considering the future of this kind of service, three statements seem likely to be true:—

The longer the connexion the greater the demand for person-to-person service.

The greater the person-to-person service the greater the demand for speedy service.

The more speedy the service the greater the likelihood of the préavis type of call being abandoned.

Since writing the above, I learn that the British Post Office has already made proposals for a real person-to-person service, and I hope that its efforts will be successful.

UNUSED FACILITIES.

If we consider 4 wires giving telephone service on 2 channels, by means of suitable terminal arrangements and by proper transposition of the wires, we can make a third circuit without adding any more line wire, and the longer the line and the heavier the wires the more desirable economically does this third circuit become. In nearly all toll cables and on most open wire circuits this creation of a Phantom circuit is commonly employed.

But there are other facilities which at present are unused on international lines in Europe, although they offer great attractions. The same four wires, if of open bare wire construction, can, without robbing the telephone income in any way, also provide four independent two-way telegraph circuits, while if in cable there may be added two independent two-way telegraph circuits.

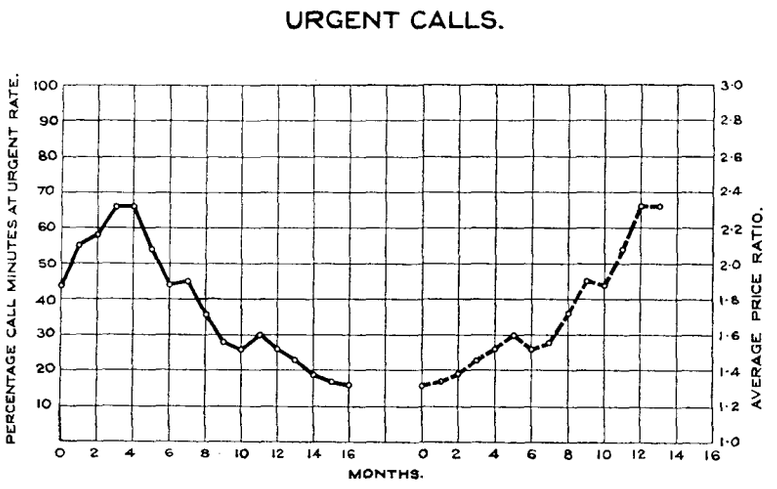


FIG. 8.

Fig. 10 shows in circles the three telephone rentals collectable from four open wires, these are very generally used. It further shows in squares the 4 telegraph revenues which may also be collected from the same wires and these last are practically neglected in Europe.

Fig. 11 shows in circles the three telephone rentals obtained from four cable wires and the two telegraph rentals which are being neglected. The illustration is for two-wire telephone circuits, the same telegraph revenues are possible if the telephone circuit is a four-wire one.

Again, on open wires, without detriment to the ordinary telephone rentals, we can, by carrier, add three other conversations simultaneously and thus in many cases increase the income-earning power of a pair of wires from $1\frac{1}{2}$ to $4\frac{1}{2}$, and with the two telegraphs, to $6\frac{1}{2}$ rentals, or on the same pair and without injury to the ordinary telephone rentals, we can add 12 two-way telegraph rentals, 10 being by carrier and two by composite apparatus. Or again, in a telephone toll cable which has spare circuits available, by giving up telephony on one pair, we can provide for six two-way telegraph rentals.

Now, since all these arrangements are made by apparatus, it is approximately correct to say that their attractiveness increases with the length of the line, and yet surprisingly little use is made of these facilities, even though the number and length of long lines is growing rapidly. The London—Madrid circuit is one of the very few such cases within my knowledge; in this case a pair of open wires between Versailles and Zaragoza, in addition to the ordinary telephone circuit and half a phantom, carries three telephone carrier channels with their accompanying rentals, and it could also carry two telegraph composite circuits.

There is another case between Copenhagen and Hamburg where two extra telegraph circuits are provided by composite. I understand also that there are some voice frequency telegraphs used on international telephone circuits in France.

Now more or less throughout Europe the Telegraph Departments are in financial difficulties, suffering from the competition of the telephone. Is there not in these extra facilities a means of reducing the annual cost of lines; may it not even be economical to cut down existing telegraph lines and use telegraph circuits which can be provided at little extra cost and be utilised either in the public service or leased as private wires at attractive rates. If, for example, at a cost which relatively is low, it is possible to operate 12 two-way telegraph circuits between, say, Paris and Vienna, over a four-wire telephone circuit, is it not possible, by suitably adjusting the rentals charged, to build up a profitable business by the use of these neglected facilities?

Possibly the fact that the long lines of Europe pass through more than one ownership is one reason why, apparently, no one seems to feel the urge to make the most of these long lines. Or it may be that there are difficulties in the fact that frequently there are practically two departments, the telephone and the telegraph, which have to see eye to eye before these facilities can be employed. But it does seem that full use is not being made of the money which has been expended. Perhaps this is a matter on which the C.C.I. (Telegraphs) could do good work.

THE FUTURE OF INTERNATIONAL TELEPHONY IN EUROPE.

Why do we use the expression International Telephone Service as if it were something special and different to ordinary long distance service? The answer is one of organisation. In ordinary long distance service, the whole toll circuit and frequently both local ends are in the hands of the one administration, responsible for all the arrangements and in a position to take at short notice any action it may judge necessary.

But in the International service a Toll circuit belongs to and is operated by at least two authorities; there may be several more. Each of these authorities has its own sovereign powers, its own way of doing its work, its ideals of service, technique, hours of duty, costs and manner of charging the public.

A telephone message is not like a parcel or a train, which is handed on from moment to moment and does not occupy very much space at any one time. In telephony, the whole circuit is simultaneously and exclusively occupied with the one call; this should be so constructed, maintained and operated, that its different sections under different controllers are harmonious and operate as one whole.

I confess that I find it a very difficult thing to imagine this harmonious working carried to a high degree of efficiency under the present system of multi-control. Of course, a great deal has been, and undoubtedly in the future will be, done, but there are degrees of efficiency and it certainly seems to me that multi-control can never, with the best will in the world, produce results comparable with those given by unity of control.

The function of the C.C.I. so far, has been to form a common public opinion among the long-distance telephone authorities of Europe as to certain matters, such as specifications for the construction of long lines, rules regarding maintenance and some standardisation of traffic and rating matters, though these two are not as advanced as what is known as the Transmission Section. But in daily operation of the service much more than common opinion or a book of rules is required. At present no one person is in charge of general

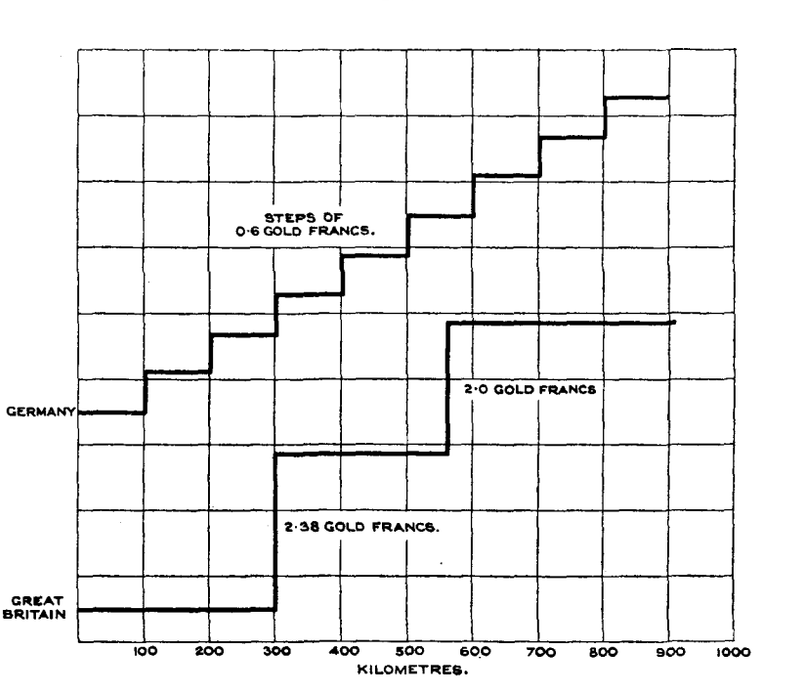


FIG. 9.

policies and decisions; no one is able to lay out new circuits which the traffic requires, nor to make definite programmes and budgets, nor to make schedules for carrying out works. No one can make new rates and services, all these require prolonged collaboration. No one is in charge of the maintenance; a trouble in one control area may cause great difficulties in that of another, without involving any responsibility on the first.

In ordinary business where the work of a number of people has to be closely co-ordinated to produce success, one of the ways of increasing the efficiency is by comparing the results of districts and divisions, and then devoting attention to the places thus shown to be relatively weak; by this procedure eliminating the weak points and progressively enhancing the efficiency of the strong places. This method of comparison is entirely missing at present and even if weak places were known there is no common machinery for strengthening them, nor indeed any single authority to decide what the

treatment should be. Imagine the Trunk service in this country were each large Trunk area independent, and if no observations, statistics or information from each of these divisions came to a single authoritative head and therefore no common supervision; or imagine the maintenance of the plant handled independently by each division without any supervision or co-ordination on the part of some central authority. Imagine none of the comparisons, conferences, schools, special instruction, &c., which are employed to screw up efficiency gradually to the highest point within an organisation—imagine none of these methods employed in your inland Toll service and you form some picture of the International service. In maintenance such matters as studies leading to decreased cost have to be made and the lessons from these studies have to be applied. Examples are comparisons of faults, the length of time circuits are out of order, the number of times circuits are outside their specified transmission limits. In the Traffic departments the comparisons of Toll observations are important. In all these it is not the adherence to prescribed standards that is so important; it is rather the constant striving after better results assisted by comparisons between divisions which causes progressive efficiency and improvements in service, and this gradual development of technique and efficiency among very large numbers of persons is one of the very difficult jobs for many businesses.

In the absence of all these things which flow so directly from unity of control, something, of course, would be done and service would result; but it would need a miracle to give it the efficiency of a service supervised and controlled by a competent central authority.

We know that not much, if anything, is gained by increasing the size of any organisation beyond a certain extent. But the individual nations of Europe are far too small to form the economical units for this service, and I cannot escape the conclusion that, sooner or later, there will have to be found some single unit for the administration of the European International service, unless, indeed, Europe is to rest content with a service relatively much inferior to the plant which she has provided, and I cannot believe that will be the case.

While the first attack on this problem was concerned with physical matters and lay mainly with the Engineering departments, the development which has taken place has shifted the point of attack, which now lies largely with the Administrative and Traffic departments. To-day the problem seems to apply mostly to business matters.

I want particularly to acknowledge the help I have received from Mr. W. J. Hilyer, in dealing with this subject.

COMPOSITE (OPEN WIRE)

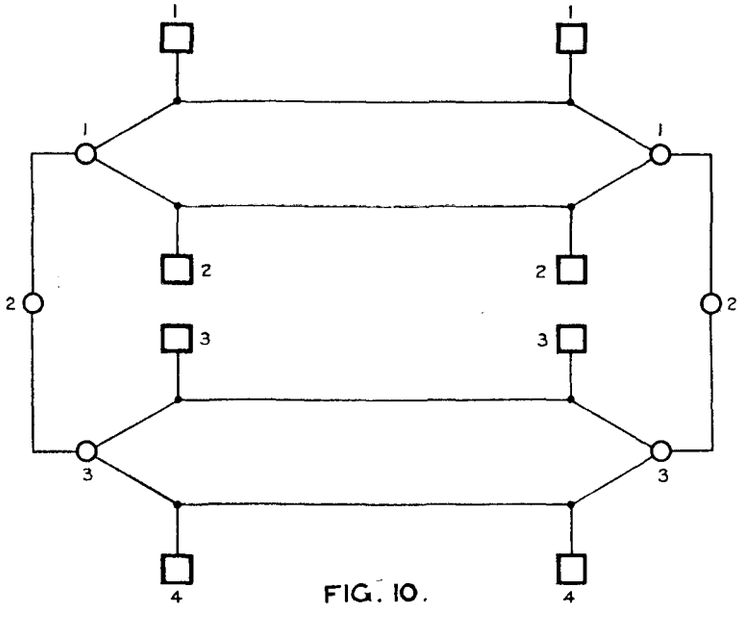


FIG. 10.

Colonel PURVES, in his introductory address, explained that his presence in the Chair was due to the absence of the Society's President, Mr. Stuart Jones, in America, where he was acting as a member of a Commission appointed to study American telegraph methods and practice.

The lecturer needed no introduction to the Society. Mr. Gill's interest in international telephony was well known, and the presence of such a large audience was an indication of his popularity.

An interesting discussion followed the reading of the paper.

Mr. GRANT thanked Mr. Gill for his interesting address and referred to Mr. Gill's outstanding position as a telephone engineer and enthusiast. He commented on Mr. Gill's modesty in not mentioning in his address the great part which he (Mr. Gill) had taken in the formation of the International Consultative Committee which was now functioning so actively and fruitfully in the interests of international telephony. The telephone theory and practice of the British administration coincided so closely with Mr. Gill's own ideas that such criticisms as were contained in the paper could scarcely be regarded as applicable to the Post Office. It was possible, however, that Continental administrations might feel that they had not been given sufficient credit for the rapid developments in international telephony which had taken place during the past few years. The number of services had admittedly been considerably increased and the standard of service had been much improved, especially as regards transmission and delay. The delay figures quoted by Mr. Gill were in some cases out of date. Greater progress still would have been made but for the war.

COMPOSITE (CABLE)

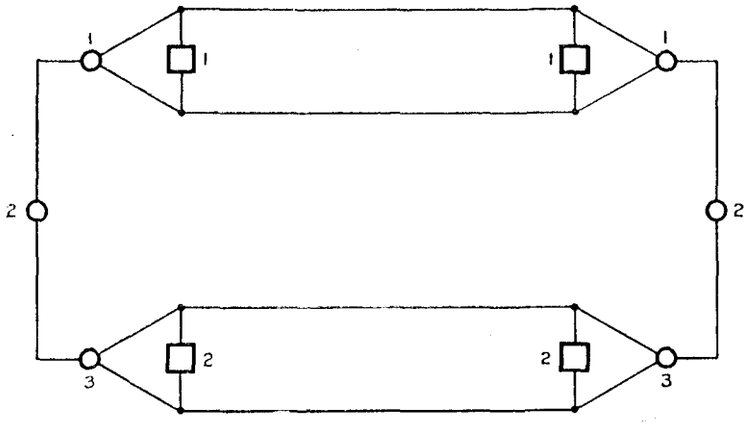


FIG. 11.

The standardisation of service and operating practice presented great difficulties and required careful consideration. In the desire to make progress rapid there was a real risk that low standards might be accepted to meet the requirements of other countries.

Mr. VALENTINE spoke of the thought-provoking and stimulating inaugural address which Mr. Gill gave before the Institute of Electrical Engineers almost six years ago on International Telephony and of its reactions on the minds of men and telephone authorities. He also spoke of Mr. Gill's divine discontent, his plea for further progress in the development of long-distance telephony and of the need for some form of unified control.

Mr. TRAYFOOT considered that the problems of the administrative and traffic staffs in connexion with international telephony were more difficult to deal with than those of the engineering staff. In engineering matters, principles were of very recent origin and were more or less standardised already.

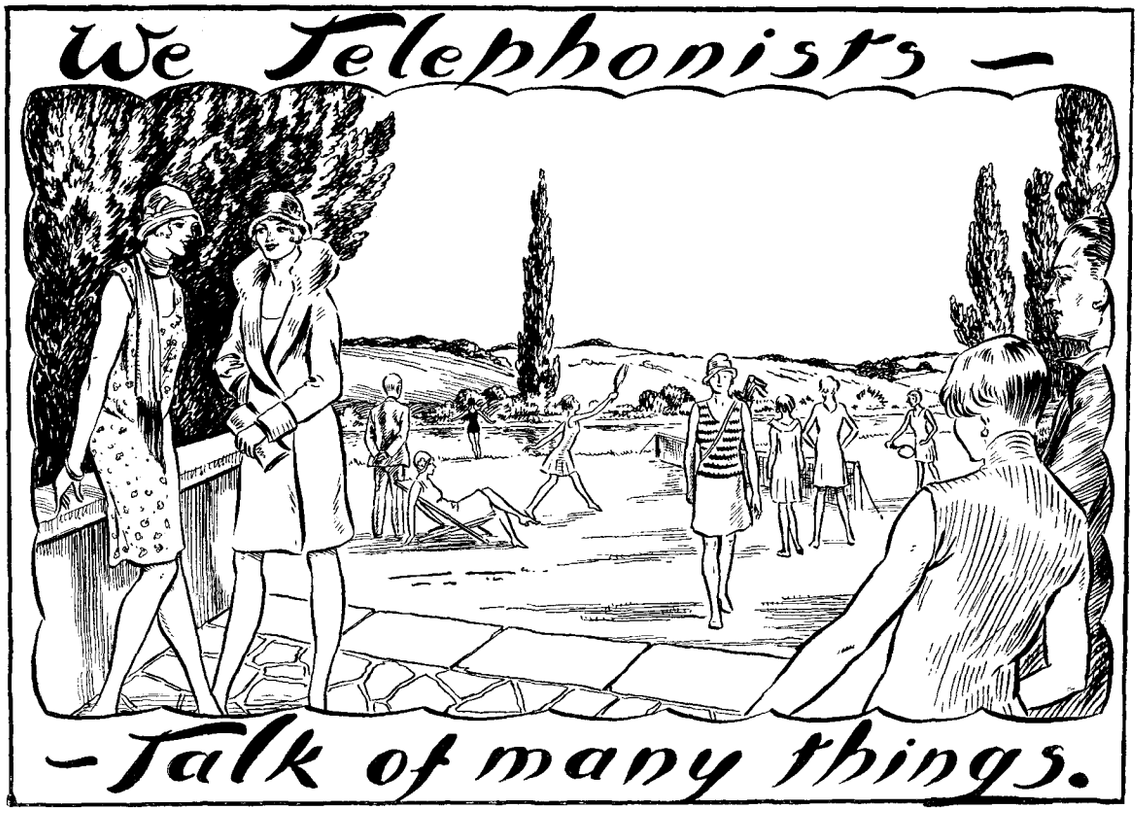
This was not the case in administrative and traffic matters. Each country had services and operating practices of long standing which suited its particular requirements and was reluctant to make changes for the sake of ensuring uniformity. Sub-committees appointed by the C.C.I. are already dealing with the more important matters and some measure of progress is being made. Among other matters a scheme for a person-to-person service had been formulated and was awaiting the concurrence of the various administrations. Regulations for the operation of traffic to and from Stock and Commercial exchanges had been drawn up after the Sub-Committee had studied on the spot the conditions at Stock Exchanges at a number of capital cities, and these were being brought into operation.

Mr. PINK pointed out that in the diagram showing the services existing between the larger cities of Europe and the developments which were possible in this direction, no indication of the community of interest between the various cities was made. In gauging the progress made so far and the future necessities some such information was desirable. He mentioned that in London 70% of the calls regarded in America as Toll calls are connected while the subscriber remains at the telephone, as compared with the American figure of 90 for 1927 mentioned by the lecturer and that it is expected that the London figure will, before many months, be increased to 77%.

He also urged the possibilities of increasing the number of channels by the use of the carrier system on international circuits, particularly for meeting temporary traffic pressure.

Colonel SHREEVE stated that the excellent Toll service which was given in America was in large measure due to the fact that the whole system was under one control. He thought that more use should be made of the facilities afforded by composite circuits.

Mr. HILYER and Mr. DAY also spoke.



"Heigho, Come to the Fair."

"ONE man in his time plays many parts"—so wrote Shakespeare. Just at present I am a herald. I am not a herald angel—they sing and I should fail in the voice test—nor even a town-crier, with a Bacchic countenance, a large bell and a grater voice. Neither am I a herald of the dawn—I could not rise to that. No, I am one of those picturesque heralds clad in a tabard—the sort of Wireless Uncle they had in mediæval times when there wasn't any wireless, because everybody was wireless. Oyez—I mean, oh yes, that's the sort I am—charged all proper with halidoms and quantities of bodikins (gules and or) and withal extremely vert. And I have just blown a blast on my trumpet, which is another way of saying, "Friends, Romans, Countrymen, Lend me your ears."

Very well then, "Unto all whom it may concern, Greeting." I want to tell you about the Christmas Fair which is being organised with the object of endowing a bed in the Elizabeth Garrett Anderson Hospital for Women. Now it's not a bit of use you saying that you know all about it because you don't, and even if you do, it won't stop me, now that I've started. The Fair is being held, very appropriately, in the Memorial Hall, Farringdon Street, on Friday and Saturday, Dec. 7 and 8, 1928. It opens at 3 p.m. on Friday and at 2 p.m. on Saturday. The price of admission is hardly worth mentioning, but, as a matter of passing interest, I may say that from 2 p.m. to 5 p.m. on Friday, the charge is 1*s.*, and that thereafter, and all day on Saturday, 6*d.* will see you safely in. The cost of getting out again is left entirely to you, but I understand that the organising committee would be tickled to death if you had to walk home each day.

Once inside the Fair you will find a remarkable range of goods for sale. Each Traffic District as well as F.E.S. and the School has its own stall, and the merchandise of each varies as follows:—

East District	...	China (naturally from the East) and glass.
E.C. "	...	Leather goods (even the unsoled must be sold).
N.W. "	...	Household goods (mousetraps! Well, may be!)
South "	...	Haberdashery (ribbons and—er—sew on).
Trunk "	...	Toys (elephants, of course—Trunks you know).
West "	...	Refreshments (East is East but West is Best).
W.C. "	...	Household linen (for Bride and Bridget).
School "	...	Sweets (sugarstick, but not lipstick).
F.E.S. "	...	Christmas gifts (with possibly an odd promotion or a P. 18).

In addition there is to be a Christmas Tree, a real Gold Mine, Houpla, and Fortune Telling. Continuous Dramatic Performances and Concerts will also be provided.

It needs no words of mine to commend the Christmas Fair—the worthiness of the cause is sufficient. The Hospital was founded in 1866 and is run exclusively by and for women. It was, I believe, the first of its kind. During the three years 1925 to 1927 over 26,000 patients received treatment, but lack of money has necessitated a drastic curtailment of its activities. A relatively large sum of money is needed to endow a bed, but "We Telephonists" (with the help of male and female colleagues) can easily secure the necessary amount. The needs of the Hospital are a challenge to women. Having launched the Christmas Fair, let us all support it to the utmost of our ability. Every penny spent at the Fair on Dec. 7 and 8 will help to relieve the distress of a fellow creature. Money saved up to Dec. 6 will help to save lives after Dec. 8.

Well, good-bye—don't be late—meet you under the clock.

PERCY FLAGE.

City of Laughter, City of Tears.

November is probably one of the dreariest months of the year, but it has two outstanding events, which take away from its monotony, and combine all the elements of humour and pathos.

Please to remember the 5th of November,
The Gunpowder Treason and plot;
For I see no reason, why gunpowder treason,
Should ever be forgot.

Who does not feel a thrill at the words of the old rhyme, and how one's memory goes back to the days of childhood: to the huge bonfire, and the crackers; the Roman candles, and the sky-rockets. Better still, if one has nephews or nieces, who cannot still join with zest in holding "sparklers" and "coloured lights" or feel thrilled when a "chrysanthemum" or "coloured flower pot" bursts into flame! It is very amusing to see all the different "Guys" that are wheeled about the streets, and even though the collectors are somewhat too pressing at times, such a remark as "Just a farthing for luck, lady!" is not without its humour.

But life does not consist of fun, as we all know, and the next Celebration which takes place is a very solemn one, and one which touches the hearts of all. Armistice Day! What memories it brings back! To some these are more poignant, but to all they are full of sadness, howbeit of triumph. It gives us fresh inspiration to go forward, and fresh courage, and the realisation of how short a time even the longest life is in the light of eternity.

Hope on, brave heart, although the pathway darken;
Pray on, oh soul, amid the busy strife.
Earth is not all, His Angels ever hearken,
Heaven shall make perfect our imperfect life.

L. R.

The latest from the North.

Two taxi-cabs collided in Aberdeen, and 41 passengers were injured.

London Telephonists' Society: First Meeting of Session.

The Moon was shining valiantly,
Shining with all its might.
It did its very best to make
The streets look clean and bright,
Nor was this odd, because, you see,
It was a Friday night.

The cups were chinking cheerily,
The vestibule was packed.
In all that crowd, no head was bowed,
No soul two biscuits lacked—
The simple tea, in short, was free,
Through Presidential tact.

The Chairman and the President
Were sitting near at hand.
They smiled like anything to see
Of girls so large a band.
"If we from each can get a speech"
They said, "it will be *grand*."

"The male staff, too," the Chairman said,
"Are very largely here.
"Do you suppose, from some of those,
"*Much* talent will appear?"
"I doubt it," said the President,
And shed a bitter tear.

"I weep for you," the Chairman said,
"And deeply sympathise.
"But when your task is done, I'll ask,
"Myself, if they will rise."
The President said nothing but
"I fear you're hardly wise."

His speech was made, but none essayed,
To break that silence vast.
No voice was heard, no sound, no word—
The Chairman sat aghast.
"I told you so," the President
Said with a smile at last.

"The time has come," the Chairman cried,
"To talk of many things,
"Of, 'Something to look forward to'
"And whether words have stings.
"Of television, talkie films,
"Of Presidents—and Kings."

"Oh, audience, please talk to us,"
The Chairman did beseech.
"Express your views just how you choose,
"Rush boldly to the breach.
"Announce your name, win lasting fame;
"A speech, a speech, a speech."

At last a speaker bold arose,
With well-turned phrase and neat,
Called, in effect, the President
A name I won't repeat—
And, later, was to wish, in vain,
He had *not* gained his feet.

And soon another one stood up;
And more and more and more,
Some flatly contradicting all
That had been said before,
Or giving reminiscences
From childhood's happy store.

The Chairman (as the President
Replied, unvanquish-ed,
With Puckish smile, though free from guile),
Was seen to shake her head,
Yet could not hide a certain pride,
At what he gaily said.

"Oh, audience," the Chairman smiled,
"The President has done;
"Has someone something else to say,"
But answer came there none,
Which wasn't odd, because you see,
He'd stymied every one!

Mountview Swimming Club.

The first gala of the Mountview Amateur Swimming Club was successfully held on Tuesday, Oct. 9, at the Hornsey Road Baths.

A large and enthusiastic audience witnessed the various displays and races by the seemingly untiring competitors.

The nightdress and costume races were the cause of much fun and laughter, while the obstacle race held everyone at "high tension" as to who would overcome the elusive tin-can. The polo match, ornamental

swimming display, and exhibition diving by the A.D.A. team, were three features which were highly applauded.

The club championships were won by Miss Burrett (100 yds.) and Miss Spicer (50 yards).

Miss Tringham kindly presented the cups and prizes to the various winners, and gifts to the helpers and organiser of the gala. Then, amidst loud applause, the club champion presented Miss Tringham with a bouquet of carnations, but owing to the lateness of the hour all conventional speeches were abandoned.

Thus concluded a very enjoyable evening, which it is hoped will only be one of many. F. I. A. N.

Contributions to this column should be addressed THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

GLASGOW TELEPHONE NOTES.

ON Friday, Oct. 12, there was a happy gathering in the Glasgow Traffic Office to make a presentation to Mr. J. J. O'Rourke, Assistant Traffic Superintendent, on the occasion of his marriage. The gifts consisted of a fine overmantel and an electric iron, and were presented on behalf of the staff by Mr. A. E. Coombs. Mr. E. J. Johnson and Mr. A. E. Higgins also spoke and Mr. O'Rourke responded in his usual happy manner.

So Mr. J. G. Mackay, Assistant Traffic Superintendent, has at last severed his official connexion with us. With the exception of two days in August, John has been on sick leave since July, 1926. We all trust that in his retirement he will recover and maintain his health for many years to come.

A "Turner" for a Penny.

I boarded a Dennistoun-bound tram at Queen Street Station and procured a seat at the back, outside. "A penny one, please!"

And as I looked westward my penny rapidly grew with compound interest to hundreds of pounds, for as the car sped on I beheld a beautiful picture. The November sun was sinking in a blaze of red and gold behind a vista of domes and spires that stood out against the sky; and as the grey evening mist crept up and distance gave me a longer perspective, I seemed to visualise the kind of scene which Turner must have enjoyed so often and has portrayed so wonderfully.

I felt that my "pennyworth" had helped to give me an appreciation and a better understanding of the great artist's work.

M. L. TULLOCH.

A Toast.

"THE LADIES."

A toast like this
No man must miss,
For it were bliss
The cup to kiss—
It were remiss
The Miss to kiss,
And cup to miss—
To miss the kiss
Of cup or Miss
Would mar the bliss
Of toast like this!

M. L. TULLOCH.

On Mistakes.

"The supreme ideal is the worthy attainment of a reputation for infallible accuracy. The possession of an active intelligence would rid the Office of its greatest curse—the mistake."—*National Telephone Journal.*

"The Post Office does not adopt an attitude of infallibility."—P.O. Circular.

"I learned in my early days that the great thing about the Post Office Service was *to get things done, even though they might not* be done in the best style and with the greatest accuracy. Then I learned that you must cultivate style and accuracy."—L. T. Horne.

"No bricklayer builds a wall perfectly perpendicular, mathematically *this is not* possible; a certain degree of perpendicularity suffices him; and he, like a good bricklayer, *who must have done with his job*, leaves it so. And yet if he sway too much from the perpendicular, he and his wall will rush down into confused welter of ruin."—Carlyle.

"It is not easy to be exact; it is easier, alas! to be inexact. It is by careful method and minute, unwearying attention that men rise even to material exactness even of external and constant things."—R. L. S.

"There are a hundred ways of going wrong, but only one of going right."—G. K. Chesterton.

"In view of the number of errors shown to be possible one wonders not why there are so many discrepancies but why there is so much accuracy."—G. F. Bateman.

"Protect me from the man who never made a mistake."—Senator Beveridge.

"The only people, scientific or otherwise, who never make mistakes, are those who do nothing."—Huxley.

"The man who never makes any blunders will never rise in the esteem of the world above the reputashun of a guide-board."—Josh. Billings.

"You never know the real character of a man or woman till you see how he or she takes being found out in a blunder."—Anonymous.

Obituary.

We regret to announce the death, on Oct. 13, after a short period of three days' illness, of Mr. John Galt, a Clerical Officer in the District Manager's Office, Glasgow.

Whilst he had not been in his usual health for some weeks, his sudden and unexpected demise came as a shock to his many friends and colleagues.

Born in 1866, he entered the service of the Glasgow Corporation in 1901, was transferred to the Post Office in 1906, and was expecting to enter into retirement within the next few months.

Of an unassuming and kindly disposition—cheerfully philosophical—and with a humour which left no barb, to those who best understood him John Galt belonged to that fine and rare company of men who do not fret or fume. To meet him in the path did one good for the rest of the day. His quiet voice acted as a ventilator, lightening the air, and he carried about with him a never-failing anodyne for unrestful if more robust minds. No disappointment seemed able to disturb him, and whilst we now think he must have been aware to some extent of the incurable nature of his disease, he carried on uncomplainingly right to the last with the blessed calm of a May morning amid many distractions.

We think he was one of Wordsworth's quietly heroic souls:—

"We men who in our morn of youth defied
The elements, must vanish: be it so!
Enough, if something from our hands have power
To live, and act, and serve the future hour;
And if, as toward the Silent Land we go,
Through love, through hope, and faith's transcendent dower,
We feel that we are greater than we know."

Mr. H. Murray and Mr. E. Wright represented the District Manager and Staff at the funeral, which took place on Oct 16.

J. L.

NEWCASTLE TELEPHONE NOTES.

The Exchange Swimming Club, which was formed this season, held its first Annual Gala on the evening of Oct. 5, and was pronounced a huge success.

It would have been strange indeed if success had not rewarded the hard work put in by the Club Committee, together with the enthusiasm and support which the venture received from the officials and staff of the exchanges and District Manager's office, to whom the thanks of the Club members and the delighted Gala audience are due.

If at times the bath's premises rocked on their foundations with the force of the full-throated exhortations to "Come on, Central!" "Stick it, Trunks!" "Buck up, Billee!" &c., &c., causing the District Manager, Mr. J. D. W. Stewart, in his presidential address, to express the opinion that some members of the audience should do well in a plunging competition, judging by their power of lung—it was only a further evidence of enthusiasm and augured well for future support.

The humorous interlude afforded by the life-saving display which took a most novel form included a jilted lover, followed by a sensational attempt at suicide and a subsequent forced rescue by the repentant lover, and a very human episode of a "couple o' kids" playing boats, the inevitable falling in of one and plucky rescue by the other (all in full dress) was deservedly well received.

The Club trophies—a silver shield for the Club Championship and a silver cup for graceful swimming, were won by Miss Alice Beattie and Miss Rita Farquharson, who hold them for one year. The Club handicap was won by Miss Millie Routledge.

A social is to be held later at which prizes for other events are to presented by Miss E. M. Holt—Supervisor of the Trunk Exchange. J. H. W.

The first Telephone Staff Dance of the season is being held in the Heaton Assembly Rooms on Nov. 9.

THE

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CONTENTS.

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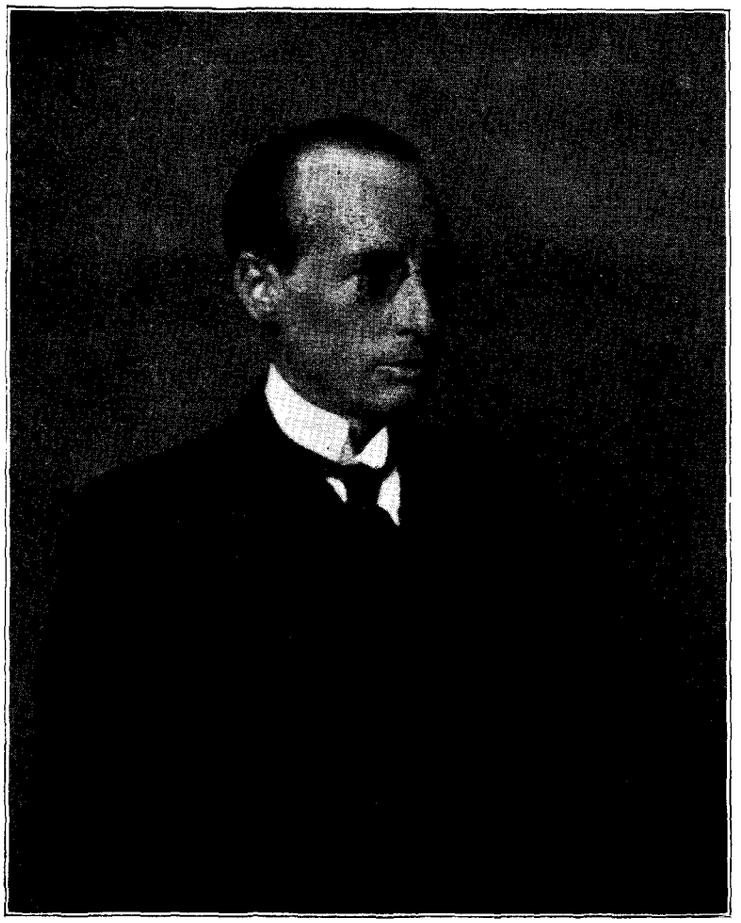
TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LIX.—
COMMANDER E. L. C. GRATTAN.



[Photo by J. Russell & Sons, Baker Street.

WHEN Mr. Wadley retired from the post of Assistant Controller (Foreign) in the Central Telegraph Office last September he was succeeded by Commander E. L. C. Grattan, D.S.O., late of the Royal Navy. It seems a long cry from the sea to the Cable Room. He started his career on the sea, and he is now grappling with the conditions under it and over it. Under it by cables, and over it by wireless. And his qualifications are eminently suited to all three.

Commander Grattan was born in Ireland in 1884 and entered the Navy in 1899, but even then he was not satisfied with the surface of the sea as in 1896 he became an officer in the Submarine Service. He survived, and we find him at the outbreak of war in a wireless appointment at the Admiralty, with the rank of Lieutenant Commander. In 1916 he was on wireless work in the Mediterranean, and at Gallipoli was twice mentioned in despatches and awarded the D.S.O. Two years later he returned to the Admiralty, with the rank of Acting Commander, and was put in charge of the Naval Shore Wireless and Signal stations in this country.

He retired from the Navy in 1921 and was appointed Assistant Inspector of Wireless Telegraphy in the Post Office. After three years at Headquarters he proceeded to Egypt to take charge of the Post Office wireless station at Abu Zabal. Meanwhile the beam wireless services had been opened, necessitating an increase in the Cable Room staff, and Commander Grattan was appointed Superintendent, Higher Grade, on the Cable Room staff at the beginning of this year, and was promoted to Asst. Controller in September.

Commander Grattan, since his arrival in the Cable Room, has naturally been specially concerned with the development of the beam wireless services, but as we do not know his views on the new merger scheme, we cannot publish them, and perhaps it is just as well. But merger or no merger, we all join in wishing our new Assistant Controller every success in the future, which we can indeed confidently predict from his attainments in the past.

NO-DELAY BASIS TRUNK AND JUNCTION SERVICES.

RECOVERING THE WASTE.

BY C. W. DAVIES, *Assistant Traffic Superintendent, Bristol.*

A SPEEDY means of communication at all times between one exchange and another is one of the aims of an ideal telephone service. Within recent years considerable development in this direction has been effected, so that it is now possible to obtain a no-delay basis service to exchanges within a wide area about any given exchange. Indeed, so rapid has been this development that the majority of the junction and trunk circuits at present in use are operated on a no-delay system.

Unfortunately, the words "ideal" and "no-delay" bear little compatability with such words as "financial considerations," but both bring considerable pressure to bear in considering the adequacy or otherwise of any group of circuits. Briefly, the relation is this :—

Financial considerations impose definite limitations to the number of circuits which will economically carry any given volume of traffic without congestion ; and, in order that these limitations shall not exert an adverse effect on the standard of service afforded by any group of circuits, steps must be taken to see that the group is worked to its fullest revenue-earning capacity.

Experience shows that this capacity is not always reached ; with the result that calls, and hence potential revenue, are either lost or deferred, and additional expenditure incurred in operating complications and in dealing with dissatisfied subscribers' complaints. Clearly, the chief reason for this loss is due to waste time on circuits ; any recovery of which is satisfactory to all parties.

The main sources of this waste time are these :—

(*a*) Maintenance Defects.
(*b*) Delays in Answering and Clearing.
(*c*) Inaccurate Timing of Calls.
(*d*) Miscellaneous Sources, i.e. Circuits Engaged, No Reply, &c.

Maintenance Defects.—Wherever an exposed overhead pole-line exists, there will occur a large percentage of the faults on the circuits it carries. Certain it is that the majority of stoppages on trunk and junction circuits are attributable to this defect. There is no doubt that all associated with the Trunk Service fully realise this and make due allowance for the fact that the English climate does not conduce to uninterrupted service on circuits constructed throughout all or part of their routes by overhead wires in exposed positions. Even after this factor has been taken into consideration, however, it would appear, to one not fully conversant with the administration of maintenance staffs, that there is still room for improvement in reducing delays in clearing faults and in preventing the recurrence of faults day after day. In addition to any saving which might be effected in the treatment of actual faults, a reduction in the number and duration of the stoppages occasioned by men working on routes carrying working lines would undoubtedly be of assistance in increasing the revenue-earning capacity and in reducing the maintenance charges of the circuits concerned. A considerable amount of lost time emanates from this source, and to augment this loss further expense is sometimes incurred in sending linemen to attend to faults brought on by a gang. An engineering officer is clearly the man who could throw further light on this aspect of the case, but assistance can be rendered by the operating staff. It is here that the system of routine testing, properly applied, will bring forth fruitful results. A report of every defect thus discovered, even though it may not be so serious as to stop the service on the route concerned, would tend towards improved maintenance conditions. It might happen, of course, that there would be an increase in the number of faults reported on the more exposed routes, but once the route has been put into a proper state of service, these should diminish. Early morning routine tests are essential so that the Engineering Department may be enabled to give the earliest attention.

Delays in Answering and Clearing.—The detection of delays in answering and clearing calls is frequently a difficult problem. Very often such delays are not brought to notice until the calls in question have been completed, and by the time enquiry can be made most of the facts have been forgotten.

In the Service Inspector's Tests, there is a column "B" "Telephonist Answered." In this column is entered the speed of answer of the telephonist at the first exchange after the originating exchange through which the call is circulated. A speed of answer of 5 seconds is aimed at on "A" calls. As similar operating conditions obtain on jack-ended "B" circuits, there is every reason to assume that the same objective should be attainable on incoming junction calls. Allowing for the application of the "Engaged" test and the selection of the junction at the originating exchange, an average figure of 8 seconds in the "B Telephonist answered" column would not be unreasonable.

For the past six months it has been the practice in the Bristol District to summarise these figures and pursue the results with the exchanges concerned. In consequence, it has been possible, at four fairly important junction centres, to reduce the average speed of answer on jack-ended "B" calls from 19 seconds to 10 seconds. This difference of 9 seconds represents a saving of 0.15 minutes average holding time per call. Although this reduction may appear to be slight, a scrutiny of the Standard Junction Loads will show that no small increase in efficiency has been achieved. This saving will be more readily appreciable when the effect on say a month's traffic is considered. Two of the exchanges handle approximately 1,000 incoming calls daily.

It might be argued that representative results are not easily obtainable from Service Tests when only 6 months' figures are considered. I must admit that there is some truth in this. It is difficult to say what number of tests will give representative operating data, probably no fewer than 500. Herein the above statements are open to question. The number of test calls on which the cases have been pursued is nothing like so many as 500. This view does not affect the principle of the scheme, however, and even though only a few tests may be available for consideration, their pursuance at the time with the staff concerned should tend towards improved service.

Engineering facilities have rendered junction working so rapid as to reduce delays in clearing to negligible proportions. Automatic signalling exists on practically every no-delay basis junction and trunk route, and the improved operating conditions afforded by it give little ground for repeated failures to clear circuits promptly. Difficulties are however encountered when subscribers connected to magneto exchanges fail to ring off at the termination of calls. Magneto systems still figure prominently in the Bristol District, and increased holding time on junctions occasioned by delays in clearing them has been found to be due, in the main, to this defect. At one time the irregularity obstructed the working of the Bath—Bristol local trunks to such an extent as to be a real source of trouble. The subscribers giving the greatest offence were approached and improvements were thereby effected. The matter is, however, one which requires constant attention. Periodic records at the exchanges where the irregularity is most apparent furnish reliable data in deciding the most profitable course of action. A personal visit or conversation by telephone with subscribers will usually rectify any irregularity on their part.

Timing of Calls.—Whatever waste may be debited to subscribers' irregularities, that incurred by the Department itself may easily reach immense proportions unless a close watch on the activities of its officers is kept. In this respect the efficiency of the Junction

and Trunk Service is liable to no small detriment; especially at exchanges where Service Observation facilities do not exist.

Subscribers are given to understand that their junction and trunk fees are assessed on the basis of 3 minutes conversation. While it is possible to allow a little latitude on the shorter distance calls during the quieter periods of the day, the Department is fully justified in strictly imposing the 3-minute limit during the busy hours. When we consider that a latitude of 1 minute per call during the busy hour reduces the efficiency of a group of circuits by 25%, and that the revenue accrued during that period is only 75% of that available, the necessity for accurate timing becomes a matter of considerable importance. Further, the delay thus occasioned to other subscribers' calls cannot be ignored.

Service Observation Records, Service Inspectors' Tests, T 45 records, and reports from officers in charge of exchanges, are all sources whereby the state of a route can be judged. Detailed records of the effective and ineffective traffic passing over each apparently congested route are necessary. From these the source of the delay can be discovered. It frequently happens that a number of delayed calls are registered during a period when the actual effective traffic does not come within a reasonable approximation of the load which the route in question is capable of carrying without congestion. These cases constitute waste holding time; some, if not all, of which may be reclaimed by drawing the attention of the staff concerned to the immediate necessity for strict timing and supervision on all calls. It must be admitted that in combined exchanges the standard of accuracy reached may not equal that attained in Trunk Exchanges. Less elaborate timing devices and the necessity for dealing with local and other miscellaneous classes of traffic preclude the possibility of strict accuracy being enforced at all times.

In order that the system may be productive of fruitful results, however, frequent traffic records are essential and any necessary attention should be given without delay. The T 45 form is clearly the main incentive towards subsequent action.

This aspect of the service has been pursued fairly intensively in Bristol, so that it has been possible, in respect of considerably more than 50% of the congested routes, to reduce delays by imposing stricter supervisory measures; thereby increasing the efficiency of the groups of circuits concerned and deferring the provision of additional facilities until such time as increased traffic makes closer supervision abortive.

Miscellaneous Sources.—The excellent articles by Mr. E. J. Johnson in the April issue of the *T. & T. Journal*, and "W. F. T.," in the issue of the following month, treat so thoroughly on the elimination of wastage through "No Reply," "Number Engaged," and other miscellaneous sources, that any attempts to enlarge on their remarks would amount to grave impertinences. The application of the system outlined in those articles would tend greatly towards the elimination of the use of the junction and trunk service for calls which cannot mature by reason of inability to get the wanted subscribers.

What method of ensuring the permanency of any improvement, effected by the pursuance of the courses described above, will be productive of the best results? The operating staff, in the performance of their duty, are working some thousands of pounds' worth of plant, attached to which is other expense, in the shape of maintenance and operating costs, which is by no means insignificant. Some means of impressing upon them the fact that the defrayment of this expense is dependent, in part, on the degree of efficiency to which the apparatus is worked, is desirable. It is certain that the system of treating all cases in official correspondence requires to be assisted in some manner. There is a tendency amongst staff generally to look upon a set of official papers as a rebuke rather than a constructive criticism or suggestion. To ensure harmonious working the destruction of this idea is essential; and, with this end in view, periodic meetings of Supervising Officers and Officers in Charge of Exchanges, presided over by the Traffic Superintendent, are recommended.

This practice has been followed in Bristol for some time. Its influence, judged by the Service Test Records and reduction in subscribers' complaints, has apparently been beneficial, not only to the junction and trunk service, but to the Service generally. The officers have been given an opportunity of seeing the working of the larger exchanges in the District, and as larger exchanges are usually big junction centres, the no-delay service has derived considerable benefit.

Consideration of the Service generally can be given during such meetings; and the possibility of recovering waste in all its branches reviewed. The opportunities for informal discussion of operating procedure generally and for collecting information, on which can be based data for any necessary action, are points which should not be lost sight of.

CORRESPONDENCE.

THE AUTOMATIC MULTIPLEX.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—In that excellent and interesting paper given by Mr. Stuart Jones, on Nov. 19 last, at the meeting of the T. & T. Society, a statement was made that the Murray four-channel multiplex was "the pioneer of the automatic multiplex." This statement is not correct and I feel sure that Mr. Stuart Jones will welcome the correction. According to information given me in 1906 by Monsieur Doumayrou, the then Controller of the C.T.O. at Paris, the automatic transmitter and keyboard perforator was designed in France in the year 1887. The one I saw in use at Paris in 1906, working on a quadruple simplex set was constructed by Monsieur Carpentier, of Paris, in 1903.

As a result of that visit to Paris in 1906 authority was obtained for the purchase of a set, which arrived in London in 1907 and was shown to Mr. Murray soon afterwards, with the result that he abandoned his perforator, which had a feed of half an inch per letter and was used on his high-speed automatic system, and adopted the method of cross perforations with a feed of one-tenth of an inch per letter, as in the French instrument. To the French telegraph service must be given the honour of being the pioneers in automatic multiplex working.

With regard to another statement that the Americans produced a system fundamentally based on Mr. Murray's, I would like to add that the results of the first London—Birmingham quadruple duplex Baudot were published in the *P.O. Electrical Engineers' Journal* in January, 1911, of 50 to 70 messages in an hour on each of the eight channels. This induced the American authorities to write to the British Post Office for some Baudot apparatus, but we had none to spare and at that time we did not construct it.

The request was passed to Messrs. Elliott Bros., who were the agents of Carpentier, and the requisite Baudot apparatus was obtained for America in that way.

The permanent duplex arrangement devised by the British P.O. was also adopted by the Americans as well as by Mr. Murray. They adopted Mr. Murray's re-arrangement of the Baudot code.

The French officials use the term "Anglo-American Baudots" in referring to the Western Electric, Murray, Western Union or other multiplex systems, and I consider that they are correct.

Finally, it may not be generally known that there are many Baudot circuits working regularly at 35 words a minute with the 5-key Baudot hand sender.

I feel sure that these three small corrections to such an excellent paper will be welcomed by Mr. Stuart Jones.

Yours faithfully,

A. C. B.

OUR readers will remember that the Post Office sent a written message to Mars from the Rugby Station at the urgent request of Dr. Mansfield Robinson. It has been suggested that the Martians, being careful folk, did not reply because the message was not sent "reply paid."

TELEGRAPHIC MEMORABILIA.

A MERRY CHRISTMAS AND A HAPPY NEW YEAR TO ALL.

AUSTRALIA.—Mr. William Gibson (Commonwealth Postmaster-General), describing the development of the Australian postal, telegraph, and telephone services in recent years, claimed that the charges were as low as in any country in the world. If Australia had charged the Canadian telephone rates the profit would have been £2,500,000, if the United States rates £2,000,000, British rates £1,600,000, and New Zealand rates £1,000,000. In the last six years £24,300,000 had been made available for capital expenditure, yet the Department had paid its way after providing annually for interest £1,100,000, depreciation £630,000, and superannuation £288,000. Australia, Mr. Gibson said, was now the sixth country in the world with regard to telephone development per head of the population. The completion of the Perth-Adelaide circuit would render possible the longest telephone connexion in the British Empire, namely, 5,000 miles, from Perth, Western Australia, to Cairns, North Queensland.

Probably within a year a wireless telephone system, costing £45,000, will be in operation between London and Melbourne, says the *Sydney Morning Herald*. The Postmaster-General (Mr. Gibson), who made this announcement in the House of Representatives, also stated that at an early date it was hoped to establish a wireless-telephone service between Tasmania and the mainland, and to provide a metallic telephone circuit between Adelaide and Perth. Inquiries were proceeding, he said, to determine the possibility of introducing wireless-telephony services to replace trunk-line services over long distances in Australia, so that the heavy cost of erecting thousands of miles of wire might be avoided.

A Sydney correspondent of *World Radio* reports that a scheme is being worked out between the New South Wales Broadcasting Co., Australia, and the National Broadcasting Co. of America for an interchange of programmes on a basis new in the history of radio. The idea is for each station to broadcast items alternately, each taking the other's items and rebroadcasting them in between. Each station would transmit on two wavelengths: the ordinary wave used for local broadcasting and a special short wave for long-distance work.

BELGIUM.—It has been resolved by the Cabinet to reconstitute the country's telegraph and telephone systems as an independent department, with its own budget, and power, subject to the Government's sanction, to float loans. The new body will take over from the old administration accounts and funds representing the sum of about £30,000,000. Up to 1933 the State will furnish it with the moneys necessary, not to exceed £1,500,000 a year, for extending the field of operations. From and after the year 1933 the department will be expected to pay its way and to hand over to the State 5% interest on the total amount expended by it since the formation of the department. Included in the Government programme is the establishment of insurance and reserve funds. All surplus reserve funds over and above £1,000,000 are to be paid over to the State.

Paul Delandsheere, the Brussels correspondent of the London *Daily Telegraph*, says that Baron Tibbaut, who is President of the Belgian Parliament, "has decided to introduce wireless for the management of the Parliamentary debates. A microphone has just been installed on the President's rostrum, and is connected with two loudspeakers fixed between the colonnades of the hemicycle.

Thus the President will be able to make himself clearly heard when otherwise his voice might run the risk of being lost amidst the tumult of the Assembly. If the Opposition should then attempt to drown his words by their clamour, the loudspeakers, dominating the vociferations of the organisers of uproar, would still enable the President to express himself with authority. . . . On the eve of the reopening of a session which threatens to be a very stormy one, as it will serve as a prelude to the electoral campaign in the month of May, the baron desires to spare himself too many trying experiences. Therefore he has summoned wireless to his aid. If the loudspeakers should prove to be inadequate, he will install a powerful electric bell, the vibrations of which, it is to be hoped, will suffice to safeguard the President's dignity.

With these aids at his disposal, Baron Tibbaut will be able to make as much noise as all the 186 members of the Chamber put together!"

CANADA.—An interesting case bearing on the responsibility for the electrical faults which make accidental deaths possible to those listening in, is reported by the *Daily Mail* as follows: Mrs. Joseph Legault, of Lakeside, Ontario, lost her life while listening to a wireless concert. She was using headphones and turned to switch off the light, when a complete circuit was established through the earth lead with a 2,000-volt power line which, experts agreed, was too near the house. She fell dead and her husband on the other side of the room received a severe shock. The municipal electrician of Pointe Claire said that he believed that high winds caused contact between the high-power line and the aerial, thus closing a circuit. Thereupon the jury, in face of the coroner's instructions to return a verdict of accidental death, held the municipality criminally responsible.

CHINA.—The recent conclusion of an agreement between the National Government and the Radio Corporation of America, says *The Electrical Review*, indicates an effort on the part of the Chinese to end the long controversy on the development of wireless telegraphy in which the United States, Japan, and Great Britain have been engaged. According to *The Times*, seven years ago an American concern, which has since become associated with the Radio Corporation, contracted to install one central and five feeder stations at a cost of $13,500,000 (£2,700,000) on terms which appeared to ensure an American monopoly of wireless in China to the exclusion of other interested countries. The Americans are now apparently content to cancel their former agreement in consideration of receiving an order to install at Shanghai two 20-kw. short-wave plants, at the trifling cost of $170,000 (£34,000). Whereas China a few years ago was committed to spend a great sum for a 700-kw. station, plus subsidiaries, she is now to obtain an installation which will give her equal facilities for communicating with Europe and America at one-eightieth of the price, or with attendant expenses for $350,000 (£70,000), instead of $13,500,000 (£2,700,000). One plant will be used to communicate with California and the other probably with Germany, and both will be completed early in 1930. The Chinese aim at operating their foreign telegraph communications themselves, thus disposing of the monopoly hitherto held by foreigners. The Mitsui contract of 1917 is now virtually a dead-letter, as the station completed at Peking in 1921, at a cost which, with interest and expenses, exceeded £1,000,000, is practically obsolete. Whether Japan can ever recover this amount from China remains to be seen. The British and Danish cable companies' monopoly of telegraphy in China expires in 1930. The interest of the Marconi Company in China, formerly confined to wireless, is now identical with that of the cable companies.

EGYPT.—The London Press recently reported that a wireless telephone message sent by a Vickers-Rolls-Royce biplane, testing locally with Croydon, England, was heard clearly by a flight-sergeant at a R.A.F. aerodrome near Cairo, over 2,000 miles away—a record in long-distance reception from an aeroplane in flight, so it is declared.

FRANCE.—According to *The Electrical Review* the French Post and Telegraph Authorities recently carried out certain improvements at the marine wireless station at Havre, as a result of which it is now capable of communicating with ships up to a distance of 1,550 miles during the day and over 3,000 miles at night.

GERMANY.—The number of broadcast receiving licences issued in Germany reached a total of 2,334,253 on Oct. 1, an increase since July 1 of 50,005.

The Flensburg station, the new Norag relay plant, has begun experimental transmissions. Its power is 1.5 k.w. and wavelength 219 m.

The German broadcasting authorities, on Nov. 15, started an experimental picture service from the wireless station at Königswusterhausen, the Fulton system of transmission being used as in Vienna and London. The times of transmission are from 3.30 to 4 p.m. and from 11.30 p.m. to midnight. The service started in Vienna on Oct. 15 from the Ravag station twice per day. (The Fultograph only transmits and receives still pictures.)

A Berlin policeman on point duty in that city is said to speak fluently in English, French, Bulgarian, Russian, Polish, Swedish, Finnish, Danish and Norwegian, in addition, of course, to his mother tongue. He should at times be worth his weight in gold in an international telephone exchange!

GREAT BRITAIN.—The developments of the Marconi Royalty position are as follows up to the time of going to press, the appeal of the Marconi company, from the Comptroller-General's (Patents) decision being yet to be heard.

From the *Wireless Trader* we gather that as a result of the recommendation of the Radio Manufacturers' Association with regard to the rendering by manufacturers of their royalty returns to the Marconi's Wireless Telegraph Co., Ltd., have been as expected. The recommendation was to the effect that the return should be accompanied by a statement indicating that the royalties had been calculated at the rate of 12*s.* 6*d.* per valve-holder up to Aug. 27, the date of the Comptroller-General's decision in the Brownie Wireless case. Manufacturers who have pursued this course have had their royalty cheques returned by the Marconi Co., accompanied by a letter from them stating that they are advised that the existing licence still holds good, and requesting the payment of all royalties due at the old rate of 12*s.* 6*d.* per valve-holder. The R.M.A. has issued the draft of a recommended letter for use by manufacturers in these circumstances which reads as follows:—

DEAR SIR,

Referring to your letter of . . . . returning our cheque for £ . . . . tendered in payment of the amount of royalty which, as shown on our rendered statement, we make to be due to your company, we have to advise in reply to your demand for a remittance for what you consider to be owing that, in view of the award in the Brownie case recently given by the Comptroller-General of Patents, we cannot be a party to the continuance of the charge of 12*s.* 6*d.* per valve-holder to the Public.

Consequently, we can do no more than notify you that we are holding at your call the amount shown in the statement already rendered to you and have to state that, if any other steps are contemplated by your company, our solicitors are Messrs. Blundell, Baker & Co., 16, Serjeants Inn, London, E.C.4, who will accept service on our behalf.

Yours faithfully,

An alternative draft letter is provided to meet cases where licensees have only rendered a return and have not tendered a cheque in payment of royalties. This alternative letter differs from the one given above only in the wording of the opening paragraph.

Carlisle.—Busy Women and the B.B.C.—At the Annual Conference of Women's Institutes held at Carlisle, it was decided to ask for the women's hour wireless talk to be broadcast in the evening instead of in the afternoon.

Eighty institutes were represented, but only seven delegates admitted to hearing the women's hour. "Working women are too busy to listen in during the afternoon," it was stated.

Middlesborough.—Battery Eliminators again !—The Middlesbrough Corporation has completed arrangements whereby electricity consumers can be provided with wireless battery eliminators on a preliminary payment to the Corporation of £1, with half-yearly payments of £1, completing the purchase in five years. According to the *Wireless World*, the device has been designed by Mr. R. H. Scotson, borough electrical engineer; it can be plugged direct into an ordinary lamp socket, and will feed the anode and filament circuits of any kind of valve set. The Corporation is manufacturing the eliminators itself.

Continental Interference and the B.B.C.—Interference by certain Continental stations having caused considerable trouble to relay stations in this country, the B.B.C. has decided, as an experiment, that in December all relay stations shall broadcast on one exclusive wavelength, namely, 288.5 metres.

It is understood that B.B.C. engineers have made a preliminary inspection of sites for their Northern station in the Barkisland area, near Sowerby Bridge, on one of which a high-power broadcasting station may be erected under the regional broadcasting scheme.

After six weeks' study of United States telegraph methods, a special delegation from the British General Post Office has returned to London. The party consisted of Mr. L. Simon, secretary of the Inland Telegraph Branch, Mr. Stuart Jones, controller of the Central Telegraph Office, Col. Lee, an assistant engineer-in-chief who specialises on the wireless side, Mr. G. T. Archibald, inspector of telegraph traffic, and Mr. A. E. Stone, assistant engineer. The delegation will report in due course to the Postmaster-General.

The visit, it will be recalled, was a sequel to one of the recommendations of the Hardman-Lever report.

There are very persistent Press statements, both in this country and the colonies, regarding a suggestion for linking the British Empire by a wireless telephone service.

Concerning the practicability of such a scheme *The Electrical Review* says: "Investigations commenced some time ago, the idea being to extend the Rugby plant so as to afford direct two-way communication with Australia, South Africa, Canada and India early in 1930. The present transatlantic service is maintained by means of high-power long-wave apparatus, but it has been demonstrated that it is possible to use the Marconi short-wave beam system for telephony with less power. Besides the long-wave channel working to America there has been inaugurated recently at the Cupar (Fife) receiving station a short-wave channel. A special receiving array, or system, for aerials has been erected, but as the wavelength used (which lies between 16 and 32 metres) is so small, the antenna need only be of the order of 60 yards long. A special receiver has to be used for such high frequencies, and successful working has been obtained with the system.

The average daily all-in cost of the Rugby wireless station, says the *Electrician*, including the receiving stations worked in connexion with it, was, from May 1 to Sept. 30, 1928, £383, and the average daily revenue was £397.

The number of wireless licences in force is over 2,500,000. It is not believed that there is any widespread evasion of payment of licence fees, nor that owners of portable sets are more prone to evade their obligations than other members of the community.

The *Wireless Trader* reports that during August last radio apparatus valued at £69,974 (valves £12,617) was exported from this country. The principal market was Australia, whose share amounted to £11,318 (valves £3,917). The value of the goods taken by India and Burma was £11,105 (valves £344), and the next in order was the Netherlands, £6,161 (valves £155). Other important customers were Spain, £4,830 (valves £31); France, £3,781 (valves £8); New Zealand, £2,648 (valves £658); the Irish Free State, £2,575 (valves £1,579); Norway, £2,473 (valves £544); and Belgium, £2,009 (valves £61).

Parliamentary Questions.—On Nov. 8, in reply to questions by Lieut.-Commander Kenworthy, Sir W. Mitchell-Thomson (Postmaster-General) said that he knew of no system which was at present capable of transmitting moving pictures of actual events for satisfactory reception by wireless listeners. He had not refused permission for the use of the British Broadcasting Corporation's stations for television tests. The Governors of the Corporation decided, in the exercise of the discretion vested in them, after a demonstration by the Baird Company which held an experimental licence, that the system did not at present fulfil the conditions which would justify a public trial through one of their stations. He had recently received an application from the Baird Company for further facilities. That application was at present under consideration.

From a report from the British Commercial Secretary at Cairo on the financial and economic situation of Egypt the following paragraph should prove interesting:—

The Eastern Telegraph Company, in accordance with the terms of its agreement of September, 1926, with the Egyptian Government, laid two new submarine cables (making three in all) between Alexandria and Port Said during 1927 to connect with its new underground lines between Port Said and Suez. As a result, however, of the refusal of the Egyptian Government to sanction the request of the company (which was originally put forward in connexion with the terms of the above-mentioned agreement) to lay a cable from Port Said to Haifa, the latter port has been linked up with Cyprus instead, and the consequent effect on the Egyptian Government revenue from external telegraph traffic has had to be provided for in the budget for 1928-29.

From the weekly finance article of "The Electrical Review."—The Marconi market continues to be a centre of lively activity and a good deal of excitement. The Americans are taking an active hand in the shares, and it is said that a good many thousands crossed the Atlantic during the month of October. There is no doubt as to the company having a large American proprietary. The price of the shares has touched nearly £4, New York accepting London's prices when the latter have been put up with a run, and London being a fairly consistent seller to New York.

The London and North Eastern Railway of Great Britain is about to experiment with a new automatic lighting system—which switches the light on or off according to the need of the moment. If darkness falls or the train enters a tunnel, the electric lights will be switched on without human intervention, and when daylight comes again the device switches the lights off.

This device is the invention of Radiovisor Parent, Ltd. In brief, it consists of a selenium cell. Selenium is affected by light and, by an ingenious system in which electrical relays are used, it has been found possible to make the selenium switch electric lights off and on according to whether light is or is not falling on the cell.

GREECE.—It is reported from the Ministry of Communications in Athens than an international competition is being opened for the establishment and working of a radio monopoly in Greece for a period of 20 years. After the expiration of that period all the installations will pass free of charge into the possession of the State; after the lapse of ten years the State may take power to acquire by purchase the whole of the radio equipment. Within three months after the ratification of the concession the concessionaire will be required to form a Greek company in Athens, the share capital in which must be held to the extent of three-eighths by Greeks, and three-eights of the directors are also to be natives. It is stipulated that a central transmitting station must be established in Athens, capable of ensuring "objectionless" reception throughout Greece. The details of the competition are shortly to be published and sent to Greek representatives abroad for public communication, and offers are to be sent in within three months to the Ministry of Communications, Radio Department, Athens.

It should be interesting to follow the history of "*objectionless* reception"!

The *Electrician* adds that some of the artistes employed may be foreigners.

HOLLAND.—*Herrings and Radio* !—Reuter's Amsterdam Agency records that increasing numbers of Dutch herring fishing boats are being equipped with simple wireless installations for picking-up wireless broadcast information regarding prices, suitable fishing grounds, metereological reports, &c. Already one-third of the steam and motor luggers are equipped with the necessary receiving sets, the cost of which is small compared with their utility. To judge by the results achieved to date, it is not too much to anticipate that, if not all, at least the large majority of Dutch herring fishing boats will be similarly equipped in 1929.

A new short-wave c.w. transmitter, with call sign PBF5, is now operating from Eindhoven on a wavelength of 41.3 metres. The station is intended for communication with amateur stations throughout the world, and anybody who hears this station is requested to communicate with Philips Lamps, Ltd., says *The Electrical Review*.

Mr. J. M. Baird is reported to have reached an agreement with the Dutch wireless authorities to transmit television images from their station at Scheveningen. A State transmitter is said to have been placed at the disposal of the Dutch company holding the rights of the Baird apparatus. Transmission will be, it is said, on a wavelength of 1,470 metres.

Reuter's Amsterdam Agency states that radio-telephone communication *between special studios* in Amsterdam, Rotterdam and The Hague, and the Dutch East Indies, are to be opened to the public on Jan. 7. Thirty florins will be charged for an ordinary conversation of three minutes, 60 florins for an urgent call, and 120 florins for immediate communication. Ordinary and urgent conversations will have to be booked on the previous day before 6 p.m.

INDIA.—Mr. Eric Dunstan, general manager of the Indian Broadcasting Company, and a number of other European members of the staff recently resigned owing to disagreement with the board of directors on questions of policy, says the *Daily Telegraph*. Mr. Dunstan was one of the early members of the B.B.C. staff in London. His efforts to build up a successful broadcasting system in India have, however, been largely hampered by lack of funds.

The *Financial News* further reports that Marconi's Wireless Telegraph Co., Ltd., has consented to finance the Indian Broadcasting Co., whose prospects hitherto have been so unsatisfactory, resulting in the recent resignation of five of the leading members of the European staff, including Mr. Eric Dunstan, general manager. Mr. Sultan Chinoy, a director of the Indian Broadcasting Co., has just returned to Bombay from England, where he appealed for support for Indian broadcasting on the ground that the Indian Radio Telegraph Co., which is associated with the Broadcasting Co., would suffer.

The latest and more reassuring news is a message from Reuter's Agency at Bombay, which reports that the Indian Broadcasting Company has now

announced that broadcasting in India will be continued, and that every effort will be made to make the broadcasting a success.

IRISH FREE STATE.—The Dublin wireless exhibition (Oct. 8 to 13) was opened in the Mansion House by Mr. M. R. Hefternan, Parliamentary Secretary to the Free State Minister for Posts and Telegraphs. It was organised by the Irish Radio Traders' Association, and the goods shown were almost exclusively of British manufacture. Mr. Hefternan said their ambition was to bring reception within crystal set range of the greatest possible part of the Free State population. Two possible forms of extension were involved: a number of short-range stations, or a high-power station to serve the whole country. The latter would be the more satisfactory, but they were faced with technical difficulties. He believed that the recent conference in Berlin of the International Union of Radiophony had approved the allocation of a wavelength that would suit the high-power requirements. They hoped soon to lay a scheme before Dail Eireann for the future development of broadcasting in the Free State.

Radio v. Submarine Cable.—The Galway County Council has been informed by the Free State Government that it has decided to restore communication with Innisboffin Island, lying off the Connemara coast, Co. Galway, by means of wireless-telegraphy, which has come to be regarded as the most reliable means of communication between the mainland and the remote island.

JAPAN.—A report on the economic conditions in Japan up to the end of June last, compiled by Messrs G. B. Sanson, C.M.G., and H. A. Macrae, M.A., Commercial Counsellor and Acting Commercial Secretary of the British Embassy, Tokio, contains the following interesting paragraph on "Broadcasting and Radio Apparatus" in the county in question:—

"Radio broadcasting was commenced in Japan about three years ago, but the power of the three original stations at Tokio, Osaka and Nagoya provided only a small 'crystal range,' and the demand was mainly for valve sets, which limited the demand to those who could afford these sets. Now, however, the power of the Tokio and Osaka stations has been raised to 10 kw.; Nagoya is expected to follow suit, and six similar stations are being opened. These developments, it is expected, will greatly increase the use of inexpensive crystal sets. At the commencement dealers in radio apparatus overstocked considerably, and consequently, in 1926, there was a severe slump, and many dealers failed. Now these surplus stocks have been cleared off, but in the interval Japanese firms have taken up the manufacture of apparatus. The import duty upon radio apparatus was originally 20%, but a year or so after it was raised to 40%. This practically eliminates business in made-up articles, which are now turned out in Japan, but there is still some opening for materials required by the Japanese makers, such as good quality magnets, enamelled wire for coils, &c. Such parts as transformers, condensers, &c., and complete sets are practically ruled out. Some opportunity should occur for headphones, which are not made in Japan to any extent. Generally speaking, English headphones are too dear as compared with German. Valves are made in Japan, although some business is still done in American 'tubes.' British makers must remember that the American style base is employed in Japan. Contrary to a very prevalent idea, quality and condition are studied in Japan, and manufacturers must attend to this and cater especially for the needs of the market."

JAVA.—A world's record for long-distance wireless-telephone communication was established on Oct. 4, says *The Times*, by a call between Bandoeng (Java) and Buenos Aires via Kootwyk (Holland) and Nauen (Prussia). Although communication was actually established, the experiment was not entirely successful and the trials will be continued.

Nearly a month later, however, a Reuter message from Sydney (N.S.W.) stated that two-way radio conversations were held on Oct. 31 by wireless telephony over a triangular circuit including Sydney, Java and Schenectady (N.Y.). The audition was said to have proved most successful.

MALAYA.—*Line Shortage relieved by Radio!*—The chief secretary, Mr. W. Peel, in his Budget speech before the Federal Council, forecast the early introduction of carrier telephony. The extent to which it is intended to extend internal communication facilities in Malaya is indicated by an order which has been placed with the Crown Agents for two complete sets of carrier telephone apparatus, one each for Kuala Lumpur and Ipoh, which is the first section which will be operated. On its success, says the *Financial Times*, will depend whether two further sections will be started next year. Being an innovation, the manufacturers, the Standard Telephones & Cables, Ltd., have been requested to send out an engineer to install the apparatus. At present the trunk lines are extremely congested, and the new installation is expected to relieve them.

RUSSIA.—The People's Commissariat for Posts and Telegraphs of the U.S.S.R. has decided, says the *Daily Telegraph*, to build several new short-wave radio stations in Middle Asia, namely, in the Pamirs, Khorog, and Hassan-Kuli.

SEYCHELLES ISLANDS.—*A Wireless Station for Sale! Complete!*—A complete wireless station among the Seychelle Islands, in the Indian Ocean, is for sale. It was built during the war for the Navy, says *The Electrical Review*, but the Admiralty wants it no longer, and the Governor of the Seychelles invites tenders from anybody who wants to buy it.

SOUTH AFRICA.—What is claimed to be the most powerful broadcasting station in the Empire outside Great Britain was opened on Oct. 22 by Mr. W. Madeley, South African Minister of Posts and Telegraphs. The station will serve the Union of Rhodesia, and under favourable conditions can communicate with Britain, says the *Evening News*. It is situated on the highest point of the Witwatersrand at an altitude of about 6,000 ft.

SWEDEN.—Reuter's Trade Service informs us from Stockholm that the number of wireless receiving licences issued in Sweden continues to increase, and the total number issued is now 371,000, or 61 per thousand of the population.

SWITZERLAND.—From Berne, through Reuter's agency, we learn that the Swiss Wireless Company has decided on the construction of a wireless receiving and transmitting station near Geneva, at the cost of a million francs. It is expected that the station will be ready next summer.

TURKEY.—It has been reported that the Radio-Angora station was officially opened on Nov. 1, and is declared to be operating on a wavelength of 1,600 m. with 5 kw. power. It is not known whether a new station is referred to, or whether the existing Angora plant (1,818 m., 20 kw.) has been modified.

U.S.A.—Reuter's Trade Service, New York, reports that a survey prepared for the National Broadcasting Company shows that there are 9,640,348 families operating receiving sets in the United States, with an estimated audience of 41,453,496.

The United States Presidential campaign wound up in a blaze of oratory. Dozens of speakers, both Republican and Democrat, made their last frenzied appeals to the huge electorate.

For the first time in history, millions of prospective voters in isolated country districts were reached by wireless broadcasting, a form of propaganda on which both parties spent vast sums of money. The Democrats in this connexion admit an expenditure of at least £120,000, while the Republicans have probably spent as much if not more.

General and Personal.—Private Companies.—The half-yearly dividend of the Dubilier Condenser Co. (1925), Ltd., has been declared on the 7½% cumulative preference shares.

The directors of W. T. Henley's Telegraph Works Co., Ltd., have declared an interim dividend on the ordinary shares of 1*s.* 6*d.* per share, less tax, to be paid on Dec. 1. The same rate was paid last year.

An interim dividend at the rate of 5% per annum, free of tax, has been declared by the Indo-European Telegraph Co., Ltd.

The report of the Amazon Telegraph Co., Ltd., for the year ended June 30 last records a gross revenue of £56,680 (against £62,114 in 1926-27) and working expenses of £35,968 (£34,221). After providing for debenture interest and sinking fund and income tax, and adding £3,412 brought in, there remains a balance of £940 to be carried forward.

The committee representing the £1 ordinary shareholders in Marconi's Wireless Telegraph Co., Ltd., points out in a circular just issued, says the *Financial News*, that the need for protection through the committee arises from the fact that, while according to the best legal opinions obtainable, the £1 ordinary shares rank for dividends and in a winding-up for a return of capital for twice the amount of the 10*s.* ordinary shares, the board appears to contemplate an exchange of shares on a basis which would be less favourable to the holders of the £1 ordinary shares than would be the case if all the assets of the Marconi Co. were sold for shares in the merger company, and if the latter shares were distributed in a winding-up among the Marconi shareholders according to their legal rights. The committee awaits the publication of the scheme before formulating considered proposals for the protection of the £1 ordinary shareholders.

The Electrical Review states that it was announced later that a similar committee had been formed on behalf of the holders of the 7% cumulative participating preference shares. The committee consists of Sir Richard Davies, C.B.E., Mr. F. P. Robjent, Mr. H. Guedalla, and Mr. A. Kohnstamm, with Mr. Bernard Wicks as secretary.

As regards the Irish shareholders, the *Electrician* states that "the Marconi Irish Shareholders' Association on Oct. 22, passed a resolution that the committee had under consideration a reply from the board, dealing with the division of shares in the proposed merger company, and also a fairly full statement giving clear indications of proposals. Both were deemed very satisfactory, and the committee was of opinion that the 10*s.* shareholders would find that they had been fairly treated when the proposals had been circulated by the merger company."

It is understood that something in the neighbourhood of £300,000 has been mentioned as the price to be paid for the sale to the Eastern Telegraph by the London County Council of certain buildings—formerly the Education Offices—as the future offices for the "merger" company.

Mr. H. M. Pease has relinquished the position of managing director of Standard Telephones & Cables, Ltd., due to the pressure of work occasioned by his position as vice-president and general manager in Europe of the International Standard Electric Corporation. Mr. Frank Gill has been appointed chairman of the board and Mr. E. S. Byng, managing director of the company.

For our Advertisers.—Contracts Open.—Where not otherwise indicated quote reference and apply Department of Overseas Trade, London, S.W.

Postmaster-General's Department, Melbourne, Dec. 11.—Supply of instrument cords. (Schedule C. 374.) (Reference B.X. 4,811.)

Postmaster-General's Department, Melbourne, Dec. 11.—Supply of telephone generators. (Schedule C. 375.) (Reference B.X. 4,812.)

South African Posts and Telegraphs, Dec. 13.—Supply of solder, copper wire, and cable. (Reference B.X. 4,799.)

ANGORA.—Department of Posts, Telegraphs, and Telephones, Dec. 18.—Supply of 50,000 metres of rubber-covered field telephone wire. (D.O.T.)

Postmaster-General's Department, Melbourne, Dec. 18.—Supply of motor generating sets. (Schedule C. 377.) (Reference B.X. 4,810.)

Postmaster-General's Department, Melbourne, Dec. 18.—Supply of lamps, lamp caps and lamp sockets. (Schedule C. 378.) (Reference B.X. 4,819.)

New Zealand Government Railways, Dec. 20.—Sub-station equipment, including switchgear, transformers and cables, for Frankton Junction power and signalling supply. (Specification No. 101.) (Reference B.X. 4,771.)

South African Department of Posts and Telegraphs, Dec. 20.—Supply of telegraph materials, including 30,600 tubular arms (4, 8 and 12-wire), 50,000 galvanised clipstalks; 180,000 insulators, 600,000 nails; 24 ft. iron poles (to specification 57A and drawing No. 609); 2,000 upper tubes, 2,000 bases, 2,000 screw rings and 2,000 lightning rods for same; parallel poles for farmer's lines (to specification No. 1,240 and drawing C.E. 134A); 5,000 upper tubes, 50,000 bases, and 50,000 wedges for same; 30,000 suspension rings, 80,000 spindles; 2,500 rolls of tape and 12,000 lb. of stranded steel wire. (Tender No. 134.) Schedule, specifications, &c., can be seen at the Department of Overseas Trade.

New Zealand Posts and Telegraphs, Jan. 15.—Supply of telephone cords (tender No. P. and T. 151/1,084). (Reference B.X. 4,847.)

New Zealand Public Works Department, Feb. 12.—Supply of 110 kv. switchgear and controlling equipment, for Waitaki power scheme, section 3. (Reference B.X. 4,848.)

Promotions.—Mr. J. G. King, Superintendent Cable Room, C.T.O., to be Superintendent Higher Grade. This is a provisional appointment, and thus one is taking a certain risk in *these* days in heartily congratulating the recipient.

To Mr. A. T. Simmons, also of the Cable Room, C.T.O., whose Provisional Overseership has been made a substantive appointment, one need have no qualms in letting one's self go.

GOVERNMENT AIDS TO INDUSTRY.—There is a great need of better and fuller statistics of production of capacity and unfilled orders than we have at present. What was wanted, if it was to be of practical value to industrialists, was live and up-to-date information, which would help them in forecasting the future trend of business. Although it was conceivable that industries could organise this service for themselves without Government aid, there was little doubt that it would be organised more quickly and completely if industry had the backing of a Government Department, which would plan the main lines of the work and could have some power of coercing a recalcitrant minority. Here, a Government Department had the great advantage of being disinterested and impartial, and able to keep a secret, and in a matter of this sort these things counted for a great deal.—*Sir Henry Bunbury.* J. J. T.

REVIEWS.

"*Introduction to Theoretical Physics.*" *By Arthur Haas, Ph.D. Vol. I. Second Edition revised. (Published by Constable & Co., Ltd. xiv + 333 pp. Price 21s. net.)*

Last year we had the pleasure of reviewing a book by Dr. Haas on Atomic Theory. This was an extract from the second volume of Dr. Haas' large work on Theoretical Physics.

A second edition of the full work is being issued, and the first volume of this new edition is now available. The subject is treated with the same clearness of exposition which we noted in the smaller book. The notation used is consistent throughout, a great comfort to the reader, who is saved the annoyance of having continually to check the meaning of the symbols which he meets.

The mathematical discussions are extremely clear, and full demonstrations are given. The expression "It is evident that," that bugbear of students, is conspicuous by its absence.

The book is divided into two parts, Part I dealing with Mechanics, and Part II with Electromagnetic Theory.

Part I comprises chapters on the motion of a Free Particle, the General Principles of Mechanics, the Motion of Rigid Bodies, the General Theory of Vector Fields, the General Theory of Vibrations and Waves, the Motion of Deformable Bodies, and the Theory of Potential.

The second part treats of the Fundamental Laws of Electricity and Magnetism, Maxwell's Theory of the Electro-magnetic Field, and the Theory of Optics.

The need for a thorough grounding in physics is felt nowadays by students in nearly every branch of science, and in our opinion Dr. Haas' book is one of the very best which we have met for enabling the student to acquire this knowledge with the minimum of misdirected effort. He is led on logically, step by step, so that he finally obtains a view of the whole subject in which the various component parts fall naturally into their places to form a consistent whole, and which is immediately available for any further use to which he may need to apply it in the course of his work.

"*Probability and its Engineering Uses.*" *By Thornton C. Fry, Ph.D., member of the Technical Staff, Bell Telephone Laboratories. (Published by Macmillan & Co. xiv + 476 pp. Price 30s. net.)*

In the early days of engineering questions involving chance and probability had seldom or never to be considered. A bridge had to be built or a dam constructed, and the maximum conditions which had to be met were all more or less accurately known. To allow for possible defects in the material, or underestimates of the stresses to be withstood, a factor of safety was introduced, and after that everything was quite straightforward and definite.

The modern developments of transport and communication engineering, however, have introduced quite a different type of problem. It is now necessary for the engineer to estimate, say, the probability that the number of junction lines provided for an automatic exchange will be sufficient to deal with the traffic during the busiest period of the day with not more than a definitely allowed proportion of lost calls. Many similar problems arise in which the balance has to be held even between extravagance in the provision of plant and non-permissible loss of service.

The book under review, which is an expansion of notes for a course of lectures to the staff of the Bell Telephone Laboratories, deals with that particular portion of mathematics which treats of the theory of probability, from the definite viewpoint of its application to the solution of engineering problems.

After an introductory chapter dealing with fundamental definitions and axioms there follow a chapter on permutations and combinations and one on elementary principles of the theory of probability.

The next two chapters treat of the investigation of questions of probability by means of experiments.

The sixth chapter deals with distribution functions and continuous variables. In the seventh the various types of averages met with in statistical work and the deviations of numbers from the average of the set are discussed.

The next chapter deals with the distribution functions most frequently used in engineering, and discusses their application to such problems as those which arise in connexion with the traffic at a telephone exchange. The following chapter deals with the methods of inferring distribution functions from observational data.

In the tenth chapter, which is one of the most interesting in the book, the previous work is applied to the various problems of congestion which arise in such practical fields as the working of a telephone system.

The final chapter deals with the application of the theory of probability to a number of important questions in physics.

In an appendix are given a collection of useful tables for facilitating the working out of numerical problems.

The book is one which will be found very useful for those who are engaged in work in which probability problems are met, and who are desirous of obtaining the knowledge necessary to deal with such problems without having to study a wide range of literature for the purpose.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Sept. 30, 1928, was 1,687,275, representing an increase of 9,319 on the total at the end of the previous month.

The number of stations working at Sept. 30 in London, England and Wales (excluding London), Scotland and Northern Ireland was as follows :—

	No. of Stations at Sept. 30, 1928.
London	599,003
England and Wales (excluding London) ...	914,696
Scotland	152,574
Northern Ireland	21,002

The growth for the month is summarised below :—

Telephone Stations—	*London.*	*Provinces.*
Total at Sept. 30	599,003	1,088,272
Net increase for month	3,661	5,658
Residence Rate Subscribers—		
Total	140,189	222,734
Net increase	1,407	1,831
Call Office Stations (including Kiosks)—		
Total	5,429	19,661
Net increase	29	136
Kiosks—		
Total	1,119	4,499
Net increase	38	107
Rural Party Line Stations—		
Total	—	10,363
Net increase	—	49
Rural Railway Stations connected with Exchange System—		
Total	—	984
Net increase	—	9

The total number of inland trunk calls dealt with during July, 1928 (the latest statistics available) was 9,502,807, an increase of 707,645, or 8% on the figure for the corresponding month last year.

Outgoing international calls in July numbered 35,743 and incoming international calls 38,506, representing increases of 10,695 (42.7%) and 11,850 (44.5%) respectively over July, 1927.

Further progress was made during the month of October with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Chigwell, Rainham.

PROVINCES—Colne, Horsham.

And among the more important exchanges extended were :—

LONDON—Brixton, Maryland, Willesden.

PROVINCES—Barnt Green, Boston, Didsbury, Hoylake, Knock, Mansfield, Potters Bar, Solihull, Walton-on-Thames.

Seventy-five new overhead trunk circuits were completed, and 79 additional circuits were provided by means of spare wires in underground cables.

THE G.P.O. PLAYERS DRAMATIC SOCIETY IN "OUTWARD BOUND."

TRUE to its tradition of offering to its supporters only works of intrinsic merit and interest, the G.P.O. Players presented on Nov. 9 and 10 last Sutton Vane's much-talked-of play, "Outward Bound." This ingenious allegory in which seven or eight mortals find themselves bound for eternity on board a mysterious vessel, without officers and without crew, contains some thrilling moments—notably when perception dawns on the passengers that they are no longer in the land of the living and are, moreover, in disquieting doubt as to their destination. Allegories are ticklish weapons to handle, but Mr. Sutton Vane keeps his instrument sharp and bright throughout. With it he endeavours to pierce the mystery of the after life, and the result is both moving and impressive. The ultimate meeting of the departed souls with the Examiner loses some of its terrors when it is found that he is considerate and understanding and is prepared to give them a fresh start on the Other Side. That was a happy and surprising touch by which the two lovers find themselves called back to earth, and furnished a dramatic conclusion to the piece.

The general level of the acting was so good, that it is difficult to single out for praise any of the individual artists. The performance was sure of touch and finished throughout. Mr. Cyril Leigh as Scrubby, Miss Emery as Ann, Mr. Jack Scott as Henry, Mr. Sellars as the Examiner, Mr. Cahill as a hustling representative of Big Business in Parliament, were all excellent. Laurence Gartland as Mr. Prior, Gerald Storr as the Rev. William Duke looked and acted their parts to the life, and Miss Beatrice Cowan as Mrs. Cliveden Banks was a perpetual joy. If we may single out any character for special commendation, we would mention Miss Isabel Hood, who raised her comedy part at the dramatic moment to the tragic plane, but some most moving and sincere acting. The play was produced by Mr. Julien Mitchell, and in his absence, the call for the producer at the close of the play was responded to by Mr. Hatswell, who made a happy reference to the assemblage on the stage in the words *De mortuis nil nisi bonum*, and, indeed, nothing but good could be said of those "Dead."

W. H. G.

POST OFFICE SANATORIUM SOCIETY.

THE Post Office Sanatorium Society, by its methods and successes, has been referred to very frequently by well-known experts on consumption as being the most significant and useful object lesson ever given by the working-classes. That such a result should have been obtained, and that such an impression should have been created within 21 years of the commencement of its official operation, is a great tribute to the value of the society. The society itself stands as a unique example of what working men and women can do by self-help and co-operation at minimum cost with maximum results. In its capacity as exemplar it has given a tremendous impetus in stimulating interest and encouraging practical application. Indeed, it may be said with perfect fairness that the Post Office Society has exerted considerable influence on the public movement in Great Britain towards combating and stamping out what has been truly termed "the white scourge." Prevention and treatment of consumption are both a public and a personal duty, and of these prevention is undeniably the most important. It is a melancholy reflection that few homes have escaped consumption's ravages ; few families exist in which the loss of a dearly-loved parent or child does not testify to its deadly nature. The society exists for the purpose of alleviating anxiety and relieving distress, and so adds materially to the well-being and happiness of Post Office employees. Incidentally it contributes towards the progress of the national movement against the country's most deadly disease, and consequently it is worthy of practical consideration.

READING INDUSTRIES EXHIBITION TELEPHONE STAND.

ALTHOUGH the telephone service, in this country at any rate, is conducted as a public service, there is a distinctly commercial side to it; therefore the holding of a telephone stand at an industrial exhibition should not be very surprising. As a purely local Departmental effort, however, it is believed that telephone exhibit at the Reading Industries Exhibition during the week ending Oct. 6 was unique, and, for that reason, some impressions gathered during the time might prove of interest.

Briefly, the stall displayed an automatic telephone exchange working on three digits with four lines connected. In addition, apparatus in more common use locally was shown together with sections of underground cables. A large supply of advertising literature was, of course, available.

It can be said at once that the exhibit was a success when judged by the standard of interest taken in it by the public. A reason for this display of interest is easy to find: the industries of a small town are generally familiar to most of its inhabitants, and only the most elaborate window dressing can hold a Readingsian's attention to biscuits, for example! It is true that the telephone is a common enough object, but the uncanny intelligence of automatic selectors is ordinarily withheld from the public eye—it is the unfamiliar and unusual which excites the jaded public taste. Again, we had something in motion—a thing that is quite irresistible to a man who was once a boy!

To turn to the purely business aspect, it is too early yet to judge direct results, but it may be stated that orders taken during the week put the effort on a paying basis. In addition to ten orders taken, requests for four estimates for private automatic branch exchanges were made—a large number for a town of this size when it is considered that seven establishments are already equipped. The public call office installed (which, by the way, was accepted by the Exhibition organisers in lieu of payment of rent for the stand) collected between three and four pounds during the week.

With regard to the after effects of our efforts, as has been said, it is too early to give any details, but some thousands of leaflets and cards were judiciously distributed, and it is inconceivable that these can have no result when combined with the general advertising effect.

Leaving the measurable profit side of the Exhibition, the writer—who was in attendance the whole time—is convinced that the psychological effect was excellent, and must be eventually reflected in actual business. One could not but gather the impression that many left our demonstrations and explanations viewing the possibilities of the telephone in the home and office from a different angle—seeing it as a possible, not very expensive, addition, not as some luxury of the rich, conducted by some far-away abstract administration which existed as a target for newspaper abuse. We tried, and I think partially succeeded, to make them see it as a thing people were "going in for," like electric light. More or less the same thing was shown in conversations with heads of the more important business firms. They came to chat with us more as associates, keen and willing to do business as they were. Possibly they knew that before, but in many cases the thought was largely subconscious. Practically expressed, they would agree to rent additional telephone facilities, not as a kind of necessary evil, but rather as purchasing "good goods"—regarding the transactions as good bargains more than as a tax. A thoughtful person must, in a very generous moment, have some sympathy with income tax officers, and the writer, who has had some experience with the public, has often felt that some measure of this sympathy could justly be given to the telephone accounts department!

Another point: permitting subscribers, potential and actual, to have a peep behind the scenes of telephone working is almost certain to have a good effect. Readers of the *Journal* will remember a letter from Mr. F. T. Hood, in the May issue, on this subject—it would be hard to disagree with his observations.

In conclusion, to the possible question, "Are such displays worth while?" the answer can only be "Yes." It has been amply demonstrated that in not too magnificent an exhibition an effective telephone display can be made with little apparatus and expense. The Reading effort shows that immediate profit can be looked for, though the writer considers this of less importance than the psychological effects. We admit, as indeed we must, the commercial side of telephone service; we advertise and expand the Contract Branch which is exclusively occupied with this side. Surely it would then be unwise, to say the least, to neglect any economical scheme to accelerate the growth of the service.

F. J. LANE, *Contract Officer.*

PRESENTATION TO MR. F. T. WADLEY.

ONE of the happiest and most enjoyable gatherings at which the writer has been favoured to be present was certainly the Bohemian Concert of the Fortels Sports Club (Cable Room, C.T.O.), held on the 6th of last month at the First Avenue Hotel, Holborn, when this function was made the occasion to present Mr. Wadley, late Assistant Controller of the Foreign Cables, &c., with a gold watch as a token of the high esteem in which both staff and supervision have held him throughout the whole period of his control of this important branch of the British telegraph service, and to wish both their late chief and his esteemed wife, Mrs. Wadley (*née* Edith Agnes Hood) a long and happy retirement.

A particularly choice souvenir was also presented to the latter in the shape of a jewelled pendant.

Mr. J. G. King, Senior Superintendent, made the presentations in a speech which ably expressed the united feelings of affection with which all present and the many detained on duty parted from their head.

Mr. Wadley replied on behalf of himself and Mrs. Wadley with a sustained composure which, however, could not entirely hide that "something too deep for words," and the musical honours which followed afforded a welcome opportunity to many of us to give vent to our feelings.

Commander Grattan, who has succeeded Mr. Wadley as Assistant Controller, followed with a few appropriate remarks and presented the special "pots" to the heroes of the last season.

The musical programme, an excellent one under the direction of Mr. John Fox, was then continued, the interval having been specially set apart for the presentation by the courtesy of the Fortels Committee.

To name the artistes will be sufficient to indicate the front line quality of the musical and elocutionary talent provided, viz., by Miss Marjorie Holton and Miss Sybil Maden, by Messrs. Claude Pilgrim, Merlin Vaughan, Arthur Brough, Bert Sainsbury, Ernest Elliott and Harry Hearne, not forgetting Mr. Lionel Stanton, the accompanist, or the piano soloist, Mr. Lewis Dinsmore.

Earlier in the same day the Controller's Office was the scene of further marks of esteem, a handsome travelling clock and a lady's bag being handed appropriately to the happy pair.

T.

TELEGRAPHIC MATTERS.

BY H. P. STEED.

AT a recent meeting of the P.O. Telephone and Telegraph Society, at which attention was drawn to the great variety of different telegraph systems in use, it was intimated that a serious attempt will be made to reduce these to three, namely, sounder, teleprinter, and multiplex.

Apparently the sounder would be retained for working to offices which have insufficient load to warrant the expense of providing teleprinters. This policy seems to be undesirable in view of the need of uniformity, not only from an operating point of view, but for engineering reasons. It is a matter for consideration whether very lightly loaded offices might not be more suitably catered for by means of the telephone, and that teleprinters be installed at other offices to a much greater extent than is immediately contemplated.

Apparently the retention of the multiplex distributor is inevitable, despite the attractions of voice-frequency proposals.

For not altogether appreciating the efforts of inventors, the writer has been called a "Troglodite." Inventors are, however, generally harmless, provided their ideas are focussed in the right direction. I suggest, therefore, that telegraph inventors should now attempt to supersede the present multiplex automatic transmitters by means of teleprinters adapted for multiplex working.

Possibly the first thing to do would be to replace the five segments on a distributor, required for one arm, by means of a long single segment occupying the same space as the five.

The cadence signal would still be needed; but rhythmic type-writing movements should present no great difficulty. The synchronism of teleprinters, as such, would be independent of the distributors and the long segments on the distributors should permit of a wider margin of variation of speed without interference with the working of the teleprinters. The rate of rotation of the brushes could be adjusted to suit operating speeds, and might even be slow enough to enable the older telegraphists to perform teleprinter operating sufficiently satisfactorily.

Maintaining Strowger Automatic Supremacy—

Through Exacting Inspection Methods.

The view below shows a final inspection line for selector switches, where experts in every phase of operation of the selector switch check each one for proper assembly and adjustment, and for correct performance under all conditions.

EVERY step in the manufacture of Strowger Automatic telephone equipment, from the raw material to the finished product, is subjected to the constant supervision of experts and every unit must pass successive inspections designed to reveal the slightest flaw in material, construction or operation. The final inspection line for selector switches here illustrated is the last step in a long series of tests which definitely insure every part going to make up each individual switch to be virtually perfect from every standpoint.

The high reputation for performance, dependability and long life which Strowger Automatic equipment enjoys to-day is the result of the thorough system of inspection which has been maintained by Automatic Electric Inc. from its earliest days, and the exact control of quality which has been insisted upon at every step in manufacture. That Strowger Automatic equipment has always been in advance of the telephone art is due largely to that spirit of insistence which demands the best in every phase of its development, its production, and its installation.

This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.

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STROWGER AUTOMATIC

The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

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THE MARVELLOUS AND THE FAMILIAR.

THE proverb "Familiarity breeds contempt" is perhaps only a homely expression of the truth that when we have become accustomed to the marvellous, when we have long or close knowledge of the truly great, whether in the world of men or of ideas, they lose their power to excite admiration. We take them for granted, and cease to wonder at them, and, indeed, in the case of the achievements of the human mind, we are apt to forget the stupendous efforts (and the gradual steps) required to bring them to the present familiar perfection. We may instance the electric telegraph. It is only ninety years ago since our telegraph system consisted of a short line from Euston to Camden and another from Paddington to West Drayton. Yet to-day the average man who walks into a telegraph office and hands in a telegram for Dar-es-Salaam, or Delhi, or Demerara, never doubts that it will be delivered there as a matter of course. He does not envisage the difficulties encountered in the laying of the first transatlantic cable, or pause to think of the magnitude of the task of constructing an overland line through Russia, across the Caucasus and over Persian deserts to India. He may, indeed, realise that all great enterprises required troublesome pioneer work, and is content to leave it at that. Hence it is, perhaps, that the too familiar telegraph excites at the present time less interest than the telephone. It is true that the public have long ceased to wonder that they can pick up a receiver and listen with ease to a correspondent in Edinburgh or Exeter. That, too, is now taken as a matter of course. But they are not yet thoroughly familiarised with the idea of speaking over a large part of the world. It is not long since that overseas communication was confined to a few places in France and Belgium. But the thermionic valve and the radio telephone have changed all that. Subscribers can now speak to the principal places in both North America and the greater part of Central, Western, and Northern Europe. The average telephone subscriber, however, is only beginning to realise this. The fact that he can hear Berlin as clearly as Brixton is still a theme for wonder. He does not yet take it as matter of course that he should be able to ring up any town on the habitable globe. He knows that the area of communication is still circumscribed and each addition to it is a piece of news and a matter of interest. To-day Milan and Genoa may be added to the list, tomorrow it may be Warsaw or Helsingfors, and time will doubtless bring Belgrade, Bucharest, and Constantinople within the circle. Perhaps at some future day, when wireless telephony has surmounted all obstacles, and subscribers in London can ring up friends connected with exchange telephone systems at the Antipodes, an air of universality or everyday-ness will invest the long-distance telephone, and men will cease to wonder at the phenomenon of speaking over thousands of miles without even the aid of wires except on the local systems. We may be inclined to cry: *Sic transit gloria mundi*, but happily if the wonder departs the usefulness remains. The true glory was the inventors' and the pioneers'; it is to their greater glory if their invention becomes one of the indispensable commonplaces of civilisation.

MOTOR CARS AND TELEPHONES.

THE motor industry and the telephone industry have little in common. Nevertheless we always peruse with interest the annual sent to us by the Motor Industry of Great Britain, because there happens to be a fairly close relation between the number of telephones and the number of motor vehicles existing in some of the more progressive countries. In this country, for example, there were in 1927 1,204,075 motor vehicles (excluding cycles) to 1,633,802 telephones; in the United States 23,253,882 motors to 18,523,000 telephones, in France 976,646 motors to 883,406 telephones, in Canada 932,540 motors to 1,265,869 telephones, and in Australia 448,101 to 461,715. In Germany, however, there is no comparison between the respective figures, there being 2,814,996 telephones to 384,709 motor vehicles. As might be expected, in Scandinavia also the telephonic development is well ahead, Sweden having 466.7 thousand telephones to 109.5 thousand motor vehicles, and Denmark 319.5 thousand to 87.7 thousand.

Except in the United States and France, it will be noticed that the development of telephones is well in front of that of motor vehicles.

HIC ET UBIQUE.

THE total number of telephones in Canada is reported as 1,265,869 at Dec. 31, 1927, a gain of 61,117 over a year ago. The average of the Dominion is 13.19 per 100 of population against 12.73 at the end of the previous year.

Ontario has 561,043 telephones in service, which is more than 17 per 100 of population. British Columbia, with one-sixth of Ontario's population, has 108,556 telephones, which is almost one to every five persons. Quebec's percentage of telephones is one to 10 and the Maritime Provinces still lower. The Yukon, with 200 telephones, has a percentage of 5.76.

On Nov. 2 a second "through" Anglo-Swedish telephone circuit was opened between London and Malmö. It will be used chiefly to carry the traffic to Norway and to the southern and western parts of Sweden.

"Lubo" wrote recently to the *Evening Standard* :—

> "Sir,—Many taxpayers will doubtless rejoice to have read in the *Evening Standard* the ingenuous admission of a Post Office official that the phenomenal increase in the transatlantic traffic is "due in a great measure" to the reduction (by 40%, it should be noted) of the original tariff charges.
>
> "One is encouraged thereby to hope that this remarkable revelation of the operation of economic laws may possibly receive the attention of other branches of this great public department."

The "ingenuous admission" and "remarkable revelation" are priceless as an effort at sarcasm. "Lubo" seems to infer that because a £15 transatlantic call can be reduced to £9, a 40% reduction of the charges for other services would be justified. We can assure him that the operation of economic laws which would result from selling ordinary telegrams and telephone messages below cost price would *not* rejoice the taxpayer in the least. On the contrary!

According to the *Daily Telegraph*, "the installation of an automatic system at one of the big Paris exchanges, although it has been generally hailed as a welcome move in the direction of modernising the French telephone service, has not satisfied everyone concerned, and certain subscribers to the exchange in question are demanding the restoration of their old-fashioned instruments and of human telephone operators.

One point of complaint is that subscribers should not be required to manipulate a system which they do not properly understand, for many of them, it seems, through lack of skill have only been able to get connexion with a series of wrong numbers.

Another point is that certain subscribers have relied on telephone girls for certain personal services, such, for instance, as being called by telephone at a certain hour in the morning or being told the correct time when they asked for it. One such subscriber is so dissatisfied that he says he will leave his flat for one which is connected with a manual exchange. This gentleman added that he would always insist also upon service of female operators, for he found the clicking of a mechanical apparatus far less agreeable than the sound of a woman's voice."

It is difficult to discriminate nicely between the proportions of conservatism, sentiment and susceptibility (in the gallant sense) which make up this lament!

An enquirer in the *Jewish Chronicle* having raised the question whether it is lawful to use the telephone on the Sabbath day, a correspondent writes :—

> I. H. H. may be interested to know that a similar question was raised 206 years ago.
>
> In his *Responsa*, printed 1722, par. 31, Rabbi Jacob Reischer, of Prague, addresses the following question to his brother-in-law, Rabbi David Oppenheim :
>
> ". . . . and particularly with regard to the special instruments whereby one is able to speak and listen to his friend at a distance of many many *miles ; should such a thing be forbidden on the Sabbath Day ?* We have never heard anybody query this matter!"
>
> Considering that the telephone dates back to about fifty or sixty years only, the above is a most remarkable pronouncement. What sort of a telephone was it that the Rabbi mentions, and where and in what Jewish Community did it exist?

This sounds remarkably intriguing. In the following week's issue of the *Chronicle*, however, another correspondent seeks to dispel the vision of an early eighteenth century telephone by a quotation from another *Responsa* which he translates : "there must have been an apparatus (probably a tube) the use of which incurred no breach of the Sabbath."

But by what tube could one speak to a friend "at a distance of many, many miles"? We do not consider the mystery solved, and we should be glad to learn what sort of forerunner of the telephone could have existed or what mysterious black art was practised at Prague in 1722 which would enable one to do so.

This is a true story, though we confess to having not only omitted the name of its subject, but altered his Department and the local details in order to conceal his identity. Mr.——, of the London Postal Service, situated in King Edward's Building, has never succeeded in accustoming himself to the use of the telephone. He is heard indistinctly because he speaks too loud ; and finding himself inaudible speaks louder still. A visitor to the building, hearing a frightful noise from within his room, enquired the cause, and was answered, "Oh. that's Mr. —— talking to Mount Pleasant." To which the visitor retorted, "Well, why the deuce doesn't he use the telephone?"

During the past month the transatlantic telephone service has been extended to Vienna, Budapest, Prague and to all parts of Spain.

It is reported in the Press that direct wireless telephonic communication between Holland and the Netherlands Indies will be available for the general public daily in January. The tariff, it is said, has been provisionally fixed at 50s. for a three minutes ordinary call, £5 for an "urgent" call, and £10 for a "lightning" call. These latter categories of call are, of course, not admitted in the British Overseas Services.

The Times reports that a wireless telephone service between Germany and the Argentine is expected to be ready for public use early in the current month. Landlines will, of course, be employed between the German towns and the wireless station at Nauen and from thence the communication will be maintained by the short-wave system.

CHANGES AT THE CENTRAL TELEGRAPH OFFICE DURING THE LAST FIFTEEN YEARS.*

BY MR. J. STUART JONES, CONTROLLER, CENTRAL TELEGRAPH OFFICE.

EXACTLY 15 years ago this month Mr. John Newlands, then Controller of the Central Telegraph Office, gave an address to this Society on the methods and results of the Telegraph Service, and, when the call came to me to read a paper to you, it seemed to me that it might interest you, or some of you, if I attempted to describe the changes which have occurred in the Central Telegraph Office in the intervening 15 years, especially as these changes are, in many cases, representative of what has happened in the other large offices of the British Telegraph Service. I do not place the possible attractions of such a paper at a higher level than that of interest because I am doubtful whether retrospects in the Telegraph Service, as in private life or in other fields, are fruitful of much good in the way of instruction for future guidance. The problems of to-day are never the same as those of yesterday, and the interest of a survey of past years lies mainly in discovering the places where we seem to have gone wrong and the places where we seem to have kept the right road.

Mr. Newlands, in his address, not only described the methods of operation and the results obtained in the Telegraph Service at that time, but gave a short review of the development of the Service since it became a State monopoly in 1870. To those telegraph men and women with an historical bent I commend a re-reading of Mr. Newlands' address. It is full of interesting matter and suggestions prepared with the thoroughness of detail and urged with the force which characterized Mr. Newlands in 1913, and, I am glad to think, still characterize him.

The changes in the apparatus employed and in the routine practices of the Inland Telegraph Service in the 43 years between 1870 and 1913 were very considerable. The various types of apparatus which had been in use in the early days, such as the single and double needles, the double-plate sounder, the A.B.C. and others, had given way to a standard method of operation by morse sounder, except in the case of news wires which were operated by Wheatstone automatic apparatus. Here and there in 1913 an A.B.C., and even a double-plate sounder, might still be found, but except for eight routes which were worked on the so-called "continuous" Wheatstone system, for a solitary Baudot between London and Birmingham, for three routes worked by Hughes apparatus and for two Murray installations, one automatic and one multiplex, and the news wires, the morse sounder held the field. The Inland Telegraph Service was essentially a hand-operated system.

The pre-eminence of Morse during these years was not unassailed. On the contrary, the period was fruitful of telegraphic invention, and while many of the systems tried failed to withstand the test of commercial operation, there emerged two clear and distinct lines of promising development, the use of a five-unit alphabet with multiplex transmission and the application of typewriter keyboards to telegraph purposes.

While, therefore, the 40 years prior to 1913 saw a very real advance towards the standardisation of Morse sounder and Wheatstone apparatus, there were signs towards the end of that period that their position was not impregnable. Donald Murray had abandoned his automatic system in favour of multiplex, Baudot multiplex was attracting attention in this country, while Creed, with Kotyra, Gell, and others accepting the Morse alphabet as a basis, sought to modernise telegraphic methods by means of typekeyboard perforation and automatic printers.

At the C.T.O. the Murray automatic, which was a high-speed five-unit system, had been tried successively to Edinburgh, Dublin and Leeds before being abandoned. Later a four-channel multiplex, also devised by Donald Murray, was tried between London and Manchester and proved to be the pioneer of automatic multiplex now becoming standardised in this and other countries. The Baudot multiplex, that ingenious system invented by a French telegraphist and perfected for commercial use as far back as in 1877, did not, strange to say, get a trial in the British Inland Service until 1910, although it had been in use on circuits to the Continent for at least 12 years previously. It suffered perhaps from the fact that in its original form it was arranged for simplex working only, but in 1905 Lt.-Col. Booth devised a method of duplexing the system, an improvement which made its claims for consideration irresistible. Accordingly, in 1910 a quadruple and later a sextuple duplex circuit was installed between London and Birmingham. Mr. Newlands was immediately converted to multiplex, and in his paper he made a strong recommendation for the extension of Baudot working in the Inland Service, stating that it would revolutionize the Service.

At the same time the evolution of Wheatstone working had led to the provision of typekeyboard perforation by means of Gells and the reproduction and printed translation of received signals by means of Creed apparatus.

The Morse alphabet was making a fight to justify its position, and it became evident that the British telegraph administration would have to make a momentous choice so that a settled policy of development could be followed. In 1914 a committee was appointed under the chairmanship of the Assistant Postmaster-General, at that time, Captain Cecil Norton, to "enquire into systems of high-speed telegraphy and to report thereon."

They took great pains over their inquiries, and their report, which was not published until 1917, was definitely in favour of five-unit multiplex, as against the Wheatstone automatic system.

Having determined the policy to be followed, the exigencies of the war produced the opportunity for rapid development. Baudot multiplex circuits were rapidly installed on the routes from the C.T.O. to Birmingham, Leeds, Glasgow and Liverpool, and were followed by others during the war until 14 of the main routes had been equipped.

Excellent though the Baudot system may be, in some respects it suffers from the fact that it was invented in what may be called the pre-typewriter period. Its five-tapper key is an anachronism in a modern telegraph service rapidly developing typekeyboard transmission, inasmuch as it demands manipulative skill which cannot be employed on any other machine and it limits operating speed to 30 words a minute, which involves the loss of valuable line time. To eliminate these weaknesses Donald Murray conceived the idea of keyboard perforation of tape which would pass through a transmitter at a higher rate of speed. He also devised a five-unit code, better suited for typekeyboard use, which is now extensively employed.

Although his original double-duplex installation on the C.T.O.-Manchester route did not survive, it and his later improvements of his system showed the advantages of typekeyboard perforation over the direct-sending system of the original Baudot. The Americans were quicker than we were to realise the advantages of Mr. Murray's system and the Western Electric Company produced a typekeyboard page-printing system, fundamentally based on Mr. Murray's. Equipment of this type was installed on the C.T.O.-Manchester route in 1916. Its rate of working is 40 words a minute per channel and it is still in successful operation. It may be remarked here that the American telegraph companies, having recognised the advantage of typekeyboard operation, never introduced the Baudot in its original form. Improvements have been made in the perforators and in the printers, and at the present time multiplex apparatus is in general use in America, working with extraordinary stability at rates varying from 45 to 60 words a minute.

Unfortunately, we in this country had not the clear vision of the Americans in the matter of typekeyboard operation for multiplex circuits, but during the last few years substantial progress in this direction has been made. Lt.-Col. Booth and Mr. Willmot, of the Stores Department, designed a typekeyboard perforator suitable for Baudot installations, and several installations have been equipped with these keyboards. At the present time 37 of the main telegraph routes radiating from the C.T.O. are operated on the multiplex system, and of these 11 circuits are equipped with keyboard perforators and automatic transmitters. There are in addition two Western Electric installations, the second Western Electric installation being made on the C.T.O.-Manchester route in 1919.

A further development of recent years has been the production of the so-called Start-stop printing telegraph machine, which we have decided to call the teleprinter. It, like the multiplex, uses a 5-unit code. It provides the advantages and speed of typekeyboard signalling and type printing, and its use is being rapidly extended on circuits hitherto equipped with morse quadruplex and duplex apparatus. In the C.T.O., 30 circuits are now equipped with teleprinters, 23 being operated by Morkrum, 2 by Kleinschmidt and 5 by Creed machines.

In the general result, the traffic of the C.T.O. is at present handled to the extent of 40% by multiplex, 40% by Morse sounder, 9% by telephone, 7% by teleprinter and 4% by Wheatstone and other instruments.

The effect of the introduction of printing telegraph machinery on the manipulative operator output of the C.T.O. has been considerable. In his paper Mr. Newlands gave the manipulative output at that time, over the period from 8 a.m. to 8 p.m. daily, as 21 or 22 telegrams per hour. At the present time it is 27. These figures are not strictly comparable, because the earlier figures include the phonogram traffic, with its comparatively low output, and the later figures do not, but a correct comparison would show an increase in the output of about 20%. I believe the improvement is regarded in some quarters as disappointing, but it has to be remembered that there is still much morse operation and also that the benefits of the improved machinery accrue mainly during the peak hours of pressure and cannot be fully realised during the less busy hours when traffic is low.

Prophecy is often in after years a disconcerting thing to the prophet, and I will not attempt to forecast future development beyond saying that, in my opinion, typekeyboard perforation will rapidly supersede the direct-sending of the Baudot, that there will be a considerable extension of teleprinter operation at the expense of morse and that page-printing on multiplex and teleprinter will disappear.

Printing telegraph machines have, of course, brought their own difficulties. It is not easy to determine the types best suited to our requirements, but we have erred, I think, in not making up our minds quickly enough as to the machines which we intend to adopt as our standard apparatus. Different types of apparatus with different methods of operating and different requirements in the matter of maintenance put a strain on a telegraph office, and every effort should be made towards securing as great a measure of standardisation as possible.

* Paper read before the Post Office Telephone and Telegraph Society of London on Nov. 19, 1928.

Another source of much difficulty is the instability of the apparatus. This instability is certainly not inherent in printing telegraph machinery. In America multiplex and teleprinter services are as stable as morse services, and either our machines are not sufficiently well designed or constructed or our methods of maintenance are imperfect. Whatever may be the cause, it is imperative that the remedy should be sought as a matter of urgency, for stability is the most pressing need of the Service at the present time.

Fifteen years ago, according to Mr. Newlands, the average day's work of the Central Telegraph Office ranged from 220,000 to 250,000 transactions. At present it is about 200,000 transactions, a reduction of from 10 to 20% according to which basic figures are taken. In 1913, however, the Cable Room dealt with 25,000 telegrams daily; it now deals with 35,000. In the 15 years, therefore, the Inland traffic has fallen from, say, 200,000 transactions or a little over that number, to 165,000, a reduction of about 20%.

Since the war the establishment of private wire systems by the Press Association and the Central News has taken much news traffic from the Central Telegraph Office. This is illustrated by the fact that in 1913, the staff of the News and Special Sections numbered 356 men and at the present time numbers 210. The sections, moreover, now include certain lines which they did not have in 1913, and the actual comparable number is about 200.

Substantially, the arrangements for the distribution of news traffic have not altered in the past 15 years, apart from a reduction in the number of news wires due to the fall of traffic.

In these 15 years telegraph traffic has passed through some vicissitudes. During the war, after the first months of great pressure, the traffic fell to a point much below the pre-war level. Immediately after the war, a trade boom, which unfortunately proved to be short-lived, raised telegraph traffic to an unprecedented level. Since 1920 there has been a gradual decrease of inland telegraph traffic and, unfortunately, there is not as yet any sign that this decrease has been arrested. As you are aware, the causes of this decrease and the possible remedies to counteract it have been much discussed, and I do not propose on this occasion to touch upon what is a very controversial subject.

Mr. Newlands told us in 1913 that the C.T.O. staff at that time numbered 2,431 men and 1,100 women, a total of 3,531. That number did not include learners, girl probationers, messengers or tube attendants. The comparable numbers at the present time are 1,890 men and 1,200 women, a reduction of 541 men and increase of 100 women. The composition of the male staff has, however, altered. The male staff of 1913 included 399 men on the Cable Room establishment. That establishment now includes 835 men. The number of men on the inland establishment is now 1,012, as compared with almost double that number in 1913.

I may remark here, as a slight alleviation of the dark picture presented by the reduction of the male inland staff, that the proportion of supervising posts to male telegraphists in 1913 was as 1 to 5.3, while on the present establishment it is 1 to 4.7.

In 1913 the total staff, including all grades, was 4,529. The present establishment is 3,972, a reduction of 557 as compared with 1913.

The reduced figure of inland traffic and inland staff may present a gloomy picture, but there is a lot of activity left in an establishment of over 3,000 people.

For many years one of the outstanding features of the office was the inter-communication switch. By its means any Metropolitan office served by a sounder circuit which had a telegram for a London address could be placed in direct communication with the office of delivery, thus avoiding retransmission in the Central Telegraph Office. It was operated in much the same way as a telephone switchboard, apart from the fact that all communications were passed in Morse, and for its purpose it was very efficient. When it was installed in 1903 the number of telegrams handed in at Metropolitan offices and destined for addresses in the Metropolitan area was about 26,000 daily. The telephone service, however, grew so rapidly as to become not only a rival, but a successful rival, for local communications, and the traffic passing through the inter-communication switch gradually fell to a level when it was no longer economical to maintain the switch. It was removed about two years ago and all purely local telegrams in London, of which there are now probably not more than 1,500 or 2,000 daily, are passed direct between office and office through the medium of the telephone system.

About three years ago a new type of concentrator switch was installed for Metropolitan offices which collect but do not deliver telegrams. With this type, which is known, in default of a better term, as the "ancillary" switch, the circuits are led direct to and are multipled on several units, so that a call may be answered at any one of several positions. This arrangement ensures greater availability of staff and provides a speedier service than with the distributor type of concentrator switch. It eliminates the distributing operator of the older type of concentrator and it is an unqualified success for the work to which it is put. How far it would be successful where traffic passes both ways, that is to say, if offices connected with it were delivery as well as collecting offices, is doubtful. If an office were forwarding a telegram to the C.T.O. and the C.T.O. had a telegram for that office, it would be difficult readily to ascertain at which of the several positions the office was engaged and telegrams might get badly delayed in consequence. I do not think that this difficulty is insuperable. It might be met, for example, by some alteration in the design of the switch or by a special lay-out of the wires. At all events, it seems to me that switches of this type, though possibly considerably modified, will eventually supersede the distributor type of concentrator.

In 1913, Mr. Newlands mentioned telewriters. They do not form an important part of the machinery of the Central Telegraph Office, although visitors to the office find them one of the most interesting of our exhibits. At present there are only 10 telewriters as compared with 33 in 1913 and, as a form of telegraphy, they are not likely to survive for long in view of the advance of comparatively cheap types of printing telegraph machines.

As regards the pneumatic tube system, the outstanding change of recent years has been the installation of a tube transmitting centre in the basement of the War Office at Whitehall. The traffic of 11 offices in the south-west of London now pass through this tube centre. Prior to the installation of the tube centre, the work of 10 of these offices was transmitted by morse.

At the C.T.O. the terminals of the pneumatic tubes are divided, some terminating in the Central Hall and others in the Centre Gallery on the third floor. Arrangements are being made to terminate all incoming tubes in the Centre Gallery, and it is the intention that the outgoing tubes shall be associated more closely than they are at present with the delivery room.

Since the war the delivery service has been organised on what is known as the Walk system. The system has been rather severely criticised and the impression has been created that before it was introduced a messenger was always waiting to take out each message as it reached the delivery room. That impression is entirely incorrect. To have a messenger in waiting for every telegram as it arrived would be hopelessly extravagant, and the general practice during the busy hours was to send messengers out with small batches of telegrams for the same neighbourhood. Under the walk plan an organised system replaced an unorganised one. In principle the plan is sound, and the general delivery arrangements were unquestionably improved, but there may be weaknesses in the application of the system. Indeed, I may say that in my opinion the interval between deliveries on the same walk is in some cases rather too long. I was interested to find that in America the delivery was arranged on what was practically a walk system.

A change in connexion with the delivery system has been the introduction of stencilling appliances for the preparation of envelopes for telegrams to registered abbreviated addresses. The system is both economical and speedy.

The stencilling system is also used for the preparation of the copies of multiple telegrams.

The section of the Central Telegraph Office which has seen the greatest increase during the past 15 years is the Phonogram Room. In 1913 the average day's traffic was about 3,500 messages, the number on the busiest day being 6,000. At the present time the average day's traffic is 15,000 messages, and the maximum number dealt with on any one day was 20,000, last Christmas. Of the 15,000, about 4,500 are telephone-telegrams, i.e., telegrams passing between the Central Telegraph Office and other telegraph offices which are served by telephone, the remainder, over 10,000, being phonograms, i.e., telegrams received from or delivered to telephone subscribers.

In 1913 the phonogram work was done by telegraphist staff. To-day it is done by telephonist staff, the establishment of the room numbering 295.

Until about two years ago all incoming traffic was distributed to the operating positions through the medium of a switchboard, but 18 of the 190 incoming, or receiving, positions are now given up to what is called an "ancillary" switchboard. Incoming circuits from telephone exchanges are led direct to this switchboard and multipled in such a way as to permit each of the 18 operators to have immediate access to all of the incoming circuits, that is to say, the distributing operator is eliminated. The results of this switchboard are very satisfactory. With the same operator load as at the positions served through the distributing switchboard, a quicker service is given to the public, or, if the same quality of service is given, a higher output per operator is obtained.

A new phonogram room is in contemplation, and it is likely that it will be equipped with ancillary apparatus, though not necessarily of the same design as the existing switchboard.

A special feature of the phonogram room is the belts under each table for carrying messages from the point of reception to the circulation table. They are a valuable aid in expediting the handling of the messages, and I expect that there will be a considerable extension of this system of collection in the future throughout the office.

In the past 15 years, much has happened in the Cable Room. In 1913, when only lines to the Continent were worked in the Cable Room, Hughes was the predominating machine, 47 circuits being worked by Hughes and 9 by Baudot. In the intervening years the number of circuits worked by Hughes has fallen to 26, while the number of Baudot installations has increased to 30. In the number of working channels, the difference is much greater, there being 65 Baudot channels to 31 Hughes channels.

The Siemens has been introduced since the war and the routes to Berlin and Oslo are now operated by that method. Until after the war, the Cable Room dealt only with telegrams passing between Great Britain and the Continent over the cables crossing the Channel and the North Sea. Since the war its activities have been widely extended. The Imperial Cable to Halifax, Nova Scotia, which on its opening in 1917 was operated by the Inland establishment, was transferred to the Cable Room in 1921, and a second Imperial Cable was acquired in 1922. In the past two years the beam wireless services to Australia, Canada, India and South Africa have been opened. Several wireless services to Continental towns have also been introduced and the Cable Room is in communication through the Rugby radio station with ships on the high seas throughout the world. In May,

1926, the cables to Norway, which up to that time had been operated by the Gt. Northern Telegraph Company, were transferred to the Cable Room.

The Cable Room is now connected by wire with 32 Continental towns, including eight towns in France and seven in Germany. The Threadneedle Street branch office has direct communication with the Bourse offices at Paris, Brussels, Amsterdam and Berlin. The Cable Room has direct wireless services to five Continental towns, with which it is not connected by wire, viz., Warsaw, Bucarest, Danzig, Budapest and Hapsal. It has supplementary wireless services to two towns, Milan and Prague, with which it is also connected by wire.

There is also a wireless service from the Cable Room to Halifax, Nova Scotia, for the transmission of Press messages, and a wireless service has been established within the past few months to Nairobi in the Kenya Colony.

The Cable Room also receives, by wireless, Press messages from Denmark, Finland, Sweden and France.

Experiments are at present being conducted in the transmission of pictures between the Cable Room and the Continent over cable wires. There is, I think, a field for picture, or facsimile, telegraphy, though it seems unlikely that that field will be as extensive as the sponsors of that system think it will be.

About 35,000 telegrams pass daily through the Cable Room, mainly telegrams of a difficult nature, couched in foreign language or in code.

I have already mentioned that in 1913 the Cable Room traffic amounted to about 25,000 messages daily. The difference between the two amounts is practically accounted for by Imperial and Empiradio traffic, and the quantity of Continental traffic, therefore, stands where it did 15 years ago. The position, however, is worse than a stationary one, because in the meantime the Cable Room has acquired the Norwegian cables. Leaving Norway out, there has been a definite drop in the quantity of Continental traffic handled by the Post Office. This decrease is no doubt due to very active wireless competition. Apart from the Marconi services between England and several Continental countries, many, indeed most of the Continental countries have now direct wireless services to America. Wireless competition is sure to become increasingly severe as time goes on, and special attention will have to be given to the cable service if it is to hold its own.

It looks as if the Cable Room has reached its zenith as regards size. In the near future it will lose the Empiradio services and the Imperial cables, and, as members of the Post Office staff, we cannot help regretting the loss of services which we have organised and operated, we are entitled to think, efficiently and successfully, having regard to the large measure of public support which they have attracted.

This concludes my brief review of the changes which have occurred in the Central Telegraph Office during the past decade and a half. I could have extended it considerably, but I did not want to bore you with a multiplicity of detail. The changes have been of a revolutionary character. New machines, new methods and new standards have been introduced and much aptitude has been shown by the staff in equipping themselves to meet the altered conditions of their work. It is not surprising that some of the changes have been received with criticism and at times with resentment by the staff. It is impossible in such a large office to keep the staff fully informed of the reasons and the policy which lie behind the individual changes, but at all events the staff have always done their part in giving the new machines and the new methods a fair trial. They have had to do their work during the past three or four years under the difficulties arising from the building alterations, and I feel that I ought to pay a tribute to their forbearance and the cheerful way in which they have carried on.

In the nature of things it is too much to expect that the right thing has always been done and the right decision always been made, but at all events I do not think it is too much to claim that in the main there has been continuous progress in the direction of keeping the telegraph service abreast of modern machine development in the efforts to maintain an efficient public utility.

EFFICIENCY OF BRITISH TELEPHONE SERVICE.

RELATIVE to an editorial in *The Times* of London, criticising the telephone development of this country, the London correspondent of *Telephony*, Chicago, writes in the issue of that journal for Nov. 3 :—

The administration of telephones in Great Britain is kept under a constant fire of such criticism. Letters and articles appear in the newspapers pointing out this or that unfortunate occurrence and drawing the deduction in every case that these occurrences would not appear in a system of private ownership.

In view of the widespread interest throughout the world in this issue, and the desirability of ascertaining to what extent the criticisms of the British system are fully justified, your correspondent has seen E. A. Mellinger, of the International Automatic Telephone & Telegraph Co., and has asked him for his views of the service in Great Britain. Mr. Mellinger has had ample opportunity to judge the British service, both as it is now and as it has been in the last few years. and his opinion carries particular weight.

" In the first place," he said, " it seems to be desirable to point out that the British Post Office appears to be at a disadvantage in being so inarticulate. It does not seem able to make a reply, particularly during the period when Parliament is not sitting; and even when Parliament is sitting it would seem to be difficult for a government department to formulate a reply unless the criticism is passed across the floor of the House of Commons. This has several influences, perhaps particularly in the direction of the inability of the Post Office to appeal to public psychology.

" In countries where the telephones are a commercial venture, the administrations are able to appeal to public interest by various methods of publicity, and such appeals seem to be impossible to a government department : in fact, it suffers from being a representation of the state at large rather than being the representation of telephone enterprise as a portion of general public utilities. Just so in another sense, it may be said that by having every citizen as its shareholder it suffers from having no shareholders."

" And what do you think," asked the correspondent, " of the position of telephones as part of British Post Office enterprise ? "

" I have no doubt," Mr. Mellinger replied, " that here again the Post Office has its own difficulties. Serving the public throughout the country in so many different ways it would be very remarkable if it did not occasionally come across a jarring nerve which led people to be rather severe in their criticism of other aspects of Post Office work, and the very intimacy of telephones with the public often leads persons discontented on other grounds to visit their criticism on the telephones."

" And what do you think of the quality of service in England ? " asked the correspondent.

" It is a fact that the telephone service in Great Britain is much better than would be gathered by mere judgment of these criticisms," answered Mr. Mellinger. " The underground long-distance lines have now been extended both to the north and to the west, and they gave a service of very high quality. In an area of wide range round London there is a toll system giving an immediate service over a territory much wider than any other similar territory in the world. The development of international telephony, both across the Atlantic and to various countries of Europe, is remarkable."

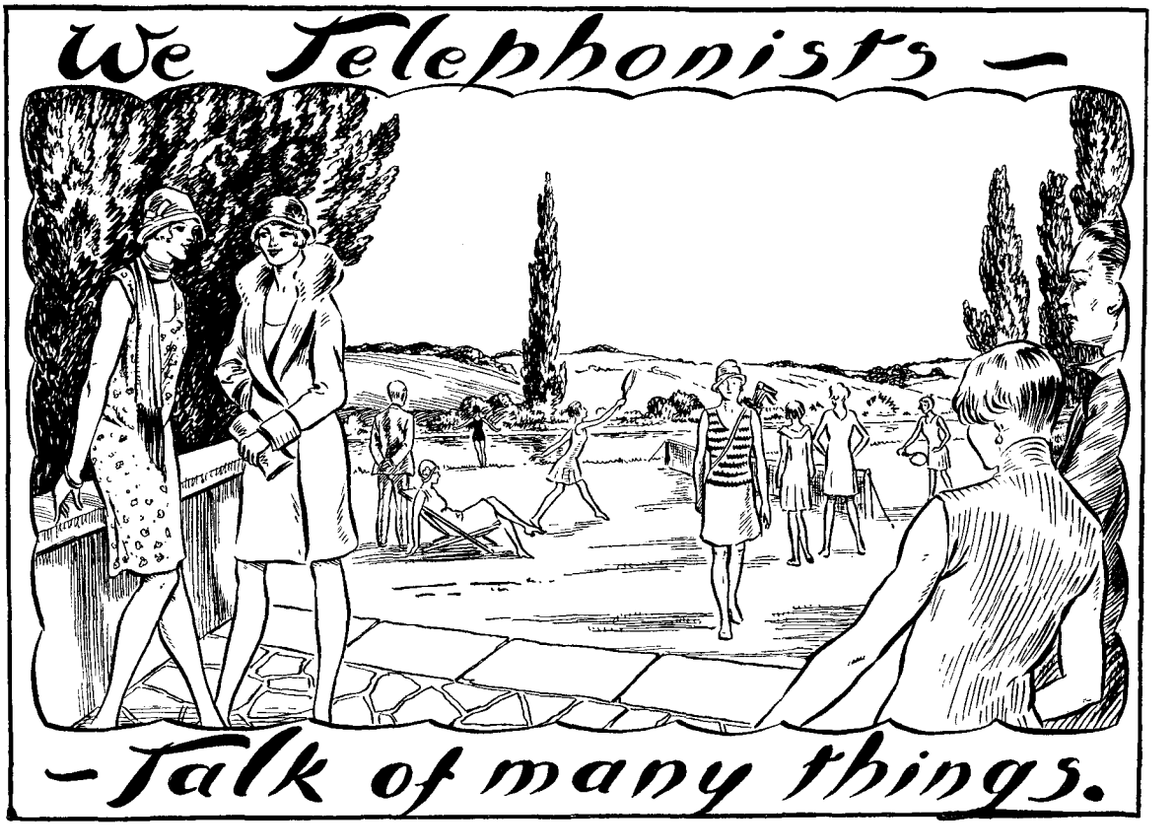
" The advance in the use of automatic telephony in England has been very rapid in the last few years, and indeed has been surprisingly rapid when one remembers that capital is only forthcoming as a portion of the treasury's inclusive consideration of all sorts of national expenditure, so that it is quite possible that such ventures as conversion loans or housing have a bigger influence upon the amount of capital expenditure on telephony than would be readily understood."

" In conclusion," said Mr. Mellinger, " I would say generally, that it is my personal experience and observation that telephone service in London compares favourably with the service in any other large city of the world. It is equal to the best service given in any comparable area, and superior to most, and the present rate of growth has to be considered in its relation to the quality of service which can be given during the process of expansion."

OBITUARY.

MR. R. A. DALZELL.

WE greatly regret to hear, as we go to press, of the death of Mr. R. A. DALZELL, the late Director of Telegraphs and Telephones of the Post Office. Mr. Dalzell only retired in the summer of 1927.



Cats in the Belfry.

IT was rather difficult for me to write because Bindle the Hound had intimated that he desired to go out for a run. He had that irresistible look in his eye and he was asking "What is it master writes so much?" Whenever I put pen to paper he put his nose under my arm and shoved or jumped up behind me and put his red-flannel tongue round my ear. "Look here, Bindle, old man," I said, "can't you see I'm busy? Don't worry." "Well, guvnor," said he, "what *are* you doing?" "I'm writing for the *Journal*," I said, "so go away." "That's the worst of you humans," retorted Master B, "you're always doing stupid, useless sorts of things. Now dogs ——" "Pooh," I said, interrupting him, "what do dogs do—for instance, what do *you* do?" "What do I do!" said he, curling his tail into a question mark, "What do I do!! Well! shiver my gate-post, I like that! What a question! I reckon I've got a most responsible job. You know very well that you couldn't get on without me—and Ye Spratts! what a bother it was to train you. I'll tell you what I do," he continued, and he counted them off on his claws. "I look after you and the missus. I take care of her when you're out and I take care of you when she's in. I take you both out several times a day for the good of your health. I chase burglars away and chivvy the cats out of ——" "Cats," I said. "You've got cats in the belfry." "Oh, bones to that," he replied. "You've got burglars in the attic." I denied the charge testily and pointed out, moreover, that we hadn't such a thing as an attic about the place. "Don't be frivolous," he snapped, and then he suddenly started to laugh silently. "What's the matter?" I asked. He merely shook his head and wiped the tears from his eyes with his paws. "Oh! suffering steaks," he gasped presently, "I was just thinking of the joke I had with you recently." "What joke?" I growled. "Why, when I barked at half-past three in the morning." "That wasn't ——" I began, but he went on, "you did look funny when you tottered downstairs in your pyjamas and poked your head round the door. 'W-w-what's the m-m-matter, B-b-bindle,' you said, 'Is it b-b-burglars?' I nearly burst out laughing, but I managed to let out a fierce growl instead. 'W-w-well,' you said, 'you'd b-b-better g-g-go and see about it.' Of course, it was only old Sandy Cat from No. 6, but out I went with a snort!' 'G-g-good dog,' you said, 'd-d-did you b-b-bite 'em?!' Laugh, I thought I should shake the whiskers off my tail." "Bindle," I said sternly, "do you know what happens to dogs who don't speak the truth?" "No," he replied, "I don't; neither do you, because dogs always speak the truth." "Well, yes," I said, "I believe you're right." "By the way," he said, suddenly changing the subject, "those pyjamas of yours seem to be on their last legs; what about letting me have them for my basket?" "Um, well," I said, reflectively, "I shall have to think about that." "I've rather taken a fancy to them," he went on, "they remind me of streaky bacon—more streak than bacon." "And now," he said, "it's time for your walk. Listen, the wind is in the trees, the leaves are chasing each other like so many pups, the air is sweet and good, there's grass under foot and wide sky overhead and the birds are calling us. Oh, come on, guvnor." He nosed my hand gently, gazed at me with eyes eloquent in appeal, licked me softly and wagged his tail coaxingly. I went, and he was right. Once out, he was of opinion that it would be perfectly stupid of me to return to finish this article. Perhaps he was right again.

PERCY FLAGE.

Something to Look Forward To.

There are those who regard thirteen as an unlucky number, and again there are those that regard it as lucky, and for the future the writer will be found amongst the latter group. The reason is simple—the thirteenth of November found me at the Institution of Electrical Engineers, where, as I was informed, a lecture was to be delivered before the Institution of Post Office Electrical Engineers by Mr. Peck on the subject of "The Director Exchange in Practice." Mr. Peck is, as everyone knows, a lecturer who makes himself master of his subject, and is therefore able to convey to his hearers clearly and succinctly the points he wishes to make, and he has moreover that greatest of virtues in a lecturer—the ability to speak so that he can be followed without effort. Nevertheless, it was with something of a shock that on arriving slightly before the advertised time for the start of Mr. Peck's address I found every seat in the hall taken and the standing space packed five or six deep. After standing for an hour and a quarter listening to an appraisement of the Director System and mentally struggling to reconcile it with such experience as I had of the device, piecing together the while a few comments to be voiced should opportunity offer, I suddenly realised that the Chair had a new occupant—Colonel Purves—and that the whole gathering had risen as one man the while an elderly gentleman, tall and upstanding, with white hair in abundance, and kindly, merry eyes, took his place at the reading desk. Colonel Purves introduced him as Dr. THOMAS WATSON, but to those of us who had read his autobiography, "Exploring Life," he needed no introduction. No wonder this gathering of telephone men did him homage, for, as Colonel Purves pointed out, Dr. Watson as a young man made the first telephone, put up the first telephone wire, and heard the first words ever uttered through a telephone—the original producer of the instrument, the development of which, as the Chairman happily expressed it, had enabled us to secure our bread and butter—though "very little butter." Had he fully appreciated the presence of traffic representatives he would probably have added margarine or dripping!

Well, Dr. Watson told us the story of his association with Graham Bell and held us spell-bound for over an hour. The subject matter of his address may be found almost *in extenso* in his autobiography, and will also, as I understand, appear in the next issue of the *Journal of the Institution of Post Office Electrical Engineers*, and need not therefore be given wholly or in part here; but something must be said of its manner. The Doctor's voice was never raised, and yet he was heard perfectly at the very back of the hall, his speech was musical and expressed every shade of feeling, grave or gay, so that it was a veritable sorrow when his address came to an end, and the hall cleared slowly as if the audience yet hoped to hear more. And although there were no telephonists at that meeting and Dr. Watson has now left to winter in

Africa, they are to have an opportunity, if all be well, to see and hear the Doctor when he returns home to America via London in the Spring, for he has, I am informed, consented to speak at a meeting of the London Telephonists' Society. He had a real welcome at the meeting of the Institution of Post Office Electrical Engineers, but I feel sure his greeting will be at least as warm and wholehearted when he comes amongst the telephonists. Of this, at any rate, I am sure, that if alive and well, though I have to stand for more hours than on the last occasion, he will have amongst his audience of telephonists one who has heard him already and would willingly go anywhere to hear him again.

H. D.

Ravensbourne.

A Sale of Work was held in the Sitting Room of the above exchange on Oct. 20, 1928, in aid of the Elizabeth Garrett Anderson Hospital Fund. The proceeds amounted to £25.

A most successful sale,
Which makes all former efforts pale,
Was organised with great effect,
By a quartette elect
Of willing workers, who,
To our chagrin, made us work, too.
They made us so enthusiastic
We wished our purses were *elastic* !
Such things to tempt us !
Sweets, made by fair hands
That erstwhile held a handset !
Flowers and ferns just fit for Kings,
And there were dainty 'textile' things
That suit the average purchaser, and lest
The owner of a hope chest,
Be forgotten, useful things,
And even serviettes and rings !
All this was in the Sitting Room.
Upstairs, the way to which, 'twas said
Was shown by tape, the usual shade of red,
Were more attractions :—
A baby doll, whose name we guessed,
A cake, its weight we did proclaim,
And sweets, the number we did claim
To know, but all in vain,
The prize, it was not ours to gain.
And then for those whose care
It was to know the future, a lady fair
Did hold *her* court.
And, putting first things last, in our belief,
The best of all was just to have the Chief
To open the bazaar.
The proceeds, as you know,
To the E.G.A.H. fund will go—
£25 ! and more to follow,
For our small box—it was not hollow
Long, and week by week we place our pence
In its wide mouth, with hope intense
That we may never need such help,
Yet gladly *give*.
The proceeds seem quite good, although we're small,
And only outer London after all !

C. D.

London Telephonists' Society : Second Meeting of Session.

Et tu, our Percy Flage ! How could you do it ! By now, methinks, you have begun to rue it. To stand before us, in such heartless fashion, barren of faith, devoid of sweet compassion, with such a theme, soulless and unmajestic—to wit—that "We Teléphs." are not domestic. How seared and scorched our souls ! till, of a sudden, our champion arose "Née(omi) Budden." Dear Mrs. Herbert, how you thrilled and cheered us, as skilfully amidst the rocks you steered us. You told us how your service here had taught you, how there to manage what blind fate had brought you, as in *that sphere, you said (no voice demurring)* you found most things, like history, recurring. Thus, when you reached the front door at the double, 'twas but to find, once more, "wrong number" trouble. And when for bed HE showed a predilection, you used again a somewhat raised "*inflection*." *When, too,* for ancient jokes he had obsession, you kept, *in tact,* your "authorised expression," and though with little cares each day is packed full, you're always "speedy," "accurate" and "tactful." Thus of your *bona fides* quite persuaded, we rose in wrath and Percy Flage upbraided, saying "O thankless child of our adoption, our verdict is : Guilty, without the option."

Contributions to this column should be addressed THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal,* Secretary's Office, G.P.O. (North), London, E.C.1.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE volume of business done by the Contract Branch during the month of October showed a distinct improvement, as indicated by a net increase of 6,587 stations.

These figures create two records—the new business and the net gain figures being the highest ever obtained. The previous highest net gain figure was 6,263, obtained in February this year.

Mr. F. H. Jonghmans, Contract Officer, Class II on the staff of the City Contract Office retired from the service on superannuation on Nov. 17. He had been in failing health for some months past, and his retirement was not therefore altogether unexpected.

Mr. Jonghmans entered the service of the late National Telephone Co. in the South-East District Contract Office on May 21, 1907.

As these notes go to press, the staff of the Contract Branch are making arrangements to present Mr. Jonghmans with a material token of their esteem, and good wishes for his speedy recovery.

The old custom of holding an annual South-East Contract Dinner was revived this year and about 34 of the staff had a very enjoyable evening at the "New Inn" on Nov. 2.

Mr. Rutter, the District Contract Manager, who was in the Chair, said that he was glad to see so many of the staff present enjoying themselves and he rejoiced that these occasions could be arranged, as they did a great deal to maintain the good feeling which existed between the outside and the inside staffs.

The dinner was followed by a concert which included a clever monologue written and declaimed by Mr. McMillan, and entitled "The Kiosk Ghost." A surprise item was also provided by Miss Pidgeon, of the Controller's Office, who sang very charmingly.

* * * *

London Telephonists' Society.

On Friday, Oct. 26, the annual Whist Drive of the London Telephonists' Society was held at the Caxton House Restaurant, Tothill Street, Westminster. Many members and friends were present, and everyone appeared to be having a thoroughly good time.

A feature of the evening, as unusual as it was successful, was the introduction by the President of three novel competitions, which were held before the commencement of the play.

The first competition evoked great excitement. Photographs, taken while they were children, of various Traffic Officers, were displayed, and the object was to guess the identity of the greatest number ; there was a great deal of discussion over this, and it was as amusing to watch the facial expressions of the competitors as it was to hear their comments, as they recognised, or thought they recognised, some of their colleagues.

The other two competitions—one an anagram and the other an acrostic—on any London exchange name, brought in a number of splendid efforts. The result of the competitions was declared after supper and before the second part of the Whist Drive commenced.

The second general meeting of the Society was held on Friday, Nov. 2, at the City of London Y.M.C.A., 186, Aldersgate Street, E.C.1.

A debate was arranged, and the subject chosen was, "Does the work of a telephonist fit her to assume domestic responsibility ?"

There was a very large audience ; members, attracted not only by the topical nature of the subject, were drawn by the fame of the two antagonists.

Mrs. Hubert, who is better known as Miss Naomi Budden, and was before her marriage, a telephonist at Victoria Exchange, took the affirmative side ; while the opposite side of the question was upheld by Mr. R. C. Atkins, who under the pseudonym, "Percy Flage," is so well known to readers of "Talk of Many Things" of this Journal.

Many brilliant arguments were expounded by the opponents, and during the general discussion which followed many members added their opinions. Some of the statements had a delightfully reminiscent flavour, while others indicated flights of fancy based, apparently, on pure theory.

The subject was covered very thoroughly, and in his summing up, the President said that although on the one hand it was claimed that it is because of her occupation, and on the other in spite of her occupation, there is absolutely no doubt whatever, that telephonists do make extremely good wives.

* * * *

Swimming Association Gala.

The annual gala was held at Pitfield Street Baths on Oct. 12. This was the tenth in the series and the interest in this branch of sport seems to increase each year. There were over 200 competitors representing the gentler sex and about 50 men competed in the various events.

The results were :—

Learners' Race for "Agnes Cox" Cup.

Miss Chellew, Primrose Hill	1
Miss Pickford, Hampstead	2
Miss Calnan, Primrose Hill	3

Team Race for "Pounds" Cup.

Regent Exchange (Holders)	1
Gerrard Exchange	2
Trunks Exchange	3

After a thrilling race Regent succeeded in retaining their title of team champions by 1⅘ secs. The sealed handicap held in connexion with this race was won by Western Exchange, Lee Green being second and Paddington third.

Breast Stroke Championship (66 yds.).

Miss House, Regent (59 sec.)	1
Miss McBinney, Trunks	2
Miss Palmer, Regent	3

Supervisors' Championship.

Miss Lloyd, Bishopsgate	1
Miss J. Davies, Avenue	2
Miss Thwaites, Tandem	3

L.T.S. Handicap.

Miss Groom, Regent	1
Miss Rider, Clissold	2
Miss Bryant, Willesden	3

Diving Championship.

Miss McBinney, Trunks (87 pts.)	1
Miss Williams, Regent } (72 pts.)	2
Miss Curnow, Holborn }	

This is the third year in succession that Miss McBinney has carried off this event.

The Shield awarded to the club scoring most points in championship events was won by Regent with 49½ points, Trunks being second with 30 points.

The prizes were presented by Miss Agnes Cox at the annual dance held at Australia House on Nov. 16. The usual happy evening brought the swimming season of 1928 to a fitting end.

* * * *

Football Notes.

The record of the club in the League tournament up to and including Saturday, Nov. 10, reads as follows :—

				Goals		
Played.	*Won.*	*Lost.*	*Drawn.*	*For.*	*Against.*	*Points.*
5	4	1	0	12	4	8

The only defeat was administered by the Land Registry by a penalty goal to none, given towards the end of the game for hands. A goal did not appear likely to accrue at the time and it is claimed that the infringement was purely accidental and did not justify a penalty award. However, it meant the loss of two valuable points when a draw would have been a more equitable result.

The game with the War Office ended in a win by two goals to none, but the points were only annexed after a fierce contest. It was early evident that the War Office, who were strengthened by the introduction of several senior team players, intended to impart plenty of vigour into the game and several of the London Telephone Service players suffered minor injuries.

The game on the whole was scrappy and much below the standard of play of recent matches.

The absence of Gordon through injury disorganised the forwards and the experiment of playing Carver at centre forward was not a success. Cowdray has not yet touched his last season's form, but one shot of his, late in the second half, was reminiscent of his true form.

The first round in the Clay Cup competition will take place on Nov. 24, when we meet Holloway Stores at Chiswick.

In the League Challenge Cup, we have a bye in the first round and are drawn to play the Ministry of Pensions First team in the third round. It was the Ministry of Pensions who, after a fine game, knocked us out of the competition last year by the odd goal in five.

The club will hold their next dance at Cornwall House on Wednesday, Nov. 28, and another will be arranged before Christmas.

* * * *

Lawn Tennis.

The Lawn Tennis Section of the L.T.S. Sports Association held the final for the "Cox" Cup on Saturday, Oct. 13, on the Hard Courts at Regent's Park. Clerkenwell, and A.R. 7, of the Accounts Branch were the finalists. Competition was keen throughout the games and the spectators, numbering about 100, grew very excited towards the close. Cheers from one set of supporters, then the other, as points were scored or lost, marked the progress of the last set, which ended in a win for A.R. 7.

The scores were as follows :—

1st Pairs.—A.R. 7 won, 6—3, 6—3.
2nd Pairs.—A.R. 7 lost, 4—6, 6—8.
3rd Pairs.—A.R. 7 won, 4—6, 9—7, 6—3.

Among the spectators were Miss Cox, the donor of the Cup, accompanied by Miss Epps, Mr. W. R. Bold, the Sup. of Accounts (a tennis enthusiast) and Miss Osler, the Tennis Secretary. Tea was provided in the excellent pavilion adjoining the courts. After tea, the Chairman of the Association called upon Miss Cox to present the Cup to the winners, and medals, from the Association, to last year's victors (Clerkenwell) and to A.R. 7. He expressed the renewed gratitude of the Association for the magnificent trophy presented for the competition. Miss Cox, in handing the Cup to the captain of the winning team, Miss Gardner, referred to the splendid spirit that prevailed throughout the games and her pleasure at being able to attend. The medals were then handed to the players in the final. In concluding, Miss Cox desired particularly to thank Mr. Beck, the Association Secretary and Treasurer, and Miss Osler, the Secretary of the Tennis Section, for all they had done to organise the Competition and bring it to such a successful conclusion.

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Dramatic Society.

An account of the newly-formed Stamford Dramatic Society's performance of "The Young Person in Pink" will be given in these notes next month.

* * * *

Mr. C. R. Bowden.

A large gathering of members of the Traffic Staff met the Assistant Controller's room on the afternoon of Oct. 31 to bid farewell to Mr. C. R. Bowden prior to his departure for the Federal Malay States to take up the position of Superintendent of Posts and Telegraphs.

Mr. Pink, in a happily-phrased speech, expressed the high esteem in which Mr. Bowden was held by his colleagues in the L.T.S., and on their behalf presented him with a suitably inscribed gold wristlet watch and a silver cigarette case. Mr. Bowden made a graceful speech in response.

EX-NATIONAL TELEPHONE RE-UNION.

OVER 400 applications were quickly received for tickets for the Dinner and Re-union of old telephone associates to be held at the New Criterion Restaurant on Monday, Dec. 10.

The interest taken in this assembly of men and women who have worked together for various periods between 1879 and 1912—33 eventful years—in a peculiarly fascinating business is the best justification for this gathering of old telephone brigades.

The evening promises to be one of intense interest, and the correspondence which has taken place has disclosed many diverse and romantic experiences during the 17 years since the transfer.

Ex-officers, some of whom have not seen each other for 20 or 30 years, are coming up to town for the occasion.

The Secretary to the Arrangements Committee, Mr. T. A. Prout, will be at the New Criterion Restaurant, Piccadilly Circus, in the Victoria Hall and adjoining reception-room floor, from 5 p.m., in the event of visitors from the provinces wishing to make any enquiry relating to the evening's Re-union. The reception is fixed for 7, and the dinner half an hour later.

GLASGOW TELEPHONE NOTES.

A FANCY Dress Dance was held by the Douglas Exchange Staff (ladies only) on Friday night, Nov. 2, in Prince of Wales Hall, Sauchiehall Street, Glasgow. The company numbered about one hundred and included representatives from several of the Glasgow Exchanges.

The dresses worn were very beautiful and many of them unique.

During the evening our respected District Manager and wife, Mr. and Mrs. Coombs, visited the Hall and were accorded an enthusiastic reception.

Miss Mortimer, Supervisor, and Miss Caughie, Assistant Supervisor, Douglas Exchange Staff, were present at the dance, the arrangements for which reflected the greatest credit on all concerned. It is hoped that other similar gatherings will take place.

The Mastery of Self.

I was asked the other day what I thought were the three greatest things in life, and when I stopped to ponder I found that there were so many great things—truth, knowledge, love, beauty, fame, courage, kindness—that it was difficult to determine. Then I thought there must be some essentials, and that the reason of life should tell us what these are.

What one considers the greatest things in life vary according to one's disposition and experience, and as one grows older these must necessarily develop and alter.

I feel that the first and last thing in life, the reason of our sojourn in this world, is "the mastery of self." Our present life is like our school time, in which we learn the lessons that will be useful and will fit us for a higher life in the "hereafter": and just as at school we could never understand why certain lessons were necessary, yet in later life we learned the necessity in the application of that knowledge, so in the hereafter we shall benefit by our "schooldays" here if we learn our lessons aright.

"The mastery of self"—to know ourselves and to eradicate what is wrong and arbitrary in our natures so that the good may predominate; to fight and conquer what we know to be our weaknesses and to form a character after our best ideal would, indeed, embody all that is great in life: for in striving to attain this we should require to do that which we feel is most important in life, the accomplishment of some work in life that is worth while, done in such a way that a good influence is felt by those among whom we labour. "For if our virtues did not go forth of us, 'twere all alike as if we had them not. Spirits are not finely touched but to fine issues."

Energy, of which everyone has a given amount, must be utilised. It must have an outlet, and if possible, in a congenial task; for one naturally desires to express one's individuality in the most happy environment. But it so often happens that circumstances force us into a position which is not of our own choosing; and then we find that we must bend to life, for life will not yield to us. And thus we learn to realise that it is not so much *what* we do as *how* we do it that counts in life.

Sympathy plays a large part in the formation of our character because through our thought for others we eliminate selfishness. To help our fellow creatures in sincerity and with cheerfulness, to bring joy and happiness into the circle of our intimate relationships, to give our deep affection to those nearest and dearest to us, these are the greatest incentives to higher effort and the "doings" of life become a joy and the working out of our "karma" a benefit and happiness to others as well as to ourselves.

Such an ideal is indeed difficult of attainment, but if we "hitch our wagon to a star" and learn to benefit by each failure there will come a time when we shall be proclaimed "The Victor," as Browning depicts him:—

"One who never turned his back but marched breast forward,
Never doubted clouds would break,
Never dreamed, though right were worsted, wrong would triumph,
Held we fall to rise, are baffled to fight better,
Sleep to wake."

M. L. TULLOCH.

Glasgow Echoes.

ODE TO THE TRAFFIC BRANCH.

This branch is truly an arduous section;
No wonder—they meet every objection
From morning till late, without restraint,
They deal with many a fault and complaint,
Their duty it is to eliminate waste
And other things truly not to their taste.

ODE TO THE CONTRACT BRANCH.

This little company in work exults,
But does all it can to produce "results,"
With maxim, gesture and winning smile,
Until the subscriber thinks it worth while
To sign an agreement, his name to appear
In the Telephone List for the ensuing year.

R. A. THOMSON,
Boy Messenger (Telephones).

LIVERPOOL TELEPHONE NOTES.

JAMES M. MOYES (Daddy) has left us. A long-standing disability, borne patiently and cheerfully, has at last necessitated his retirement. His departure creates a gap which, on account of his personality, will be difficult to fill. He will be well known by many telephone people outside the Liverpool District, and we are sure that all who have associated with him will join with us in hoping that, freed from the every-day cares of active duty, he will long remain on the debit side of the Service Revenue Accounts. May his health remain such that he can still enjoy social pleasures.

Another distinct personality in Miss Eileen Jones has also gone from from us. The lady in question has taken *the* serious step and, of course, the occasion was marked by a wealth of gifts, together with much fluttering amongst the fair members of the staff. Miss Jones was associated with the organisation of many social functions of the Post Office, and, as she has made her choice from the Service, we shall no doubt see something of her in the future.

With the coming of winter the good work previously carried on in the district has been continued. A programme has been drawn up in connexion with staff meetings, and it is hoped that the good results obtained last session will be further enhanced. A dance organised by the Central Exchange was held at the Grafton Rooms on Nov. 15, and upwards of 500 of the very young, young, and not so young, spent an enjoyable evening.

We would like to add our congratulations to those of Glasgow in wishing every future happiness to Mr. J. J. O'Rourke, late of Liverpool Traffic. Are there, by the way, any auction rooms in Glasgow, or is every purchase a bargain ?

MANCHESTER NOTES.

THE Manchester Supervising Officers are clearly resolved to take the fullest advantage of every opportunity to acquire an intimate knowledge of Manchester's new automatic system, consequently there was again a full muster on the evening of Oct. 14, when Mr. J. L. Parry gave the second lecture of the series on Automatic Telephony.

The mysteries of the switching apparatus were further explored, investigation being greatly facilitated by the use of switches made available by the courtesy of the A.T.M. Co. and lantern slides borrowed from the Engineer-in-Chief's Training School.

Questions increased in number and complexity and a very interesting discussion ensued.

It is understood that the local branch of H.M. Stationery Office is experiencing a steady demand for the pamphlet, the subject of which is Automatic Telephony, and that supplies have become temporarily exhausted.

AIR PICTURES.

TELEVISION DEVELOPMENT IN THE U.S.

BY THE AIR CORRESPONDENT OF THE "DAILY MAIL," AUG. 1.

IN connexion with recent developments in television in the United States, great secrecy is being observed regarding a device which is about to be tested at one of the United States Government air-stations.

It is claimed that a pilotless aeroplane will be able to record, and transmit to a ground station, all that is visible around it as it flies.

A feature of the mechanism is said to be a system of lenses, projecting above, below, and on either side of the body of the aeroplane. Through these will pass pictures of all that lies within visual range; after which, by a combination of wireless and of light-sensitive cells, these images will be flashed from the aircraft and reproduced on a screen in front of an operator at the ground controlling-station.

[We think this must have been communicated by our contemporary's "hot air correspondent." Aerial photographs even when clear, sharp, and well-defined have their limitations, and it is suggested that television has none. Yet no one has seen a sharp "televised" picture. It may, of course, be merely a publicity stunt. Those publicity people are very clever in their efforts to find a "best seller"! But possibly the paragraph is only an outcrop of leg pulling—a common disease in the holiday season—and we may wake up one morning to find the writer of it recommending television as a means of solving all knotty problems, and urging us to try it for filling up Income Tax forms, spotting a winner, or finding a lost collar stud.]

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

By HARRY G. SELLARS.

(*Continued from page* 20.)

1869, Jan. 1 ... Money Order system established between United Kingdom and Switzerland, with commission at inland rates.

1869, Jan. 26... Dr. Emanuel Herrman, of Vienna, suggested the use of postcards. They were introduced in Austria on Sept. 25, 1869.

1869, July 1 ... Money Order system established between United Kingdom and Belgium.

Bright improved his duplex apparatus and his acoustic "Bell" telegraph.

Committee formed to determine a system of electrical units reported.

Franco-American cable laid.

West India and Panama Telegraph Company obtained subsidies for certain cables in West Indies from English and French Colonies.

Elisha Gray and Enos M. Barton, of U.S.A., entered into partnership for the manufacture of electrical instruments.

1869, Dec. 11... William Alfred Marshall, of London, patented a method of enclosing wires in lead piping and insulating them with paraffin wax.

Marshall invented an earth borer with a circular cutting plate for use when erecting telegraph poles.

Post Office began to issue dog licences.

Net revenue of Post Office, £1,404,886.

1870, Jan. 18... Cable completed between Salcombe, Devonshire, and Brest for Compagnie Française des Cables Télégraphiques.

1870, Jan. 28... Telegraphs transferred to the State. Capital Stock to the value of £10,948,173 was created to compensate the Electric and International, the British and Irish Magnetic, the United Kingdom Electric, and other telegraph companies. Post Office began the service with 1,000 postal telegraph offices and 1,800 offices at railway stations. About 60,000 miles of wire in use. Income at that time was about £550,000 per annum and the number of telegrams transmitted, 6,000,000. Charge for Inland Telegrams fixed at 1*s.* for 20 words (names and addresses free). Press rate for telegrams fixed at 1*s.* for 100 words at night, or 75 words by day, with an additional charge of 2*d.* per 100 or 75 words for transmission to each additional address.

1870, June 21 Cable laid between St. Mary, Scilly Islands, and Bottallack, Cornwall.

Alexander Muirhead devised a telegraph recorder somewhat similar to Kelvin's syphon recorder, and invented a transmitter which hastened the discharge of a cable at the end of a working signal.

Muirhead, in collaboration with Herbert Taylor, devised a method of duplexing cables.

(S. G. Brown, Axel Orling and Heurtley invented the "drum" relay, "liquid jet" relay and a signal magnifier for cable working, respectively.

G. O. Squier devised a system of cable working using low frequency alternating currents.)

1870, Oct. 1 ... Post cards introduced in England.

1870, Oct. 1 ... Pattern and Book Post rate reduced to ½*d.* for every 2-oz. Limit, 12 oz.

1870, Dec. 27... British Government, acting on information supplied by Count Bernstoff, Prussian Ambassador, seized in the Thames a vessel named *International* which had on board a cable destined for the French coast.

Expedition of seven vessels sailed with cables for the West Indies.

Two telegraph cables to Holland and one to Germany acquired by Post Office and leased to the Submarine Telegraph Company.

Penang-Australia cable laid.

Cyrus Field (U.S.A.) proposed a cable route from California to China via Alaska and Japan.

Wheatstone and Stroh's automatic telegraph worked at 70 to 80 words a minute.

Varley invented the "cymaphen" for the purpose of conveying sounds by wire.

Indo-European Telegraph Company's route overland to Teheran completed.

Central News established.

Professor Fleeming Jenkin demonstrated the electrical capacity of a submarine cable.

Series of electrical units adopted by the British Association brought into use in Great Britain and her Colonies.

Number of telegrams dealt with during the year—10,000,000.

9,750,000 Money Orders issued.

India Mail sent via Belgium and Germany to Brindisi.

Annual average number of letters passing through the Post Office, 791,000,000.

Net Postal Revenue, £1,449,315. Profit on Telegraphs, £47,425.

Stamped newspaper wrappers introduced.

An Act of Parliament established a postage rate of ½*d.* for newspapers.

Messrs. Reuters opened an office in Old Jewry, London.

Holmes and Van Malderen constructed a magnetic-electric machine in which sixty-four separate coils rotated between the poles of forty magnets.

Great Northern Telegraph Company's communication with Vladivostock completed.

Gramme constructed a dynamo-electric machine with a modified ring armature and invented a continuous current generator.

Bernard Meyer devised a multiplex telegraph with four channels. The keyboards had eight keys (black and white, like piano) and morse characters were printed at the receiving end.

1871, May 1 ... Money Orders issued with commission ranging from 1*d.* for 10*s.* to 1*s.* for £10.

1871, June 11 Morse statue unveiled in New York and in the evening Morse addressed a meeting of people interested in telegraphy.

1871, Oct. 5 ... Pattern Post abolished.

1871, Oct. 5 ... Rates of postage altered to 1*d.* for first ounce, for the second ounce ½*d.*, for every succeeding two ounces up to 12 ozs., ½*d.* Above 12 ozs. for every ounce, including the first 1*d.*

Postmaster-General anticipated the time when free delivery will be provided for every house in the country at least two or three times a week.

Rates for Money Orders to Belgium and Switzerland raised to scale ranging from 9*d.* for £2 to 3*s.* for £10.

Antonio Meucci patented, at Washington, a telephonic apparatus, after having submitted it to the President of the New York District Telegraph Company.

1871, Oct. 21 Telegraphists' Association formed in England. Suspension of its leaders and a strike followed.

Eduard Friedrich Weber died.

Duplex telegraph working introduced in Postal Telegraph Service.

Wheatstone patented a mercury relay for telegraphic work.

Elkington precipitated copper by electrolysis from fused sulphate of copper and iron.

International Telegraph Conference in Rome.

103,000,000 newspapers passed through the post.

About 75,000,000 postcards passed through the Post Office.

1872, Jan. 5 ... Indian Mail sent via Calais, Mont Cenis tunnel, and Brindisi.

1872, March ... Edmund Yates left the Post Office service.

1872, April 2... Samuel Finlay Breese Morse died in New York.

1872 ... ... Thomson's steel wire sounding apparatus was introduced, thereby rendering a close and accurate deep-sea survey practicable.

Baudot tried to combine the Hughes printing telegraph with the multiplex system used by Meyer in 1871.

Wheatstone devised a telegraph tape perforator.

Reuters introduced the "packed" telegram and accepted messages for retransmission.

Western Electric Manufacturing Company formed to take over business of Gray and Barton.

Arlincourt devised a writing telegraph system.

Meyer devised a six-channel multiplex morse telegraph system.

Exchange Telegraph Company established.

Hefner-Alteneck constructed a dynamo-electric machine with a drum armature.

International Telegraph Conference in Rome, Great Britain being represented for the first time. British delegate, Alan E. Chambre, opposed "urgent" telegrams.

British Post Office Savings Bank deposits, £6,664,629.

1873 ... ... Latimer Clark invented a voltaic cell made up of platinum, mercurous sulphate, zinc, and zinc sulphate. Dr. A. Muirhead and Lord Rayleigh improved the construction of the cell.

Skrivanoff modified a zinc-carbon cell made by Latimer Clark and rendered it dry.

Siemens and Halske introduced a self-exciting dynamo with drumwound armature and a bar commutator.

Von Hefner Alteneck modified the shuttle-shaped armature for magneto-electric machines devised by Siemens.

Edison devised a carbon rheostat.

1873, Sept. 1... Compulsory registration extended to letters containing jewellery and watches.

Meyer exhibited at the Vienna Exposition his four-channel multiplex telegraph system using morse code.

Edison introduced tape for transmitting signals in which the words to be telegraphed were perforated.

Anglo-American Telegraph Company's first cable laid from Valentia (Ireland) to Heart's Content (Newfoundland).

1873 ... ... Light-sensitive properties of selenium discovered by telegraph operator named May at Valentia.

Willoughby Smith confirmed that selenium changes its electrical resistance when under the influence of light. Prof. W. G. Adams found that the change of resistance varies directly as the square root of the illumination.

Hippolyte Fontaine, at the Vienna International Exhibition, accidentally discovered that a dynamo would act as a motor when supplied with current.

James Clerk Maxwell showed that an electrical oscillation in a circuit would give rise to an electro-magnetic disturbance which would travel as a free wave. He postulated that light was an electro-magnetic wave.

1874, Feb. 4 ... Central Telegraph Office, London, transferred from Telegraph Street to General Post Office (West).

1874, Mar. ... Physical Society of London formed by Professor Frederic Guthrie, who published an important work on *Magnetism and Electricity*.

1874, April 25 Guglielmo Marconi born at Griffone.

1874, Sept. 15 Nations meet at Berne to discuss proposed Universal Postal Union.

1874, Oct. 19 International Postal Union constituted. Discussed a proposal for allowing letters with declared value to pass in international mails. Question left undecided. Agreed to free redirection of letters throughout the Union.

Alfred Mayer studied the effect of magnetisation on iron and steel bars.

Direct United States Cable Company's cable laid.

Emile Baudot invented a synchronised multiplex type-printing telegraph system using a 5-unit alphabet, the signals being forwarded by means of five keys and received in Roman characters on paper tape.

Hardy introduced a planetary gear between the governor and the distributor of Meyer's multiplex telegraph. Baudot also devised a correcting arrangement.

(*To be continued.*)

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CONTENTS.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LX.—MR. JOHN R. GALL.

MR. JOHN R. GALL, the subject of this month's biographical sketch, entered the service of the United Telephone Co., Ltd., in Oct., 1887, and after gaining experience in several exchanges was appointed assistant to the late Mr. J. W. Ullett, in 1889, in which position he remained for some four years. During this time a great deal of original research work was carried out, particularly in connexion with the development of the multiple switchboard, the Liverpool telephone transformer and the design of subscribers apparatus. He took an active part in the estimating for and the erection of some of the first Trunk lines between London and the North of England. He was also concerned in the inauguration of the electrophone at the Savoy Theatre in the palmy days of Gilbert and Sullivan, this being the first London theatre from which telephone transmissions were given to the public.

In 1893 when, following the completion of the amalgamation with the National Telephone Company, the Engineer-in-Chief's Dept. was formed with Mr. Dane Sinclair at its head, Mr. Gall was entrusted with the formation and control of the Test Section. In these early days the functions of this section were numerous, including the design and acceptance of all apparatus and materials used by the Company, the supervision of electric light, power, and heating installations and experimental and research work. Mr. Gall retained this position until the transfer of the Company's undertaking to the Post Office, and during the whole period of the arbitration proceedings, when he was responsible *inter alia* for the production of the many models exhibited for the assistance of the Court. He was appointed Staff Engineer in the P.O. at the transfer in January, 1912, and took charge of the Test Section on his release by the Company in January, 1913.

Since 1919 he has been the head of the Designs Section, a capacity for which his training and experience eminently fit him.

We believe that Mr. Gall finds relaxation in gardening and, anyhow, he is the best of good fellows.

TELEPHONE DEVELOPMENT OF THE WORLD AT 31ST DECEMBER, 1927.

BY W. H. GUNSTON.

THE collected statistics of the telephonic development of the world at the end of 1927 show that since Dec. 31, 1926, about 1,470,000 telephones have been added to the total, and, as an increase of about a million and a half has been fairly constant during recent years, it may safely be estimated that there are at the present time about 32 and a half million telephones in service on the earth.

The totals for 1926 and 1927 are distributed as follows :—

	Dec. 31 1926. (*Thousands.*)	*Dec.* 31, 1927. (*Thousands.*)
Europe	8,020	8,541
Asia	963.5	993.5
Africa	168.5	187.5
North America	19,120	19,958
South America	427.7	439
Australasia and Oceania	578.5	630
	29,278	30,749

The figures for 1926 have been adjusted slightly (vide article on the same subject in the *Journal* of Jan. 1928) in the light of later information.

Europe shows an increase of 521,000 or 6.4% on the preceding year, whilst North America increased by 838,000 or 4%. Last year the increases over the preceding year were 7% and 5% respectively.

The statistics in the annexed tables are all obtained from official or authoritative statistics for 1927, except that in the cases of Russia, Poland, Finland, the South American States, and some less important countries, they are obtained from estimates based on the official figures for 1926. The notes subjoined to the tables give fuller information on this point.

The following table shows the number of telephone stations per 100 inhabitants of the chief telephone-using countries at the end of 1927 :—

United States	16
Canada	12.7
New Zealand	9.9
Denmark	9.2
Sweden	7.6
Australia	7.4
Norway	6.3
Switzerland	5.5
Germany	4.4
Great Britain	3.6
Netherlands	3.2
Finland	3.1
Austria	2.4
Belgium	2.4
France	2.1
Argentina	2.1

This list includes all States possessing upwards of 100,000 telephones and a density of at least 2 telephones per 100 population.

It is to be observed that the figures of population on which these ratios are based are those estimated for 1926 in the League of Nations handbook, or figures supplied by the Administrations themselves. This will account for an apparently retrograde figure of telephone development in some cases where last year's ratios were based on old census returns. In Great Britain despite the fact that over a million and a quarter has been added this year to the population figure (for the sake of the additional accuracy obtained by using the League of Nations' figure instead of—as formerly—the 1921 census) there is nevertheless an increase of 0.2 telephone per 100 inhabitants in the recorded telephone density.

EUROPE.

From the annexed table (I) it will be seen that there is one telephone to every sixty inhabitants in Europe. The development of Europe, however, shows a much better aspect if the relatively undeveloped East and South are left out of consideration. In the Western and Northern part of Europe, comprising Scandinavia, Germany, Austria, Switzerland, Holland, Belgium, France, Great Britain and Ireland, there are about 188 and a half million inhabitants and over 7.1 million telephones, a ratio of 26 to 1.

The principal increases in growth took place in Germany, 126,501 (nearly 5%); Great Britain, 122,217 (8%); France, 60,536 (7.3%); Belgium, 20,074 (nearly 12%); Sweden, 16,121 (3.5%); and Switzerland, 12,989 (6.5%). The apparent heavy increase in Italy is due to the fact that the figures for 1926 and 1927 were obtained from different sources. The total of 272,433 for 1927 (obtained from an American source) is probably more accurate than the round figure shown for 1926.

I.—EUROPE.

Country.	*Population (thousands).*	No. of Telephones. *Dec.*31,1926.	No. of Telephones. *Dec.*31,1927.	*No. of Inhabs. per telephone.*
Austria	6,750	158,078	165,613	40
Belgium	7,875	173,681	193,755	40
Bulgaria	4,861	12,750	14,358	340
Czecho-Slovakia	14,353	130,235	136,614	105
Danzig	356	17,157	17,466	20
Denmark	3,460	315,984	319,554	10.9
Esthonia	1,250	12,290	13,500*	93
Finland	3,402	99,331	108,000*	31.5
France	40,925	822,870	883,406	46
Germany	63,100	2,688,495	2,814,996	22.4
Great Britain	45,500	1,511,585	1,633,802	27.8
Greece	7,000	5,500	5,620	1,250
Hungary	7,482	80,183	88,961	84
Iceland	94	3,355	3,811	25
Irish Free State ...	2,975	24,583	26,084	114
Italy	40,425	210,000	272,433	148
Latvia	2,000	24,192	29,165	69
Lithuania	2,000	9,600	9,864	204
Luxemburg	263.8	8,579	9,000*	29
Netherlands	7,526	226,952	240,611	31
Norway	2,788	174,500	176,000	15.7
Poland	29,589	135,347	145,000*	204
Portugal	5,775	21,850	24,000	240
Russia	146,989**	241,378	260,000*	565
Rumania	17,000	47,692	56,000	303
Serbs, Croats, and Slovenes, Kg. of ...	12,800	27,979	32,801	390
Spain	22,285	134,860	142,000	157
Sweden	6,074	450,646	466,787	13
Switzerland	3,959	210,486	220,615	18
Turkey	2,000	10,907	11,389	176
Total (including estimates for the Saar District, Gibraltar, &c.) ...	514,300	8,020,000	8,541,000	60

* Estimated. † From an American source. ** 112,000 in Europe.

The figures for Esthonia, Finland, Luxemburg, Poland, and Russia are based on the anticipated increase on last year's figures.

The official information obtained from Norway showed the development of the State system at June 30, 1927, and of the private systems at Dec. 31, 1926. It has been necessary to estimate the probable increase of these systems up to December, 1927.

The telephone system of Great Britain consists of :—

Post Office system	1,598,916
Hull Municipal system	15,422
States of Guernsey system	4,053
States of Jersey system	3,091
Railway and private telephones with exchange facilities	12,320
	1,633,802

II.—ASIA.

Countries.	*Telephones.*
Ceylon	8,383
China	125,000†
French Indo-China	5,186
Federated Malay States	5,874
India (47,624)	53,000*
Iraq	1,037
Japan (proper) (636,727) ...	641,030
Chosen (32,061)	34,000*
Formosa (Taiwan) (12,818)...	13,000*
Quantung (17,217)	18,000*
Saghalien (3,807)	4,500*
Netherlands East Indies (43,329)	46,404
Palestine	2,945
Persia	3,449
Phillipine Islands (17,814) ...	18,500*
Siam...	2,000*
Straits Settlements—	
Penang, 1,750*	9,000
Malacca, 500	
Singapore, 6,714	
Turkey in Asia	2,000*
	993,500

* Estimated from last year's figures.

† From an American source. The number of stations on the Chinese State telephone system is 34,743, but there are also several companies operating in China.

As there are at least 10,000 telephones in Russia-in-Asia (included in the statistics for Europe) it will be seen that there are now over a million telephones in Asia.

The population of Asia is estimated at 1,013,000,000 and the number of inhabitants per telephone is therefore 1,013.

III.—AFRICA.

Countries.	*Telephones.*
Algeria (24,060)	28,305
Belgian Congo	800
Egypt (36,778)	39,054
Kenya and Uganda	2,000*
Mauritius (1,098)	1,133
Madagascar (1,474)	1,600*
Morocco	7,415
Nigeria and Cameroons	1,709
S. Rhodesia	2,741
South Africa (81,659)	88,880
S.W. Africa	1,165
Tunis (9,942)	10,500*
Other places	2,000
	187,500

* Estimated. The figures in brackets show the number of telephones in 1926.

Population 143,000,000. Inhabitants per telephone 763.

IV.—NORTH AMERICA.

	Population (thousands).	*Telephones.*	*Inhabitants per telephone.*
United States of America (17,746,152) ...	115,920	18,523,500	6.26
Canada (1,204,691) ...	9,597	1,265,869	7.6
Mexico (57,563)... ...	15,500	60,000	258
Cuba (65,216)	3,500	68,000	57
Porto Rico (13,374) ...	1,300	14,500	89
Other West Indies ...	3,500	5,000	—
Central America (20,283)	6,500	21,000	309
	155,800	19,958,000	7.8

The figures in brackets show the number of telephones in 1926.

The development of Mexico, Cuba, Central America, &c. is estimated from figures obtained from an American source.

The total of the *United States* is made up as follows :—

	Telephones.
American Telephone and Telegraph Co. and Associated Companies	13,726,056
Independent Companies in connexion with above	4,639,430
Entirely Independent	158,000
	18,523,486

The increase in stations over 1926 was 777,348 (or 4.4%).

Canada.—The total number of telephones was thus distributed amongst the provinces :—

	Telephones.
Ontario	561,043
Quebec	262,784
British Columbia	108,556
Saskatchewan	106,215
Manitoba	74,124
Alberta	73,634
Nova Scotia	41,716
New Brunswick	31,397

The total increase was 61,178 stations (or 5%).

V.—SOUTH AMERICA.

	Population (thousands).	*Telephones.*	*Inhabitants. per telephone.*
Argentine (204,463) ...	10,312	220,000	47
Bolivia	—	2,000	—
Brazil (105,209) ...	36,871	108,000	340
Chile (36,860)	4,750	39,000	122
Colombia (18,875) ...	8,057	20,000	402
Ecuador	—	4,500	—
Paraguay	—	500	—
Peru (13,299)	6,000	15,000	400
Uruguay (26,915) ...	1,720	27,500	63
Other places	—	2,500	—
	77,791	439,000	177

The development of South America is estimated from the official figures for 1926, the latest obtainable.

The figures in brackets show the number of telephones in 1926.

VI.—AUSTRALASIA AND OCEANIA.

	Telephones.	*Population (thousands).*	*Inhabitants per telephone.*
Australia (424,442) ...	461,715	6,234	13
New Zealand (Mar. 31/28)	144,552	1,453	10
Hawaii (19,648) ...	20,500	256	12.5
Other places in Oceania	3,000	700	—
	630,000	8,800	14

Australia.—The telephones are thus distributed amongst the various States.

New South Wales	175,301
Victoria	143,700
Queensland	55,351
South Australia	49,881
Western Australia	24,574
Tasmania	12,908

The increase over 1926 is 37,273 or 9%.

CITIES WITH UPWARDS OF 100,000 TELEPHONES.

	Telephones.	*Inhabitants per telephone.*
New York	1,599,915	3.8
Chicago	903,460	3.5
London (telephone district) ...	565,590	13.2
Berlin	448,030	9.0
London (Administrative County) ...	429,422	10.4
*Boston (Mass.)	416,784	4.3
Philadelphia	399,404	5
*Los Angeles	333,971	3.8
Paris	311,373	9.0
*Detroit	291,917	5.5
San Francisco	239,155	3.0
*Cleveland	211,014	5.2
*St. Louis	201,421	5.3
*Pittsburg	200,685	4.8
Toronto	173,264	3.8
*Montreal	161,380	5.5
Hamburg—Altona	157,710	8.3
*Cincinnati	154,021	4.4
Washington	147,347	3.5
*Milwaukee	137,303	4.8
*Kansas City	136,938	4.6

	Telephones.	*Inhabitants per telephone.*
*Copenhagen	133,743	6.8
Tokyo	125,649	17.0
Baltimore	124,761	6.5
Minneapolis	122,279	4.9
Buffalo	117,184	5.2
Stockholm	114,923	3.5
*Oaklands (Cal.)	114,506	4.2
Buenos Aires (1926)	112,137	18
Seattle	109,645	3.6
Vienna	105,420	17
*Sydney	103,254	16.9

* Including suburbs.

CITIES WITH UPWARDS OF 10,000.

United States :—(The chief of these are in the foregoing table).	158
Germany :—(Berlin 448,030, Hamburg 157,710, Munich 66,396, Leipzig 62,309, Cologne 61,682, Dresden 55,431, Frankfurt-Main 54,416, Düsseldorf 40,496, Breslau 39,619, Stuttgart 38,839, Hanover 33,262, Nuremberg 32,582; Bremen, Essen, Mannheim, Chemnitz, Duisburg, Magdeburg, Königsberg, over 20,000; Dortmund, Stettin, Elberfeld, Halle, Kiel, Barmen, Cassel, Aachen, Brunswick, Karlsruhe, M. Gladbach, Crefeld, Wiesbaden, and Erfurt, over 10,000)	33
Great Britain :—(London 565,590, Manchester 54,439, Liverpool 50,788, Glasgow 50,401, Birmingham 42,784, Edinburgh 23,717, Leeds 18,676, Newcastle-on-Tyne, Bradford, Hull, and Sheffield each over 16,000; Bristol over 15,000; Cardiff, Belfast, and Nottingham over 13,000; Leicester over 11,000; and Bournemouth over 10,000)	17
Canada :—(Toronto 173,264, Montreal 161,380, Ottawa 35,252, Quebec 20,547; Vancouver, Winnipeg, Hamilton and Windsor (Ont.), London (Ontario), Victoria (B.C.), Halifax (N.S.), Edmonton, and Windsor (Ont.), between 10,000 and 30,000) ...	12
France :—(Paris 311,373, Lyons 21,827, Marseilles 20,911, Bordeaux 13,558, Lille 12,049, Strasbourg 11,793, Nice 10,048)	7
Japan :—(Tokio 125,649, Osaka 86,100, Kyoto 29,107, Kobe 25,036, Nagoya 24,980, Yokohama 12,696)	6
Australia :—Sydney 103,254, Melbourne 85,884, Brisbane 21,701, Adelaide 29,514, Perth 13,960)	5
Switzerland :—(Zurich 30,730, Geneva 17,250, Basle 17,040, Berne over 14,000)	4
Italy :—(Milan 28,507, Rome 19,900, Turin 12,479, Genoa 11,131) ...	4
Netherlands :—(Amsterdam 41,057, Rotterdam 35,643, The Hague 33,265)	3
Belgium :—(Brussels 66,532, Antwerp 27,864, Liége 13,390) ...	3
Sweden :—(Stockholm 114,983, Göteborg 31,483, Malmö 15,875) ...	3
New Zealand :—(Auckland 17,460, Wellington 17,167, Christchurch 11,188	3
Russia :—(Moscow 65,350, Leningrad 53,090)	2
Spain :—(Barcelona and Madrid each over 20,000)	2
Norway :—(Oslo 42,609, Bergen 10,200)	2
India :—(Calcutta 13,599, Bombay 12,000)	2
Egypt :—(Cairo 15,555, Alexandria 11,125)	2
South Africa :—(Johannesburg 24,156, Cape Town 14,961) ...	2
China :—(Peking 42,000, Shanghai 26,000)	2
Argentina :—(Buenos Aires 112,137*)	
Austria :—(Vienna 105,420)	
Brazil :—(Rio de Janeiro 37,778*)	
Chile :—(Santiago 10,978)	
Czecho-Slovakia :—(Prague 19,240)	
Cuba :—(Havana 45,043*)	
Danzig :—(Danzig 10,892)	
Denmark :—(Copenhagen 133,743)	
Hungary :—(Budapest 37,455)	17
Ireland :—(Free State, Dublin 14,691)	
Latvia :—(Riga 12,311)	
Mexico :—(Mexico City 33,776*)	
Poland :—(Warsaw 39,000)	
Portugal :—(Lisbon 16,151)	
Rumania :—(Bucharest 12,500)	
Turkey :—Constantinople 11,389)	
Uruguay :—(Monte Video 16,025*)	
* At Dec. 31, 1926.	289

Of these 289 cities, 172 are in North America, 91 in Europe, 10 in Asia, 8 in Australasia, and 4 each in Africa and South America.

It may be added that there are 60 cities and their suburbs in the world with upwards of 50,000 telephones. Of these 35 are in the United States, 7 in Germany, 4 in Great Britain, 2 each in Australia, Canada, Russia, and Japan, 1 each in Argentina, Austria, Belgium, Denmark, France, and Sweden.

SOME REFLECTIONS ON THE TELEGRAPH SERVICE.

I AM not so sanguine as to suppose that what I have to say is in any sense original; on the contrary, the principles which I am about to lay down are as old as the Telegraph service itself.

Nevertheless, believing as I do that Truth is great and must ultimately prevail, I am emboldened to set forth certain fundamental requirements which must be fulfilled if in any wise the Telegraph chestnuts are to be pulled out of the flames:—

(1) There must be greater stability coupled with (so far as that may be possible) greater uniformity of apparatus: Until our engineering friends can provide us with more stable and more uniform types of apparatus there can be no *sustained* increase of output.

(2) There must be a more even flow of traffic so that plant may be employed to something approaching its full capacity. No doubt the subject bristles with difficulties, but it should not be beyond the wit of man to devise such modification of the existing tariff as would, in some measure at any rate, secure this end.

(3) The fact that we are living in an age of mechanical and scientific development bewildering in its complexity and in the rapidity with which new ideas are constantly assuming concrete form, calls for the closest and most sympathetic co-operation between all those to whom the interests of the Telegraph service are of vital concern.

(4) Some incentive to effort must be forthcoming if the best results are to be obtained from the rank and file. If this cannot be provided along the recognised avenues of promotion, then some other means of providing it must be devised. Cases of slackness should, of course, be suitably dealt with, but these are happily comparatively rare and do not call for the wholesale application of coercive methods. The experience of the world has demonstrated that it is impossible to devise any system of compulsion which will induce men in the mass to work as efficiently and as intelligently as they willingly do for the hope of reward. If proof of this be needed it may be found in the multiplication of profit-sharing schemes which is so outstanding a feature of industrial life to-day.

Co-operation, trust, confidence, enthusiasm—these are the qualities which lie at the root of all commercial success.

It may well be that the halcyon days of the telegraphs are gone forever, yet I cannot but think that a clear apprehension of the principles here set forth—and I am sensible they are by no means exhaustive—would, in the hands of a wise and sympathetic administration, go far to re-establish the service in public favour and to reduce that annual deficit which is the *bête-noir* of successive Postmasters-General.

MENSANO.

THE INSTITUTION OF POST OFFICE ELECTRICAL ENGINEERS: BOOTH-BAUDOT AWARD.

THE Council wishes to call attention to the "Booth-Baudot Award" of £5 which is now offered annually for the best improvement in Telegraph, Telephone or Wireless Apparatus or Systems. The award for the year 1928 is governed by the following conditions:—

1. The Award will be restricted to employees of the British Post Office.

2. Applications for the Award should be made between Jan. 1 and March 31, 1929, and such applications should refer to improvements made, or suggested, during the twelve months ending 31st December, 1928.

Attention is drawn to the fact that recipients of Awards *via* the Post Office Awards Scheme in respect to any improvement in telegraph, telephone or wireless apparatus or systems are eligible to apply for the Booth-Baudot Award in respect thereto.

3. The Award may be withheld at the discretion of the Council of the Institution of Post Office Electrical Engineers if, after full consideration of the applications received, the adjudicators appointed by the Council are of the opinion that no award is warranted.

4. Applications for the Award, accompanied by full details of the improvement, should be addressed to the Secretary, The Institution of Post Office Electrical Engineers, G.P.O. (Alder House), London, E.C.1.

R. V. HANSFORD,
Secretary.

December, 1928.

TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—Short-wave wireless messages from the Sydney (Australia) broadcasting station were recently clearly received at Berlin on a wavelength of 29 metres between 5 and 6 o'clock.

The number of paid words handled by the Post Office beam service in both directions between this country and Australia averages between 180,000 and 200,000 a week, about 17,000 paid words have been transmitted from Australia by the beam service and about 10,000 by the Post Office Imperial cables in connexion with the first cricket test match.

AUSTRIA.—" Radio-Austria " has inaugurated a direct radio-telegraph service to Egypt on Dec. 1.

Massage and Radio !—In a Bill shortly to be brought before the Austrian Parliament there will be clauses making punishable the use of high-frequency apparatus for massage or other purposes in such a way that the reception of radio broadcasting is interfered with.

BOLIVIA.—*The Electrical Review* reports that the South American Republic of Bolivia, with a population of 2,599,000, has now 7,150 miles of telegraph wires and 3,589 miles of telephone wires in operation.

CHILI.—From Santiago, through Reuter's Trade Service, we learn that a powerful wireless telegraph station, just completed at Quilicura, 30 kilometres from Santiago-de-Chile, will be able to communicate with the whole world. The station belongs to the Compania Chilena Transradio.

CHINA.—Reuter's Shanghai agency cabled to the *Daily Telegraph* on Nov. 10 to the effect that a wireless traffic agreement was signed by Chang Chin-Kiang, Chairman of the National Reconstruction Council, representing the Nationalist Government, and Mr. Tyrrell, on behalf of the Radio Corporation of America, on Nov. 10. The preamble of the agreement states that the council contemplates the early erection of a station at Shanghai, for commercial communication with the Radio Corporation's stations in America. Both parties desire to operate direct a radio circuit between the United States and China for the purpose of furnishing a manual high-speed automatic duplex commercial service. Practically an identical agreement (within their respective spheres) was also signed by Chang Chin-Kiang and Herr Kohen, representing the " Transradio," of Berlin.

DUTCH EAST INDIES.—A Bill has been introduced in the Dutch Parliament, says Reuter, from Amsterdam, for extending various items in the Dutch East Indian Budget for 1928. One of the principal clauses consists of an increased credit of 330,000 florins (£27,500) for the Post and Telegraph Department to cover expenditure in the East Indies, including 75,000 florins (£6,250) as the first instalment towards the cost of erecting a powerful short-wave transmitter with a capacity of 600 kw., which will permit of five direct wireless telegraph connexions with Europe and simultaneously two or three wireless telephone connexions during a period of from eight to ten hours per day. The estimated total cost of the new installation, which it is hoped to complete by January, 1930, will be 980,000 florins (over £80,000). It is also proposed to erect installations for short-wave traffic with America, for which in 1929 a further expenditure of 300,000 florins (£25,000) will be necessary.

The Nederlandsche Kabelfabriek Maatschappij, of The Hague, is increasing its capital from 2½ to 5 million guilders (from approximately £208,300 to £416,600).

EAST AFRICA.—It is recorded by *The Electrical Review* that on Nov. 11 short-wave transmissions from (7LO) Nairobi were inaugurated. The short-wave transmitter operates on a wavelength of 33.5 metres, using a power of 2 kw., and the programme broadcast daily from 4 p.m. to 7 p.m. G.M.T. on the long wave of 400 metres will be simultaneously transmitted on the short wave.

FRANCE.—It will be noted that while picture telegraphy is making some headway, television is not yet well to the fore. Thus *World Radio* says that tests of picture transmission on the Bélin system are being carried out by Radio-Toulouse broadcasting station. From January, 1929, a picture service will be linked with broadcast opera, for the station intends to transmit photographs of the artists taking part in operas relayed from the Theatre du Capitole, i.e., not *moving* figures.

The Electrical Review is our informant that a merger of the radio and transatlantic submarine telegraph services is reported to be impending in France somewhat on the lines of the merger proposed to be carried into effect in Great Britain. Radio France, which controls radio communication with Britain, Austria, Spain, Rumania, Norway, Yugo-Slavia, and Czecho-Slovakia, and is attempting to establish communication with the United States through the Saint Assisi station, is reported to be negotiating an agreement with the French Cable Company, which controls the cables to the United States via the Azores. The proposed merger is regarded as the reply of France to the British proposals and the extensive schemes in the United States for the concentration of radio and cable communication under one control.

An alleged ingenious use of a secret wireless installation to assist them in exchange speculations has led to the prosecution before the Twelfth Correctional Chamber of four foreign financiers and two French operators.

It is asserted that during the summer of 1926, when the franc reached its lowest ebb, two Exchange agents had a secret wireless transmission set installed in a private house. They also had a special telephone line connecting directly with an Exchange agent operating on the Bourse. They were thus able to inform their correspondents in Berlin and Vienna of the exchange rates of pounds sterling and dollars in Paris several minutes before the news reached foreign Bourses by ordinary means of communication.

This small advance was so important that it enabled the two financiers and their associates to conduct large operations with the least risk of loss. The charge against the accused is one of illegal competition with the State monopoly of posts and telegraphs.

Later the Central News reports that one at least of those accused of having set up a clandestine wireless transmitting station for use in connexion with speculation in francs, has been found guilty.

He has been sentenced to one year's imprisonment and a fine of 5,000 francs.

GERMANY.—Another example of picture transmission is to be found in the fact that the Königswusterhausen broadcast telephony station made its first experimental transmissions of pictures on the Fulton system on Nov. 20, from 9.45 to 10.15 p.m. G.M.T. Subsequent transmissions are to be made at the following times: Sunday, 12.45-1.30 p.m.; Monday, Wednesday, Thursday and Saturday, 12.45-1.15 p.m.; and Tuesday and Friday, 9.45-10.15 p.m. G.M.T.

GREAT BRITAIN.—*Middlesbrough.*—Apparently the announcement made about the middle of November by one of the wireless periodicals was not exactly correct when it said that the Corporation Electricity Department was manufacturing radio-receiver battery eliminators for sale to its consumers on the instalment system. The fact is that, although they have been designed under the direction of the Corporation, the outfits are being supplied by a well-known manufacturer of wireless and electrical apparatus and are being purchased by the Corporation.

The British Broadcasting Corporation announced some two months ago that during November and December ten relay stations would take over the national exclusive frequency of 1,040 kilocycles (288.5 metres). The necessity, however, of installing elaborate apparatus has led to the postponement of the scheme, and it is now announced by *The Times* that it will not come into operation until the early spring. Later news says during the current month.

Radio Beacons.—The installation of wireless beacon stations round the coasts of the British Isles is proceeding rapidly. The Marconi Company has already erected six stations, which are now in use, and seven more have been ordered. Among those now in operation, the Mersey Bar, Coningbeg and Spurn stations are on lightships, while those at the Skerries, Round Island and the Casquets are on land. The next seven stations to be erected, for which apparatus is now being constructed, are at Start Point, Lundy Island, Sule Skerry, Dungeness, South Bishop, Kinnaird Head and Cromer; beacon transmitters are projected also for Tory Island and Mizen Head. By the provision of submarine signalling apparatus in conjunction with a wireless transmitter, simultaneous signals can be transmitted in two different media; this system is used at the Spurn and Coningbeg light vessels. Since the speed of propagation of wireless signals is practically instantaneous, while that of submarine signals is approximately 0.8 sea mile per second, the two signals are heard at different moments, the time elapsing between the receipt of the wireless and submarine signals being a measure of the observer's distance from the transmitting station. In order to facilitate reception of wireless and submarine signals one side of the head telephone receivers is connected to the wireless receiver and the other to the submarine signal receiver. The use of a direction finder also enables a determination of position to be made with the aid of a single signalling station.

Special to Wireless Operators.—The Merchant Shipping (Wireless Telegraphy) Rules Amendment Rules (No. 2), 1928, dated Nov. 15, 1928, made by the Board of Trade under the Merchant Shipping (Wireless Telegraphy) Act, 1919 (9 and 10 Geo. 5, c. 38), which comes into force on Jan. 1, 1929, provides that the following shall be substituted for paragraph (*a*) of Rule 15 of the Merchant Shipping (Wireless Telegraphy) Rules, 1927 (*a*), viz.: " (*a*) A first-grade operator is one who holds the Postmaster-General's first-class certificate of proficiency issued under the provisions of the International Radio-telegraph Convention (London), 1912, or the Postmaster-General's first- or second-class certificate of proficiency issued under the provisions of the International Radiotelegraph Convention (Washington), 1927, and who has had three years' experience as an operator at sea, of which period two years shall have been in a ship where fixed hours of watch are kept."

Marconi's Wireless Telegraph Co., Ltd., says the *Electrician*, announces that the beam wireless stations successfully withstood the test of the heavy November gales. The safety devices included in the design of the aerial system have worked perfectly, and where interruption in the services has taken place it has been due to interruptions in land-lines, the stations being able to communicate between themselves throughout the gale. This, we understand, continues the *Electrician*, was rendered possible by the special design of the aerial wires at the beam stations, which, normally tightly strained, are so arranged that when the wind reaches hurricane force and undue strain is placed on the masts the tension of the wires is automatically reduced at the lower end. This is of course quite apart from fading period effects.

A propos of this matter *The Electrical Review* directs attention to a letter written by the Postmaster-General to *The Times* on this subject, as follows: "Your leading article . . . does less than justice to the standard of pole line construction adopted by the Post Office . . . reports of the engineers show that the damage caused by the direct effect of wind pressure upon poles and wires was practically nil. In almost every case in this country the interruption was due to damage either by falling trees, or occasionally by dismantled roofs and broken chimneys, and in the case of the French circuits to a subsidence in a French road, which broke the underground cable."

Statistics published in the current *Wireless Trader* show that during September radio apparatus valued at £80,870 (valves £12,834) was exported from this country. Australia took £12,248, including valves £3,121. Italy £11,059 (valves £18), Sweden £8,860 (valves £1,152), the Netherlands £7,678 (valves £182), the United States £2,968 (valves £1,032), France £2,553 (valves £192), Argentine £2,483 (valves £7) and Jugo-Slavia £2,186.

Rochdale.—Wireless receiving and transmitting sets have been installed on the Rochdale fire engines. Various tests have all been successful, and constant communication with headquarters has been maintained from all parts of the town while travelling at high speeds.

Westminster.—The General Purposes Committee of the Westminster City Council have taken up the matter regarding nuisances caused by the installation of wireless loudspeakers. The nuisance arising from the use of such instruments in private houses, in the opinion of the Home Secretary, was not one which could be made the subject of a by-law. The committee recommends the framing of a by-law similar to that already sanctioned for East Ham, which entails a maximum penalty of £5.

Parliamentary Questions, Replies, &c.—On Nov. 13 Mr. Malone asked the Postmaster-General whether his department had considered the position of television; whether he considered it was necessary to revise the present Wireless Telegraphy Acts; and whether, if the Royal Charter granted to the British Broadcasting Company did not include the transmission of photographs by such methods as the Fultograph process, any application had been received to increase the scope of the power of the British Broadcasting Company to include television.

Lord Wolmer, who replied, said that he did not consider it necessary to revise the Wireless Telegraph Acts or the Royal Charter of the British Broadcasting Corporation. The question whether any modification was desirable in the terms of the Corporation's licence was at present under consideration.

On the same date Sir William Mitchell-Thomson informed Mr. Day that the number of wireless receiving licences in force on Oct. 31 last was about 2,543,000. [The number on Nov. 30 was 2,578,000 approx.]

On Nov. 19, Mr. Pilcher asked the Postmaster-General if he would state the capital cost of the four beam transmission stations erected, respectively, for the Australian, Canadian, Indian and South African services.

Viscount Wolmer said that the total cost of the four beam stations was approximately £242,200.

Replying to a further question by Mr. *Pilcher*, Viscount Wolmer said that on the Australian service during the first 52 weeks of its operation 7,306,000 words were handled; on the Canadian service 4,591,000; on the Indian service 10,078,000; and on the South African service 8,375,000. During the first complete week of operation of each service, the number of paid words handled was 53,000, 59,000, 115,000 and 88,000, respectively. During the week ended Nov. 11, 1928, the respective totals were 181,000, 113,000, 253,000 and 200,000.

Replying to an inquiry regarding external beam wireless telegraph services operated from this country in addition to the four Imperial services worked by the Post Office, the Postmaster-General stated that beam services are operated from this country by the Marconi Co. to the Argentine, Brazil, the United States and Egypt. The first two of these came into operation on Aug. 5, 1927; the United States service on Oct. 28, 1927, and the Egyptian service on Jan. 15, 1928. The transmitting station in this country for all four services is at Dorchester and the receiving station at Somerton (Somerset).

The Postmaster-General also announces instructions for official redirection of fully addressed telegrams, due to a change of address, are now recorded free of charge for three months (and for a fee of £1 1*s*. per annum if continued beyond three months), unless redirection involves transmission of the telegram to another town or other additional service, in which case the telegraph charges at present applicable will continue to be payable.

The Institution of Electrical Engineers.—Wheatstone and Volta.—At its ordinary meeting on Dec. 6, Sir George Sutton, Bt., presented to the Institution an oil painting of Wheatstone, by Sir William Llewellyn, K.C.V.O., R.A., and Mr. R. W. Paul presented an oil portrait of Volta, painted by Signor G Palanti, of Milan, both of which have been hung in the lecture theatre. Lieut.-Col. K. Edgcumbe, T.D., R.E.T. (Ret.), President, accepted the gifts on behalf of the I.E.E. Council.

GREECE.—According to the recently issued official report for 1926 there were 11,600 miles of telegraph lines in operation in Greece at the end of that year, 1,843 miles running along the railways and the remainder along the roads. The lines represented a total length of wire of 29,968 miles.

IRISH FREE STATE.—The imports of electrical goods, excluding machinery, into the Irish Free State during October last amounted to £72,062, bringing up the total for the first ten months of the year to £410,003, as compared with £310,470 in the corresponding period of 1927.

The Post Office authorities, says *The Electrical Review*, are taking steps to establish a wireless-telegraph station at Fleetwood to operate when communication by means of submarine cable either with the Isle of Man, or Ireland, is interrupted.

ITALY.—A new broadcasting station, of 50 kw., is to be erected in Rome and is to be ready by Oct. 28, 1929, says *The Electrical Review*. *The Times* adds that it is proposed to erect by the same date a short-wave station for transmitting Italian programmes to America and the Italian colonies.

JUGO SLAVIA.—The Exchange agency at Berlin reports the completion of the new Jugo Slavian broadcasting station near Laibach. Wavelength *566, call, that of the cuckoo, so it is said!*

NATAL.—A court of inquiry at East London into the foundering of the *Cariboo*, which was sunk off the Natal coast, declared that no blame attached to the captain or officers, but recommended that the authorities should take steps to improve the wireless facilities at East London.

Reuter's Trade Service at Lima states that the new wireless station (OAX) opened near Tumbes (Provincia Litoral), Peru, bordering on Ecuador, is the 15th to be erected in the Republic; it forms part of the Government communication system and compares in power with the stations at Lima and Collao, which have a range of about 1,000 miles. A receiving wavelength of 600 metres is used with transmission waves of 600, 1,500, 3,000, 3,500, and 4,000 metres.

SWEDEN.—About Christmas time the Malmö station will be replaced by a new one at Hörby in Skane, having a power of 20 kw.

SWITZERLAND.—Reuter's Geneva correspondent advises that the recent trials of wireless communication undertaken by the Secretariat of the League of Nations with different parts of the world were carried out on short waves, and, in reply, 92 reports have been received by the Secretariat classified as follows: in seven cases reception was bad; in 18 cases it was fair; in 29 cases reception was good, and excellent in 38 cases. In view of the success obtained, the Secretariat has decided to continue the trials. An effort will be made to reach more particularly the American Continent, north and south, Japan, Australia and New Zealand.

The short-wave station of the Netherlands Government at Kootwijk will be used, says *The Times*; it will be coupled to a small studio at the Palais des Nations in Geneva by means of a telephone cable circuit between Switzerland and Holland. The reports on the previous experiments in which Kootwijk took part suggest that the wavelength then employed (18.4 metres) was particularly suited for reception in the Netherlands East Indies, South Africa, East Africa, and the southern part of the Indian Ocean.

U.S.A.—According to *World Radio*, Mr. C. P. Edwards, Canadian Director of Radio, has been informed by Mr. O. H. Caldwell, of the Federal Radio Commission, that under the new allocation system, which came into effect on Nov. 11, "no station in the United States on a channel shared with Canada exceeds 500 watts power," and that "no station within approximately 250 miles of the border is using more than 250 watts." On United States-shared channels the Commission has established a policy of granting three times the night power for use during daytime until sundown.

Wave-control.—An automatic device is to be used by the Federal Radio Commission, says Reuter's New York Agency, to keep broadcasting stations in their assigned channels. Mr. Arthur Batcheller, Federal Radio Supervisor for New York, says that "secondary standards" are to be installed in the sub-treasury at New York and in the Custom House at Boston, which will show visually when a broadcasting station is deviating from its allotted wavelength and the extent of deviation; only 500 cycles of variation is permitted.

Broadcasting Without the Ether!—An interesting transaction is recorded in the technical press foreshadowing the lines on which broadcast radio-telephony in the United States is expected to develop: by a deal involving a large transfer of patents the North American Company, one of the largest suppliers of electric light and power in the United States, has granted the Kolster Radio Corporation title to no less than 600 of its patents, in return for exclusive licences in the field of wired-radio to one of its subsidiaries, Wired Radio Inc. The patents concerned include the fundamental patent for "chain broadcasting," as well as patents for television and talking motion pictures. The significance of the transaction is the fact that within the coming decade most of the broadcasting in the United States will, it is predicted, be carried on over household electric light and power wires, the air being left clear for commercial and safety communications; in this way the worst of broadcasting difficulties will be overcome. The Kolster Radio Corporation has also received from the North American Co. a contract to manufacture for Wired Radio Inc. not less than one-third of its apparatus requirements, the value of the business which it will receive in this way being estimated at approximately £7,200,000 per annum. The North American Co. is already fully equipped to enter the wired-radio field.

One cannot be certain that the following is actually television as understood this side of the Atlantic. A committee appointed by the Radio Manufacturers' Association of the United States has recommended that all "radiovision" pictures at present being broadcast be standardised, so

that one receiver with one scanning disc will be able to receive any of them. The committee's standard is the system used by Mr. C. F. Jenkins in Washington. The method recommended uses 48 lines with 15 separate pictures (frames) every second. *The pictures, therefore, will not show much detail, being decidedly inferior in this respect to the pictures which Mr. J. L. Baird can broadcast from his laboratory, says* "Nature." It is expected that all the television broadcast stations in the United States will adopt this standard. [The italics are ours.—ED., *T. & T. Jnl.*]

General and Personal.—Private Companies.—The gross income of the Radio Corporation of America and its subsidiaries during the quarter ended Sept. 30 was $23,643,332, and the surplus profit $5,221,146, making the surplus profit for the first nine months of this year $9,745,924.

A quarterly dividend of 5*s.* (net) per share has been declared by the Globe Telegraph & Trust Co., Ltd., on the ordinary shares.

The Western Telegraph Co., Ltd., has also declared a dividend of 5*s.* per share free of tax in respect of the quarter ended Sept. 30 last.

The Marconi Royalties Appeal.—In the Chancery Division, on Nov. 20, Mr. Justice Tomlin was asked to fix a date for the hearing of the appeal of Marconi's Wireless Telegraph Co., Ltd., against the recent decision of the Comptroller-General of Patents. His Lordship said that his list included a number of lengthy actions taking precedence of appeals which would probably occupy the remainder of the term. In the circumstances he was unable to fix a date, but if one of the prior actions was settled a further application could be made.

For Our Advertisers.—Contracts Open.—Where not otherwise indicated, quote reference and apply Department of Overseas Trade, London, S.W.

Australia, Melbourne, Jan. 15. Department of Posts and Telegraphs. Telephone transformers (B.X. 4878); coil posts (B.X. 4879). Jan. 22—Telephonists' telephones (B.X. 4888); telephone transmitters and parts (B.X. 4889); telephone receivers and parts (B.X. 4890). Jan. 29—Accumulator batteries and counter E.M.F. cells (schedule C. 390) (B.X. 4906).

New Zealand, Wellington, Jan. 15. Posts and Telegraph Department. Telephone cords. (B.X. 4847). Feb. 12—Supply of V.I.R. wire D.O.T. Feb. 19—Supply of bronze wire and copper wire and of 120,000 galvanised steel spindles for insulators (D.O.T.).

South Africa, Pretoria, Jan. 24. Posts and Telegraph Department. Telephone switchboards (B.X. 4912).

India.—Stores Department, New Delhi, Feb. 5. Supply of turbo-alternator, boiler, economiser, switchgear and cables (B.X. 4944).

Promotions in the C.T.O.—Sincerest congratulations to Mr. Hunt upon his appointment to Asst. Supt., Inland, after his successful association with the Imperial Cables.

Also, in the Cable Room, to Mr. Rennie, who obtains a Provisional Overseership, and to Mr. A. E. H. Skinner, upon receiving the same qualified advance in the Service. Later on it is earnestly hoped the ratifications will follow.

Likewise to Mr. P. Nockles, whose "provisional" has been made "substantive."

With the closing of the year there passed away the much-respected Mr. A. J. O'Donnell, Overseer in the Inland Department of the C.T.O., the victim of a malignant disease. A most capable officer, and modest withal, Mr. O'Donnell formed one of a small band of Inland telegraphists who in the early days of the war, volunteered to journey to an unknown destination "Somewhere in Russia," and who, as a sequel, disappeared for many weeks then suddenly came through to the C.T.O. by a long and circuitous circuit of submarine cable and land lines, from the not too hospitable coast of Murmansk.

It was specially sad that practically on the eve of his 60th year there should pass out of our sight so faithful a friend and colleague. To his sorrowing relatives are offered the sincerest expressions of sympathy.

We have received a very useful tear-off calendar from Messrs. Siemens & Schuckert, and as usual the monthly issue, tastily presented, coloured calendar from Messrs. Creed & Co., old friends of the Telegraph Service.

The 1928 Christmas card from the F Division, as representing the C.T.O., London, has this season struck out a new line in its issue under the aegis, as usual, of Messrs. Johnson & Young, of *The Lost Office Circular.*" This is easily a happy skit on the official weekly publication with which all Post Office servants are familiar. Printed on superfine paper, with a two-colour front page, this "Christmas number" of eight pages is a credit to the printers, Messrs. Baines & Scarsbrook, who have well entered into the spirit behind the production, which one may truthfully say is one of "naught set down in malice."

I understand that the whole issue of five hundred copies has been disposed of and there is still a cry for more.

One cannot better close these New Year notes than by quoting one of the author's quotations from a prayer of R. L. Stevenson :—

> "The day returns and brings us the petty round of irritating concerns and duties. Help us to perform them with laughter and kind faces."

J. J. T.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Oct. 31, 1928, was 1,696,205, an increase of 8,930 on the total at the end of the previous month.

The growth for the month is summarised below :—

Telephone Stations—	*London.*	*Provinces.*
Total at Oct. 31	603,046	1,093,159
Net increase for month	4,043	4,887
Residence Rate Subscribers—		
Total	141,645	224,670
Net increase	1,456	1,936
Call Office Stations (including Kiosks)—		
Total	5,450	19,800
Net increase	21	139
Kiosks—		
Total	1,158	4,632
Net increase	39	133
Rural Party Line Stations—		
Total	—	10,293
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	—	1,009
Net increase	—	26

The total number of inland trunk calls dealt with during August, 1928 (the latest statistics available) was 9,217,489, representing an increase of 698,833, or 8.2% on the figure for the corresponding month of the previous year.

Outgoing international calls in August numbered 32,972 and incoming international calls 37,210, representing increases of 8,398 (34.2%) and 10,569 (39.7%) respectively, over August, 1927.

Further progress was made during the month of November with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Monument and Mansion House (automatic),

PROVINCES—Bearwood, Bromborough,

and among the more important exchanges extended were :—

LONDON—Sydenham, Wembley, Wimbledon.

PROVINCES—Bilston, Crosby, High Wycombe, Idle, Openshaw, Paisley (automatic), Shettleston, Stansbridge.

During the month 78 new overhead trunk circuits were completed, and 84 additional circuits were provided by means of spare wires in underground cables.

A RESPONSE TO A CALL FOR "HELP!"

OUR correspondent, Mr. H. MORGAN, of the London Telephone Service, reports that, as a result of the article entitled "Help!" which appeared in the September issue of the *Journal*, two Field Officers on development work have tried their hand at canvassing work with conspicuous success. When examining "distribution areas" they have from time to time mentioned the advantages of the service to potential subscribers. During October and November these two officers in the course of their ordinary work obtained actual orders for 16 business-rate lines, 1 residence-rate line and 6 extension lines, besides promises from some 9 people to join the telephone system at once, and another dozen promises to consider the question in a few weeks' time. We consider this a remarkable effort for "amateur" contract officers, and also evidence that the *Journal* has an influence which is not always fully appreciated.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 60.)

1874, Oct. 19... Granfeld, of Vienna, applied the Hughes correction to Meyer's telegraph distributor.

Willot, of France, replaced Meyer's recorders by ordinary ink-writers.

Elisha Gray experimented with the transmission of sounds, introducing an induction coil into his apparatus.

Alexander Graham Bell assisted by Charles Sumner Tainter, constructed an apparatus for transmitting sounds by utilising luminous rays and selenium.

Thomas Alva Edison devised a method of quadruplex telegraph working.

W. Clauson-Thue published the *A.B.C. Universal Commercial Electric Telegraphic Code.*

1875, Jan. ... Baronio invented the "Stenocode" for the purpose of increasing the traffic capacity of long cables.

1875, Feb. 23 Elisha Gray, of Chicago, filed a specification of an invention for transmitting musical sounds.

1875, Feb. 25 Alexander Graham Bell, of Salem, Massachusetts, filed an application for a patent for two methods of producing intermittent currents.

1875, April 6 Bell patented an apparatus for transmitting two or more telegraphic signals simultaneously.

1875, June ... Bell's telephone invented. Thomas Augustus Watson assisted Bell in his experiments with the telephone. Charles Williams, of Boston, Mass., manufacturer of telegraph and electrical apparatus, constructed models under Bell's direction.

1875, June ... French Government accepted Baudot's invention and carried out trials.

1875, July 1 ... International Postal Union came into operation.

1875, July 27 Elisha Gray granted a patent for an invention for transmitting musical sounds.

Committee appointed to inquire into the financial state of the British Telegraph Service.

1875, Sept. 21 Public demonstration of Bell's telephone at Brantford.

1875, Oct. 19 Sir Charles Wheatstone died.

International Telegraph Conference at St. Petersburg. Code and "Urgent" telegrams permitted.

Travelling Post Offices in Great Britain placed under the control of the Circulation Office (now the London Postal Service), with the exception of a few controlled by Surveyors.

1876, Jan. 1 ... France entered the International Postal Union.

Number of British registered letters reached 5,000,000.

1876, Feb. 14 Bell filed an application for a patent for an apparatus for transmitting vocal sounds. An hour or two afterwards Elisha Gray filed a specification of a similar invention.

1876, Mar. 7 ... Bell granted a patent for an apparatus for transmitting vocal sounds.

Sir Oliver Lodge maintained that a lightning flash was an electric oscillation rather than a current. He designed a lightning protector for submarine cables.

W. H. Preece and J. Sivewright published *Telegraphy.*

Bell Telephone Association formed in America.

Ruhmkorff invented a current reverser, or Commutator, and improved Mason's Induction coil.

Apps, Callan, Henley and Page devised various types of induction coils.

Paul Jablochkoff made a battery composed of plates of carbon and iron in fused nitre.

1876, June 25 Bell submitted his telephone to Sir William Thomson (Lord Kelvin).

Telephone transmitter and receiver exhibited by Bell in Philadelphia. At a meeting of the British Association in Glasgow, Sir William Thomson gave an account of the results obtained by Bell and exhibited the receiver.

Sir Oliver Lodge and Paalzow proved the theories of Riess and Henry relative to discharge of a Leyden jar.

Gerritt Smith introduced the polechanger and compound relay in quadruplex telegraphy.

William Slingo (afterwards Sir William Slingo) opened the Telegraphists' School of Science in Aldersgate Street, London. "Studying Slingo" has been for many years the London telegraphist's method of intimating that he has taken up a course of technical study.

1876, Dec. 9 ... Bell patented his telephone in England.

William Crookes invented a radiometer.

Special adhesive stamps issued for prepayment of telegram charges.

16,000,000 Money Orders issued.

1877, Mar. 3 ... R. S. Culley, Engineer-in-Chief to the Post Office, reported that he had not seen Bell's telephone.

John Christie published a *Manual of Telegraph Construction.*

Stores Department, Telegraphs, formed and Controller of Stores appointed.

(*To be continued.*)

CHRISTMAS GREETINGS BY TELEGRAPH.

IT was reported to us on Christmas Eve that up to noon on that day some 30,000 Christmas Greetings telegrams had been received and forwarded over the beams working to Australia, South Africa, India and Canada and over the Imperial Cables working with Canada and Australia. This work was still coming in freely, and the total Christmas Greetings traffic over these routes promised to reach between 40 and 50 thousand messages. In addition, a large volume of Greetings traffic was also being handed over to the Post Office to deal with from the various cable companies.

For the first time a Christmas and New Year's Greetings service has been arranged with a number of Continental countries, and the service is being fairly freely used.

A feature of this year's traffic is the large number of reciprocal greetings being passed between banks and business houses.

The Christmas and New Year's Greetings facilities are now world wide, extending from the remotest northerly parts of Canada to the smallest places in Australia, and embracing such isolated places as the Falkland Islands, Norfolk Island, Rodriguez—in fact, practically all parts of the world.

PRIZE-GIVING: GIRL PROBATIONERS (LONDON TELEPHONE SERVICE).

A DIGNIFIED and interesting little ceremony took place in the Conference Room at Cornwall House on the afternoon of Dec. 5.

The Conference Room sees varied scenes, none more heartening than this gathering of the youngest girl members of our great Service to receive the prizes earned by their work at the Baltic Street Continuation School. Mr. Valentine, after giving particulars as to the number of girls who had obtained appointments as telephonists, telegraphists and sorting assistants, distributed the prizes. As each prize-winner advanced Mr. Valentine read the report given her by the Principal of the School. He congratulated the girls on their good fortune in attending the School with such a Principal (Mr. Law). Mr. Valentine asked how many of them had noticed the number of stations now connected in the London Telephone Service which those who were observant would see at the Waterloo Road entrance. In speaking of the growth of the automatic service he impressed upon the girls that there was no truth in the rumour that no more telephonists would be required. On the contrary it had been estimated that during the next ten years there would be no diminution in the number of telephonists required and they could tell their friends that they might still obtain appointments as telephonists. The automatic working had taken away the simpler and less interesting duties of the telephonist. He wanted them all to realise the greatness of our service which had been made possible by a discovery some 50 years ago by Alexander Graham Bell and T. A. Watson. He told them he had recently met Mr. T. A. Watson, and went on to explain how the great discovery had been made.

After words of thanks to the Controller for his inspiring talk and a fine clapping of hands as an appreciation from the girls, proceedings closed.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch.

THE volume of business done by the Contract Branch during the month of November showed a distinct improvement on the corresponding month last year as indicated by a net increase of 6,064 stations this year, as compared with 5,019 last year.

Now and then we get amusing evidence of the ideas some individuals hold as to the duties of the Telephone Service. Recently, on keeping an appointment made on one of the advertising postcards, the Contract Officer found that the applicant had never had any idea of ordering a telephone, but wanted his wireless set overhauled and thought that his 10*s.* for a licence included maintenance ! !

Some people are still very reluctant to have telephones in their homes, and contract officers must come across many amusing reasons for refusals. One man recently would not listen to any argument and refused all the advantages of service, because he considered it would be conducive to his wife taking less exercise than she ought to ! ! !

The London Telephonists' Society.

On Friday, Nov. 23, 1928, the third meeting of the current session of the London Telephonists' Society was held in the Lecture Hall of the City of London Y.M.C.A., 186, Aldersgate Street, E.C.4.

Tea was served in the ante-room for half-an-hour prior to the meeting, when members from various exchanges and offices had the opportunity of exchanging news and views with their colleagues.

The subject chosen for the meeting was a lecture, entitled "The Early Development of Telephone Switching." The lecturer, Captain F. G. C. Baldwin, who had very kindly travelled from Newcastle-on-Tyne in order to speak before the Society, is not only a great authority on the subject, he is an extremely able and interesting lecturer, who was able to completely hold the attention of an audience almost wholly non-technical. Capt. Baldwin illustrated his lecture with lantern slides of great interest; which made one more acutely realise the tremendous speed with which telephony has developed; and it was obvious that the ladies present also appreciated the opportunity they thus received of comparing the clothes of to-day with the voluminous drapery of nearly half a century ago.

At the conclusion of the lecture, the Controller, in proposing a vote of thanks to Captain Baldwin, expressed the feelings of all who were present.

On Saturday, Jan. 26, 1929, the Annual Supper and Dance of the London Telephonists' Society will be held at the Bishopsgate Institute, E.C. This event is always most popular, and as the number of tickets issued is strictly limited, an early application should be made to the Hon. Secretary, Miss E. McAllister, Regent Exchange, 32/3, Gerrard Street, Soho, W.1.

National Sanatorium—Benenden.

The first Concert, organised by the L.T.S. Staff, for this Season, was held on Saturday, Dec. 1, at the Sanatorium. The artistes were Misses Pidgeon, Logan, Dean, and Worth, and Messrs. Conyers, Harris, and Hugh Williams. The Concert was under the direction of Miss Worth, who, in addition to arranging these functions, works so strenuously for all that appertains to the "San." Patients, Staff, and Artistes all appeared to enjoy the evening; indeed, one poor fellow laughed so heartily at the humorous numbers of Charles Conyers and John Harris that he collapsed, and had to be carried out. During the interval cigarettes, chocolates, &c. were handed round to the patients by the Artistes on behalf of the L.T.S. Staff.

The Matron provided the party with tea and supper, and before leaving, the opportunity was taken of expressing the appreciation of the Artistes for the warm reception and hospitality received.

Many enquiries were made as to when the L.T.S. would be providing another Concert, and assurances were given that, thanks to the generosity of office and exchange colleagues, there would be several others during the Season.

Football.

The L.T.S. football club is now in its second season in the Civil Service League, 2nd Division, and its record for a new club would generally be regarded as satisfactory, but if promotion to the 1st Division is to be won, it is worth while taking stock of the players and enquiring whether the team is good enough for the job.

I believe it is, but like many junior clubs, results could be improved upon if the team would pay more attention to a study of the game and its movements.

Allowing for the limitations in junior football of ball manipulation, I have been impressed at various times by the absence of resource and understanding on the part of some of our players.

We hear a lot about the W formation adopted in higher grade football as a consequence of the alteration in the offside law, but I don't think we need pay much attention to that here. What one would like to see is the unexpected cross pass from an inside position to the opposite wing man which so often catches the opposing defence out of position. Our wing half-backs should cultivate lobbing the ball over the heads of the defending half and full back, and the wing man should be ready for this move; a throw in is often better utilised by dropping the ball to the feet of one of your own side, the half being ready for a quick return pass. I have seen goals sacrificed which could probably have been saved if the back pass to the goalkeeper had been exploited. I believe in the defence playing on top of the opposing forwards on the side of the field where play is proceeding, and falling back as the ball is worked across to the opposite wing. But perhaps the biggest mistake by some of our less experienced defenders is a tendency to back on their own goal before an attack of the opposing forwards. A properly judged move towards the man in possession of the ball has the two-fold advantage of (1) securing the ball by an effective tackle or (2) throwing your opponents offside if a pass is attempted.

It is also helpful, when in possession of the ball, to know the position of your opponents, and a colleague should not hesitate to offer a word of advice by calling out "man behind you," or "plenty on time," &c., &c. Passes are often made too hurriedly when considerable advantage could be gained by first "drawing" a man. A successful team generally owes more to "head work" than to footwork and speed.

The results of the last three matches have been as follows:—

v. War Office	Won, 4—1
v. Holloway Stores	Lost, 0—2
v. Ministry of Health	Lost, 1—3

Bowls.

A meeting of the London area committee of the Civil Service Bowls Association took place at Treasury Chambers on Wednesday, Dec. 12, 1928, and important business was transacted, which is of considerable interest to all bowling enthusiasts and particularly to the London Telephone Service bowls enthusiasts, whose representatives hold the London Area Rink Championship.

A resolution was carried that all the Service Clubs be organised in two divisions, the stronger clubs forming the 1st division and the rest the 2nd division. The two top clubs in the 2nd division will be promoted annually to the 1st division, and the two bottom clubs in the 1st division will descend to the 2nd division. To maintain the competition between Post Office clubs for the Bunbury Cup, all league matches between Post Office Clubs will count for this purpose, additional games being arranged where necessary between Post Office clubs not in the same division.

The initial distribution of the clubs between the two divisions will be performed by the Committee.

Another important recommendation adopted by the meeting is the formation of a "London Civil Service Bowling Club," which will affiliate to the Middlesex County Bowling Association.

One important effect of this will be that all departmental clubs will be affiliated through this newly formed body to the County Association, and individual members will be eligible to compete in a wide variety of events hitherto debarred to them. This departure, however, will raise many other interesting questions which no doubt will be the subject of criticism at the various service clubs meetings.

Much attention has been directed to the state of the Headquarters green during the winter, and it is expected that the conditions at Chiswick will be vastly improved in time for the commencement of the 1929 season.

Netball Competition.

The first round in the competition for the "Liddiard" Shield has been completed with the following results:—

Clerkenwell beat Riverside	44—3
Central beat Kensington (2nd)	22—5
Thornton Heath beat Chiswick	19—14
Holborn (2nd) beat Maryland	8—7
Controller's Office beat Kensington ...	29—7
Rodney beat Ealing	21—7
Holborn Western	14—8
Controller's Office (2nd), w.o. Rodney (2nd) Scr.	

The draw for the second round is:—

Clerkenwell versus Holborn.
Central versus Thornton Heath.
Holborn (2nd) versus Controller's Office (2nd).
Controller's Office versus Rodney.

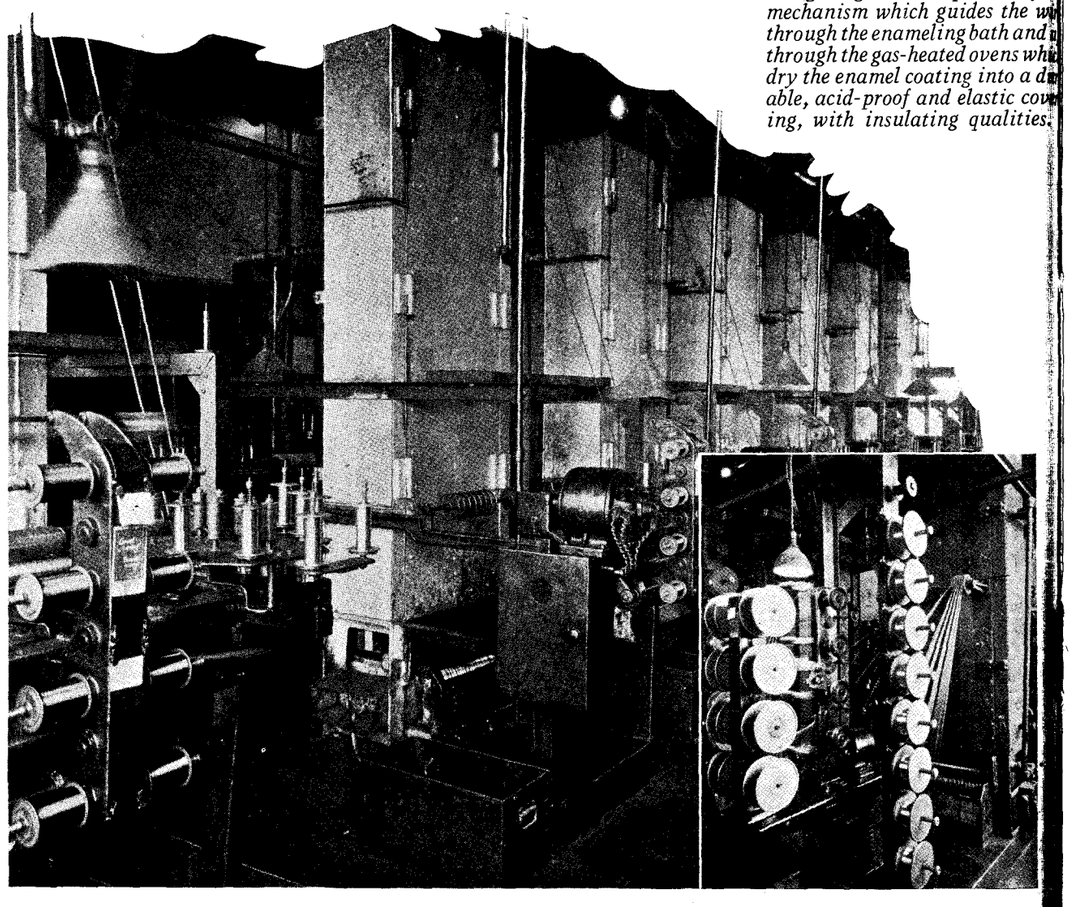
Obituary.

The L.T.S., particularly the Traffic Branch, has sustained a grievous loss through the death of Mr. Frank Hooper, following upon a short illness. Mr. Hooper commenced his career with the National Telephone Company on the engineering side, being for many years on the maintenance side at Battersea. He transferred to the Traffic Staff a year or so prior to the transfer of the N.T.C. to the Post Office, and at that time was an Exchange Manager. In this capacity, and later as Assist. Superintendent of Traffic, he was from time to time in charge of different exchanges, notably Paddington, City, and lastly London Wall and Clerkenwell Exchanges.

He was extremely popular with the staffs under his control, and with his colleagues, and will be long remembered for his loyalty, fairmindedness, and kindness, amongst his many excellent virtues. In addition to his work in the Civil Service he played his part in sterner affairs, serving with the Cavalry in the South African War and in the Royal Flying Corps in the Great War.

Maintaining Strowger Automatic Supremacy—

By Means of Special Wire Enameling Processes.



The illustration shows a row of enameling machines, with an insert giving a close-up view of the mechanism which guides the wire through the enameling bath and through the gas-heated ovens which dry the enamel coating into a durable, acid-proof and elastic covering, with insulating qualities.

AUTOMATIC Electric Inc. was one of the first telephone equipment manufacturing companies to develop a satisfactory enamel coating for wire, and for more than twenty years has enameled its own wire in its own factories by means of its own specially developed processes. All copper wire used is held to the highest standards of purity, and every component ingredient of the enameling mixture must pass the most exacting tests for quality and purity before being accepted for use.

This is but one of the many means which Automatic Electric Inc. utilizes to ensure the excellency of its product. When it is found impossible to obtain a particular part or a particular material which meets the rigid requirements necessary to Strowger Automatic quality, arrangements are made to manufacture that part or produce that material in its own factories in order definitely to insure high quality. The users of Strowger Automatic telephone equipment for the past thirty years will bear enthusiastic testimony as to the practical value of this policy to the Company's customers.

[*This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.*]

Automatic Electric Inc.

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STROWGER AUTOMATIC

The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. JANUARY, 1929. No. 166.

THE TELEGRAPHS AGAIN.

WE are assured on all hands that the British telegraph service is in a bad way. The physicians cluster round the bedside and prescribe various medicines, usually very nasty. From time to time specialists are called in; they all find grave symptoms of disorder, but they cannot agree as to the best course of treatment; some advise a major operation, others doubt whether the patient's health will stand it.

Meanwhile, what does the patient think about it all? At times, perhaps, he thinks he is very ill, because so many eminent persons have told him so; at times he may suspect that the only thing that is wrong with him is the effect of the many medicines that he has had to swallow, and that if only people would let him alone, he would soon be on his feet again. But it is hard to find out what the patient thinks; for the British telegraph service has few opportunities of expressing its own point of view. Least of all are such opportunities normally given to those who are in the closest contact with the practical details of telegraph working.

In order to give a chance for "the man on the job" to express his views, we are arranging in this *Journal* for a series of articles, of which the first will appear in our February number. The title of the articles is "How to Improve the Telegraph Service." The contributors will remain anonymous (except for a general description); but we have spread our net fairly widely, and have succeeded in catching a Superintendent and a Sorting Clerk and Telegraphist in the Provinces (a hateful word, but difficult to avoid!); an Overseer and a Telegraphist in the Central Telegraph Office; an Engineer, a Traffic Officer, and a provincial representative of the Imperial Cable and Wireless services. Most of them have never contributed to the *Journal* before.

The articles will appear monthly, but the later articles will not be in any sense criticisms or elaborations of the earlier articles. They will be received here more or less simultaneously (at least, we hope so) about the middle of this month; and no contributor before writing his article will have seen what any other contributor has written. We do not want to avoid criticism,—in fact we are anxious to attract it; but we should prefer to leave the criticism to our readers, keeping the articles themselves as independent contributions. We shall be disappointed if the articles do not stimulate vigorous thought: and we hope that telegraph men and women will express their views freely in the form of letters to the Editor. (Letters will be published over a pseudonym, if the writers wish; but in that case a statement of the name, rank and office of the writer should be supplied to the Editor, though not for publication.)

In our November number we invited our colleagues on the Telegraph side to help us to ensure that telegraph matters should receive in the *Journal* the attention that they deserve. We know that in present circumstances telegraph men and women have reason to be discouraged; but we believe that beneath this discouragement there lurks a real pride in their craft and a confidence in the future of telegraphy, that have all too few opportunities for expression. This *Journal* is intended to act as a medium for the interchange of opinions on telegraph subjects: our readers can help us, by bringing the *Journal* to the notice of their colleagues, to make its appeal on the telegraph side more extensive; and above all, they may help to make our appeal more intensive by sending us their opinions on current problems. It is for these reasons that we specially commend this series of articles to the attention and co-operation of our readers.

The first of the series, which will appear in our next number, is by a Telegraphist in the Central Telegraph Office.

THE WORLD'S TELEPHONES.

We present in another column our annual review of the telephone development of the world at the end of 1927. As we remarked in connexion with the 1926 statistics, it presents no novel features. About a million and a half telephones were again added to the world's total, and again over 800,000 of these were provided by North America and about half a million by Europe. The rate of increase in Europe has fallen from 7 to 6.4%, while that of North America has fallen from 5 to 4%, but it will generally be found that as density of telephone development increases the percentage rate of increase tends to fall.

Attention may be drawn to some noteworthy facts in these interesting statistics. Of the 8½ million telephones in Europe more than half are to be found in Great Britain and Germany; of the

million telephones in Asia, over 700,000 are in the Japanese empire; of the 187,000 in Africa about half are in British South Africa; of the total of nearly 20 millions in North America, 18½ are in the United States and 1¼ million in Canada; whilst of the 440,000 in South America exactly half are in the Argentine. The number of cities in the world with 10,000 telephones was nearly 300 at the end of 1927 and is doubtless above that number now: and of these, over 60 cities contain 50,000 telephones within their local areas.

If evidence were necessary of the importance of obtaining accurate telephone statistics up to as late a date as possible, it would be found in the fact that the telephone system of the world grows steadily at the rate of a million and a half a year. Consequently, figures which are only two years old—quite young ones, in fact, as official statistics go—fall short of the actual total at any given year by no less than three millions. The 20,800,000 telephones of 1920 had become 30,748,000 by the end of 1927.

HIC ET UBIQUE.

We learn that telephone service between London and Warsaw is expected to be opened early in January. The charge for a 3 minute day call will be 15*s*. 3*d*.

A writer in the *Daily Chronicle* says :—

> At lunch yesterday a man spoke highly of the automatic telephone; it served him very well, he said. At dinner a woman abused it to me with measureless annoyance. And they are both on the same exchange! My own experience of it in America and in Edinburgh recently has been fortunate. Of course, it is rather irritating, when you can't get a number, not to be able to speak sharply to someone. But I have almost always found that I could get the numbers I wanted. Is the failure of some of the grumblers due to their own faults, I wonder?

His heading, by way of comment, is "Not Fool-Proof."

It is reported that the Swedish-Finnish cable is so far completed that communication was opened between Stockholm, Norrtelje and Osthammar and Mariehamn, in the Aland Islands, on the 14th of last month. (The opening of service between Sweden and Finland is stated in the Press to have been inaugurated on Dec. 22.)

In Mr. Humbert Wolfe's recently published volume of essays, "Dialogues and Monologues," there is one on "Public Servants in Fiction." After reviewing the excursions of Dickens, Trollope, Rudyard Kipling, H. G. Wells, Arnold Bennett, E. V. Lucas and Edward Shanks into this field, Mr. Wolfe concludes :—

> You will see that the general view appears to be that what Public Servants serve is generally a double fault. But somehow they don't lose the set.

Commenting on the discussion in the House of Commons and in the Press as to the suitability of Welsh candidates for posts in London telephone exchanges, Mr. Caradoc Evans, the novelist, falls foul of the Welshman and Welsh voices and is reported to have said: "On the 'phone he is impossible. That is why I should think that in Cardiff and Swansea there are fewer telephone users than in any other part of Great Britain." This shows the danger of speaking without your book. Cardiff has the highest telephone development of any large city in Great Britain except London and Bournemouth.

On Nov. 6 last, telephone conversations were exchanged between Edmonton, Alberta, and Victoria, B.C., in order to mark the completion of the western link in the "All-Canadian" trans-continental telephone line. The completion of the new line not only enables Calgary, Edmonton, Vancouver, Victoria and other points in Alberta and British Columbia to converse with each other and with points in central Canada over all-Canadian wires, but with the last link between Quebec and New Brunswick nearing completion, forms an important link in a coast-to-coast service which is assured in the near future, with no foreign point touched.

According to a recent (June, 1928) official report on "Economic and Financial Conditions in Germany," Germany possesses 24 radio-transmitting stations, and the greatest attention is being devoted to the perfection of all types of radio. In August, 1927, a direct public radio-telegraph service was opened by the Transradio A.G. between Berlin and the Philippines (Manila); the rate is Mks. 3.20 per word for ordinary and 95 pfennigs for Press telegrams. For the time being Germany is dependent upon the London stations for radio telephony to the United States, but preparations are being made for a direct service with a transmitter at Nauen and a receiver at Beelitz. During the autumn radio-telephony between Berlin and Buenos Aires is to be opened. About the same time Berlin is to be connected with Mexico and Siam by short-wave radio-telegraphy and telephony. Towards the end of 1928 the large radio-transmitting station which is being built in Japan by German firms will be finished, so that sending will then be possible in both directions instead of, as now, only from Germany. In the meantime, experiments will be made in transmitting telephone messages and pictures with the Nauen short-wave sender to Tokio. While Germany's radio services with other countries are dealt with by the Transradio A.G., those within the country are under the Ministry of Posts, which is also substitutihg short-wave for long-wave installations. The police have ordered a number of portable short-wave sets with which country police on patrol can get into touch with headquarters at any time. The number of subscribers to the German broadcasting system was 2,000,000 at the beginning of 1928, an increase of about 500,000 during the year.

[The radio-telephone service between Germany and Buenos Aires was opened last month (from Berlin on Dec. 10, from other German towns Dec. 21), and is limited at the Argentine end to one specified station in Buenos Aires. We have no information as to the direct Siamese and Mexican services, but service to Mexico is, of course, already obtainable via London.—ED., *T. & T. J.*]

According to the *Times*, it is officially announced the public service between Amsterdam, Rotterdam, The Hague, and Utrecht, and the four leading towns in the Netherlands East Indies will be opened on Jan. 8. The minimum charge for an ordinary call booked two days in advance will be £2 10*s*. Special calls at a higher charge may be put through at once.

DEATH OF JOHN LEE.

As we go to press, we are informed of the death of Mr. John Lee, late Controller of the Central Telegraph Office and one of the original Editing Committee of this Journal. He died on Dec. 24 on board the liner *Laconia* on his way home from a tour in America, and was buried at sea. Before he retired, it was known that his constitution was impaired as a result of his unceasing activity and service; and that his strength was all too slight to sustain that vast spiritual force. His friends all over the world will mourn his loss, with a feeling of pride at the privilege of having been associated with him, and a confident belief that his indomitable soul goes marching on. To his wife and family, and to that wider family of his, his colleagues at the C.T.O., we offer our warmest sympathy.

THE LONDON AUTOMATIC SYSTEM.*

BY M. C. PINK, ASST. CONTROLLER, LONDON TELEPHONE SERVICE.

VARIOUS articles on the question of Automatic Switching have appeared in the Service magazines and the newspapers have given a certain amount of publicity to the subject since the task of substituting automatic switching methods for those previously employed was commenced in the London area; and Mr. H. G. S. Peck dealt with many aspects of the subject from an engineering point of view in a most interesting paper given recently to the Institution of Post Office Engineers. No general review of the position has, however, been put before this Society, and it is my task this evening to attempt to make such a review. The subject is a very wide one and it will obviously be impossible to deal in detail with any particular phase. I propose however to show you statistics relating to the amount of traffic now handled by automatic plant and to tell you something of the measure of success with which this traffic is being handled. In the course of my remarks I shall touch on some of the difficulties experienced in connexion with this most momentous change and make a brief reference to the future.

The task of the Post Office in introducing automatic telephony in London was immense. It was necessary to ensure that when the first automatic exchange commenced to function, the subscribers on that exchange would be enabled to communicate with any one of a total of over 300,000 subscribers' lines without verbal communication with an operator. To render this possible plant had to be installed at practically all exchanges within 10 miles of Oxford Circus, which would respond to the dialling of any automatic subscriber, and would give a visible indication to the receiving operator of the number required by each caller.

Apart from the requirements of the automatic system itself a need had been felt for a modification in the method of handling traffic between manual exchanges in cases where it was not economical to route that traffic direct from one exchange to another. With the necessary establishment at manual exchanges of the visible indicator equipment to which I have referred, it was possible to combine with the preparations for the introduction of full automatics, a scheme for the automatic switching, at a central point, of indirect manual traffic. The central switching point is known as the Tandem exchange. This exchange will be fresh in the minds of many of you; but it may be helpful to some if I run over its functions very briefly.

Under the old conditions the "A" operators had to remember a number of junction centres, arranged on a geographical basis, and select the proper centre for a given call. Under Tandem switching conditions the "A" operator passes all indirect calls to an operator at a key-sender "B" position in Tandem exchange. The Tandem operator allots a junction to the calling exchange and then taps out on a set of keys the first three letters of the name of the required exchange followed by the four digits of the required number. A junction to the objective exchange is found automatically, the Tandem apparatus transmits the particulars of the required number over that junction and the signals either set the switches direct, and cause the required subscriber to be rung, in the case of a call to an automatic exchange or, if the objective exchange is manual, cause the number to be displayed on a lamp indicator in front of the "B" operator at that exchange.

Fig. 1 shows the amount of traffic handled weekly through Tandem since it was brought into service.

Apart from various operating items to which I shall refer later, the correct transmission of any required number to the objective exchange after correct receipt at Tandem is dependent upon:—

(1) Accurate keying of the Tandem operator.

(2) Accurate transmission of this keying from the keys themselves to an automatic sender which controls the main switches of the Tandem exchange and transmits the required number over the junction appropriated for the call.

(3) The correct working of this sender.

(4) The accurate operation of the Tandem switches in response to the sender impulses.

(5) The accurate reception and transmission over the junction in certain cases by a further piece of apparatus known as a "Coder."

(6) The efficiency of the junction used.

(7) The efficiency of the receiving and display apparatus at the distant end.

(8) Accurate connexion by the manual operator at the objective exchange.

In order to secure the best service results various alterations have had to be made in the original circuit arrangements. These have reduced the measure of difficulty but there are still further problems to be tackled. Nevertheless the service improvement has been definite and the tendencies are healthy.

In order to determine the quality of service given, a system of observation at manual exchanges of traffic passed via Tandem has been instituted.

* Paper read before the London Telephone and Telegraph Society.

Fig. 2 shows the more recent results obtained on these observations. The percentage of O.K. calls is improving. With any system of automatic switching—particularly in the present stage of development—it is inevitable that some cases will occur where the call has passed to the plant but the plant fails to set up the required connexion and nothing is heard. In the case of traffic going through Tandem the operators at manual exchanges

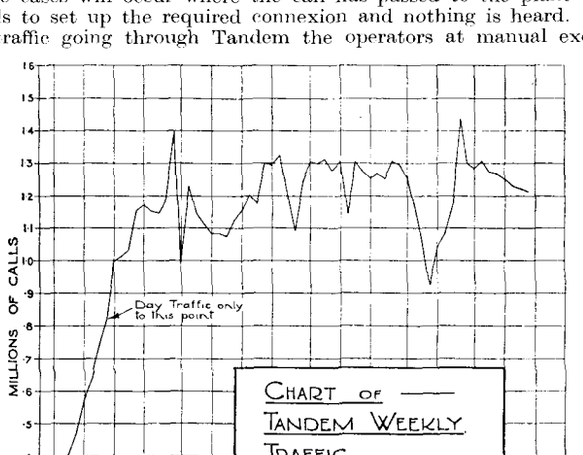


FIG. 1.

are able to supervise the traffic closely and if they do not get what is known as a Ringing Tone—which indicates that the required subscriber is being rung—after a reasonable interval, they are able to re-pass the call. This type of failure is rapidly diminishing.

The plant is so designed that if for any reason the whole of the seven impulses required for the proper transmission of a standard call are not

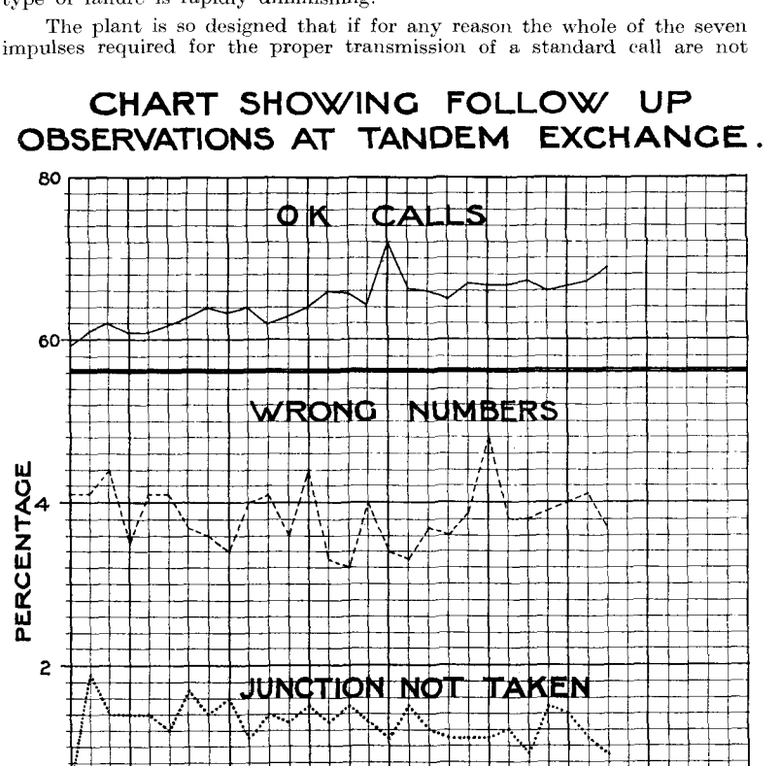


FIG. 2.

received by the transmitting plant, the call shall be diverted to a manual operator in the Tandem exchange. Fig. 3 shows the number of such cases occurring daily. These cases only represent a fraction of 1% of the total traffic handled, but they have been too numerous. It is hoped that in due course they will be almost if not entirely eliminated but it is satisfactory to notice how rapidly they have diminished in the last week or two.

It will have been gathered from what I have said that for the setting up of a Tandem call a piece of apparatus known as a "Sender" is all-important. A sender is only switched in for a short time on each connexion. As soon as a sender has completed its allotted task it should be switched out automatically and restored to a common pool for use again on another call at the earliest possible moment. A certain amount of difficulty has been experienced in practice in securing the rapid return of senders to the common pool and at times the demand for senders has exceeded the availability. This feature assumed serious dimensions at times. Circuit modifications were introduced to ensure the more rapid release of senders and the trouble has been overcome.

I will now deal with the public automatic exchange system, and as a reminder to those in the audience who are not in day-to-day touch with automatic telephone questions I will run briefly through the outstanding features of automatic switching.

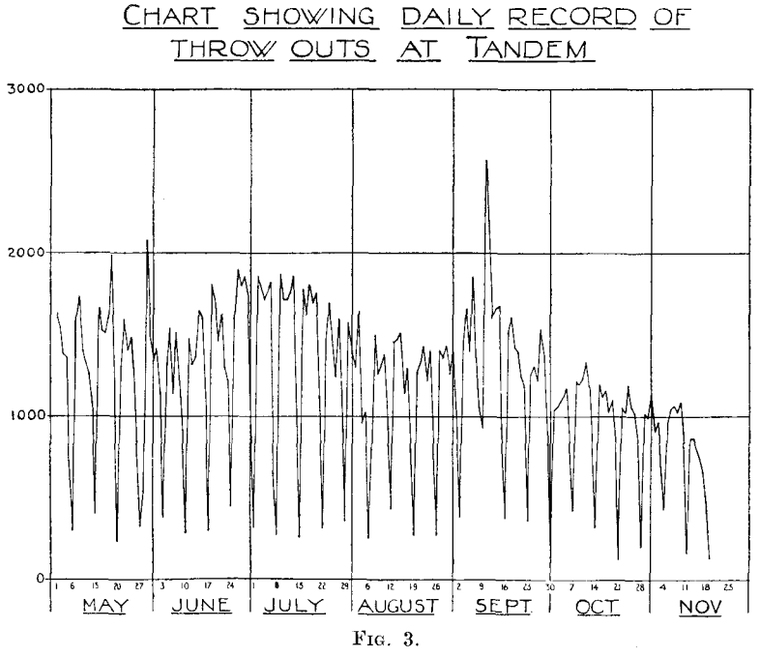


FIG. 3.

Each subscriber on an automatic exchange is provided with a dial for signalling purposes. The figures 1 to 9 and 0 appear on this dial together with the letters of the alphabet. The first three letters of the name of the exchange are shown in capitals in the Directory in the subscribers' entries relating to each exchange in the automatic area and to obtain connexion to any such subscriber the caller dials in succession these first three letters followed by the four digits of the required number. This process sends a train of impulses to the automatic exchange. These impulses reach a piece of apparatus known as a "Director." This director receives the impulses from the subscriber, translates those relating to the first three letters of the exchange name into a particular code which can be varied by the administration as required, and which directs the call through a train of switches to the exchange required. The director then sends out signals corresponding to the four digits of the required number; and through the switches the call is established automatically either direct to another automatic subscriber or through a Coder Call indicator position to a subscriber on a manual exchange.

If the subscriber desires help in the setting up of calls, or wishes to make an enquiry, he dials "O" and is connected automatically to a manual switchboard.

Traffic incoming to an automatic exchange from other automatic exchanges is received direct on numerical switches. The traffic from manual exchanges is handled as a general rule at key-sender "B" positions similar to those referred to in my description of the Tandem exchange.

The automatic exchanges at present in use in the London area are as follows:—

Exchange.	*Date of Opening.*	*Capacity in Lines.*	*No. of Working Lines at Nov. 17, 1928.*
Holborn ...	Nov. 12, 1927	9,400	6,064
Bishopsgate ...	Mar. 3, 1928	8,100	5,309
Sloane	July 28, 1928	8,400	4,979
Bermondsey ...	Sept. 1, 1928	2,700	1,492
Monument ... Mansion House	Nov. 3, 1928	9,400	802
Welbeck ...	Dec. 1, 1928	8,700	900
		46,700	19,546

With the opening of automatic exchanges we at once strike a difference in the statistical representation of the traffic handled. Fig. 4 shows graphically the traffic handled at the Holborn exchange prior to the automatic conversion and a projection of what the recorded traffic would have been in the ordinary course had the manual conditions continued. Each automatic exchange is provided with meters on the directors, and every time a director is released after seizure for a call the director meter operates. A director is only seized if a subscriber not only removes his receiver but also actuates his dial in some way. You will see that the director readings are very much in excess of the manual estimates. There are various causes contributing to this excess. In the early days of the Holborn exchange all routine tests were included in the director readings. In some cases there were minor defects on the Coder Call Indicator equipment at manual exchanges and calls were routed to some service point and had to be credited. If the caller seeks the assistance of an operator and she makes connexion for him a director is used for his call to the manual board and a further director is used by the operator to establish the call. Every extra attempt on the part of the operator will be recorded on the director and whereas under manual conditions the operator might make a number of attempts without involving any record on her registers, every attempt which the automatic subscriber makes himself on his own initiative will be recorded. It will be seen, therefore, that account has to be taken of these various factors in interpreting the director readings of an automatic exchange.

Fig. 5 shows the weekly director meter readings for each automatic exchange separately and for the automatic system as a whole. You will notice the increase in the running curve as each new automatic exchange is added. It will be seen that the amount of traffic per week is now well over 1 million calls.

We will now turn from traffic volume to the question of service efficiency. In considering the statistical representation of service results it is necessary to have constantly in one's mind the different conditions under which the calls are made in the manual and automatic systems. When we observe manual service results we follow an individual subscriber's experiences in obtaining a particular call That call may not go through on the first attempt of the operator. She may have to change the junction to the objective exchange or take some other step to ensure the satisfactory completion of the call; and if in the end that call is completed for the caller the transaction is regarded as O.K. in the observation statistics. Under automatic conditions the caller has no operator to help him out in case of doubt or difficulty unless he calls specially for her. If a change of line is desirable the caller has to

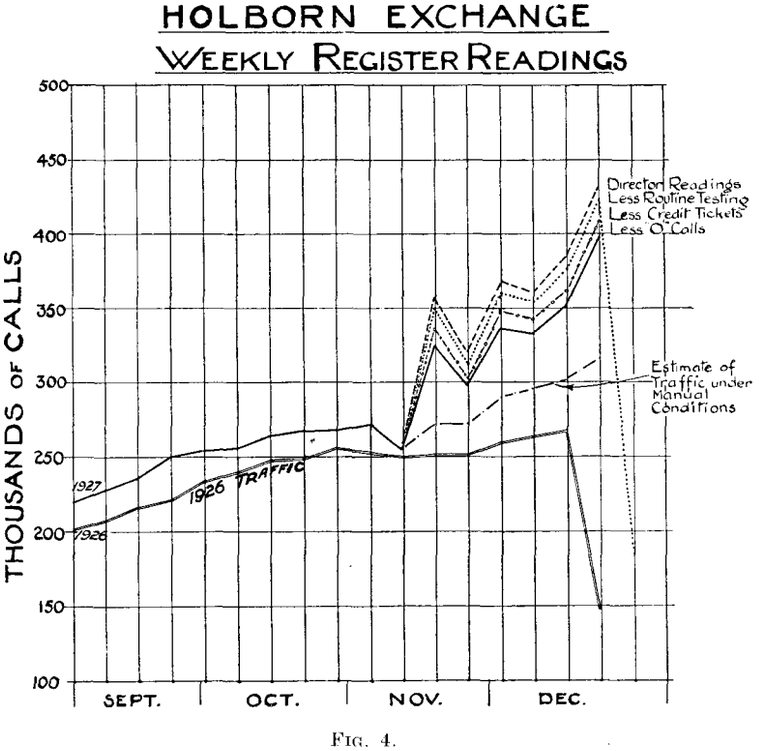


FIG. 4.

abandon his first connexion and dial again. The observation conditions do not provide for the following out of each call as an individual transaction. Each attempt is a call from the point of view of the observer of this new type of service. Under such conditions the proportion of O.K. calls is inevitably curtailed. The caller uses his own discretion in the amount of time he allows for the answer of his correspondent and there is no doubt that in many instances he gives up his attempt before he has allowed time for his correspondent's answer. It is necessary to bear these points in mind in considering the service items shown in Fig. 6. This shows for each

Extra attempts are required by reason of the connexion of the Number Unobtainable tone, dialling errors and other miscellaneous causes, representing an increase in these statistics of about 13.0%. It will seen that if this figure is applied as a reducing factor to the percentage of calls completed manually (item 1, last column) the figure would be about 72.0%, or roughly approximate to that obtained under automatic practice. The further education

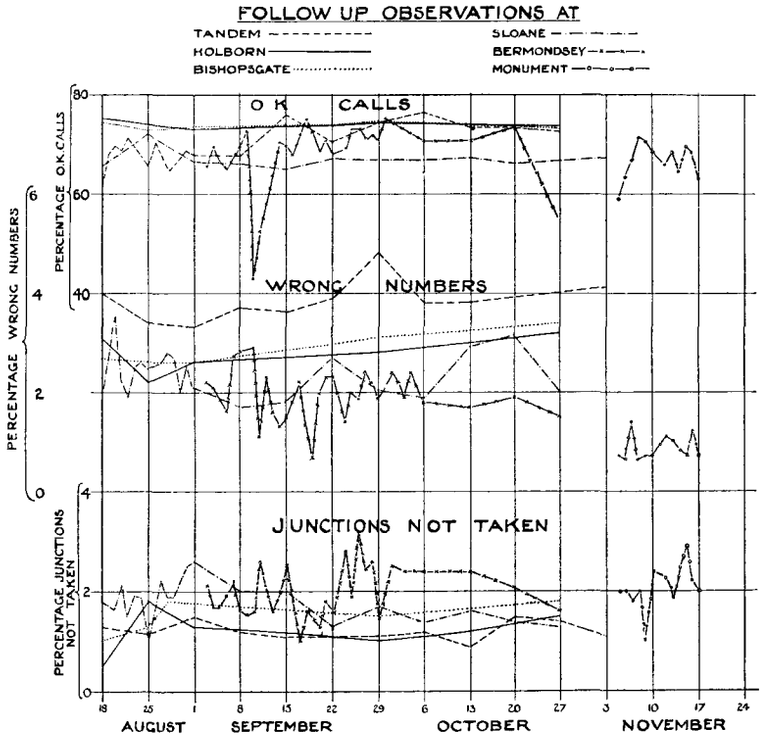


FIG. 7.

of the subscriber should tend to reduce dialling errors and other sources of waste effort. In this connexion let me quote from an article entitled "The Hand and the Dial," in *The Times* of Nov. 16 :—

> "I often start dialling before I lift the receiver. Midsummer madness, of course. Then my ear seems unable to discriminate between the many buzzings. A sign of a mis-spent youth. I should have been more assiduous and attentive in my visits to the apiary. Finally, I am overcome by the paralysis which attacks the typing neophyte. I can find S but not L—six but not one ; at least I *can* find them, but it all takes time. I am keeping somebody waiting ; who is it ? The operator ? No ; there is no operator unless I press O. The friend with whom I wish to communicate ? Certainly not, for I am not yet 'through,' but shall I ever be ? Something is happening now. What is it—the line engaged ? I must read the instructions once more, and in so doing I have lost the page with the number of my telephone. 'O ! for the touch of a dialling hand, and the sound of a voice that is still.' That's it, dial O, and when instead of the multiple buzzes I hear the voice of O, the relief is intense. Oh ! O ! ! "

We must keep our eyes on the gentleman whose tendencies are to dial "O" instead of learning a comparatively simple lesson !

The training of subscribers and exchange staffs has been no light task. It would be quite impossible to provide subscribers who were to be connected to an automatic exchange with written instructions and to secure their efficient co-operation merely on the basis of those written instructions. It is essential that every potential user of the automatic system should receive a personal explanation of the use of the dial and a demonstration of the results of such use. In order to provide for this instruction a staff of nearly 40 men has had to be organised and trained.

For further details I would refer you to an article by Mr. J. Pettigrew in the June number of the *Telegraph and Telephone Journal.*

Various jokes have been made in the Press about the instructions given to subscribers. Some of you may remember the picture that appeared in one of the illustrated papers of an instructor discussing matters with a truculent subscriber, who ultimately exclaimed "Do you want me to do all this myself—do you take me for a performing pig ? "

The training of the exchange staff is also a matter of considerable magnitude and importance. It must be remembered that subscribers who are to be cut over to automatic service have to receive manual service right up to the time of their transfer. In the meantime the automatic exchange has to be tuned up, traffic tests have to be passed in considerable numbers and from the time of opening of the automatic exchange an operating staff has to be available which can deal intelligently with any enquiry or complaint made by any unaccustomed user of the dial service. For this purpose a considerable number of reliable operators have to be withdrawn from their manual operating duties and given a course of training for the new work. They have to learn how to make out tickets relating to various enquiries and complaints which will convey the most information to the Administration with the least expenditure of time on the part of the operating staff. Difficulties met with by dial service subscribers differ in many respects from those experienced by manual subscribers, and each potential operator has to be given a course of practical training in the handling of calls of the various types. This training cannot be given at the expense of the public and it is necessary to set up special circuits and to arrange for teachers to act the part of subscribers, pass calls of the various types to the students, and instruct them in the treatment of those calls. The instruction problem was a particularly difficult one in the case of the first exchange opened, because it was impossible to foresee exactly what the experience and the attitude of the public would be. After the first exchange had been opened we were able to give students, at the end of their training course, some experience of actual public work before they took up their duties at a new exchange.

Reverting to the training of subscribers, I should mention that in addition to the training given at the subscribers' premises we invite every subscriber to visit a working model automatic exchange installed in suitable premises near each new automatic exchange.

Apart from these special demonstrations for individual subscribers, we are endeavouring to widen the interest of the public by demonstrations at exhibitions, and a very considerable measure of success has attended public demonstrations given by our staff in connexion with such events as "The Business Efficiency Exhibition," "The Model Engineering Exhibition," and "The Exhibition of Patents." We recently gave demonstrations in the Soda Fountain Lounge of Messrs. Barker's at Kensington, which were attended by 1,475 people. The model is at present at Messrs. Ponting's Stores. It is also interesting to note that instructions in using the dial have been prepared in Braille by the National Institute for the Blind.

The staff have to deal with some queer comments—for example, that of the man who remarked "You say I must dial the first three letters of the exchange name ; but how do I get on when I wants ''OP' ? "

I have stressed the question of the education of the public because there is no doubt we are calling upon the public under automatic conditions to visualise what is happening to a much greater extent than is necessary for them when an operator is responsible for seeing a call through. Apart from the dialling itself, which frequently leads to misunderstandings, some of which

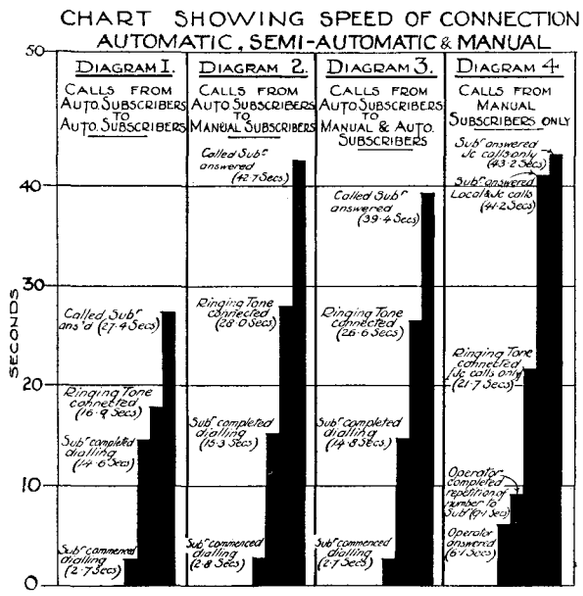


FIG. 8.

I will refer to later, the subscriber has to appreciate the full significance of tone signals. Most of you are quite familiar with the tone signals, but for convenience of reference I will recapitulate them briefly :—

Dialling Tone	... ...	A low continuous burring sound which must be heard by the subscriber after lifting his receiver before he commences to dial.
Ringing Tone	... ...	An intermittent low-pitched brrr-brrr——brrr-brrr——brrr-brrr heard by the caller while the called subscriber is being rung.
Busy Tone	... ...	An intermittent high-pitched buzz——buzz——buzz to indicate that the required subscriber or some intermediate channel is engaged.

Number Unobtainable Tone A continuous high-pitched buzz which is connected if the caller dials the wrong exchange code, the number for some reason is out of service, or if for some other reason the connexion he requires cannot be made.

A lady was endeavouring to explain to a friend the correct method of using a dial telephone and after a very disjointed explanation she added: "For heaven's sake, my dear, do be careful and not put your finger in the wrong hole or you'll bring on a jazz band!"

Early in the year it was clear that subscribers were not understanding fully the ringing and busy tones. An examination was made of the percentages of calls abandoned by Holborn subscribers at varying intervals of time, when the ringing tone was connected and when no ringing tone was heard. These are shown in Fig. 9. The curves demonstrated the tendency on the part of subscribers to abandon calls prematurely and it was decided to issue special circulars on the subject of tones. Further publicity was also given in the Telephone Directory. Conditions have improved, and results of a more recent examination are shown in the corresponding combined curves for Holborn, Bishopsgate, and Sloane.

Fig. 10 shows the *speed* of connexion of the ringing tone after completion of dialling in the case of "full automatic" and "automatic to manual" calls. This emphasises the speed of the full automatic system. The chart also shows the percentage of calls answered at various times.

I am sure we must spare no effort adequately to explain to subscribers the meanings of the various tones and the indications of the stages reached in a dialled call. Apart from treatment of the single line subscribers, much could be achieved if we established a special visiting staff to inspect the operating work done at private branch exchanges and advise subscribers on the means to be adopted in order to secure the best service results.

It is really surprising what misconceptions arise in the minds of the people who have not been adequately instructed in the operation of the dial system. A good deal of light has been thrown on this aspect of automatics by the experiences with the public at pre-payment call offices fitted with dials in association with Bermondsey exchange. Some people have thought that in dialling the first three letters of the name of the required exchange they must send three letters on the dial simultaneously. One bright person was found to be attempting to insert fingers in 7 holes simultaneously—corresponding with the 3-letter code and the 4 digits of the required number—and then to

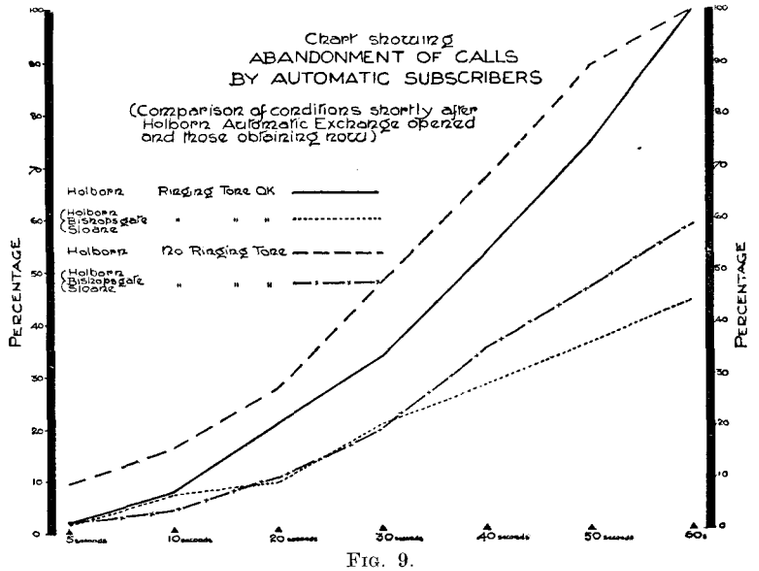


FIG. 9.

give the dial some sort of a twiddle in the fond hope that he would get through to his number. A selection from the very long list of erroneous practices is given below:—

Dialling without lifting receiver.
Dialling local number without exchange code.
Dialling code for Toll calls (e.g., DAR equivalent EAS).
Dialling from "O" to required letter.
Omitting to disconnect for "follow-on" call.
Dialling exchange name (particularly 4-letter exchanges) in full.
Prefixing all calls with "O."
Attempt to dial all digits simultaneously.
Misunderstanding codes.
Incorrect spelling "AVU," "HOB," "CLA," "WAL" (London Wall).
Dialling exchange name only, number spoken into transmitter!
Dialling without inserting the coins.
Button "A" or "B" pressed immediately after number has been dialled.
Dialling "AVE" (code appearing on instruction card) before all calls.
Button "A" depressed to obtain "O."

The area served by the Bishopsgate exchange comprises a large part of the Jewish quarter. A good deal of difficulty was experienced in the first instance in getting some of the more illiterate subscribers to use the dial. I am told on very good authority of one gentleman who badly wanted to get on to a Wimbledon number and failed every time. It was subsequently found that our Hebrew friend was repeatedly dialling VIM!

A good deal of trouble has been experienced owing to subscribers either imagining that they are supposed to dial more than the first three letters of an exchange name or doing so unconsciously. Such short names as EAST and PARK form a trap for the unwary; and it has been necessary to insert

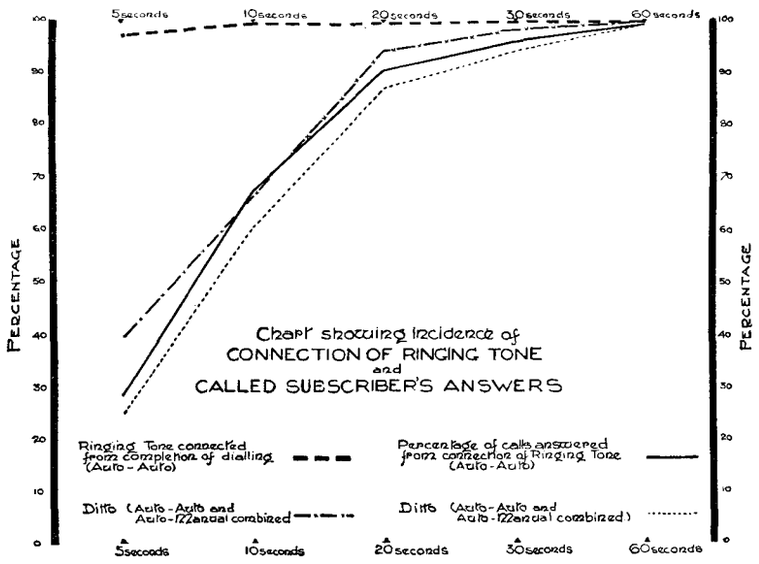


FIG. 10.

a special warning notice in the preface of the Telephone Directory. It will be appreciated that if the subscriber who wants East 1234 dials E A S T in full followed by the number he will actually get through to East 8123, as the redundant letter "T" thus becomes, from the signalling point of view, the numeral 8.

I have nothing but praise for the interest which the operating staff have taken in this new and most important development in the art with which they are associated. They have not spared themselves in endeavouring to secure the most efficient results from the new system. The responsibility of an operator on outgoing positions is a particularly important one in helping with difficulties and securing the smooth working of the system. The manual board operators come to the assistance of the subscribers who have difficulty owing to "No reply" from the wanted subscriber or frequent receipt of the engaged signal. They also provide information in cases where the "Number unobtainable" tone has been connected, &c. Their experience often enables them immediately to diagnose the causes of troubles experienced by subscribers. A little judicious questioning may elicit such information as that the subscriber has dialled CLA for Clerkenwell or HOB for Holborn. One man explained to the exchange that he always got an operator, no matter what he dialled. In discussing the case the subscriber suggested that it would be an advantage if the finger stop were removed. It was then discovered that his practice was to move the dial round to the finger stop and then continue the rotation beyond the stop with the other hand, with the result that every signal he sent was converted into "O"!

The assistance operator carries out excellent work in training subscribers in the method of reporting difficulties. This statement shows the percentages of calls of various types handled by assistance operators on Holborn exchange, together with the operating values of the different types in units and the overall average operating value per call:—

Item.	%	*Factor.*	*Value in Units.*
1. O/G enquiries and assistance	31.1	10.0	311.00
2. I/C enquiries and complaints	19.5	6.0	117.00
3. Coin box—postpayment ...	25.0	4.5	112.50
4. Changed number interception	11.4	3.5	39.90
5. Trunk offering	1.7	6.0	10.20
6. N.U.T. Queries	2.3	7.0	16.10
7. Service P.B.X.	9.0	1.5	13.50
	Total		620.20
	Average Value ...		6.20

As a result of improvements in the subscribers' and operators' work the average operating time per enquiry and complaint call, which was 124 seconds in February last, had been reduced by May to 107 seconds and is now less than 90 seconds.

The satisfactory connexion of incoming traffic is dependent upon the efficiency of the operators at keysender B positions. The work of the B operator is of a more routine character. The staff serving these positions have done excellent work. With the best will in the world, however, some errors will arise, and the following list shows some of the possibilities :—

"*A*" *Operator.*
- Fails to pick up junction allotted.
- Clears junction prematurely (RT. O.K.).
- Passes demand for wrong number or exchange.
- Holds original junction and passes fresh demand for number.
- Breaks in on order wire; plugs in incorrect junction.

Keysender "B" Operator.
- Fails to key up completely.
- Keys up when no outlets available (all sender finder lamps glowing).
- Keys up wrong number.
- Depresses assignment key too quickly (thereby clipping number of junction allotted).
- Does not wait for flicker on sender lamp after keying up a call.
- Keys up despite failure to secure an outlet (i.e., failure to recognise an equipment fault).
- Quotes incorrect junction number to "A" operator.
- Omits to depress relative junction assignment key after allotting junction.

"*B*" *Operator at C.C.I. Position.*
- Connects wrong number (display O.K.).
- Connects an engaged line.

Faulty Articulation.

In the earlier stages the conditions were exceedingly trying, and in the consideration of the question of whether the human element or the plant is to blame for certain service failures the fact that the human element will inevitably be responsible for some measure of trouble has given rise in some instances to a tendency to attribute more blame to the human element than was justifiable.

(*To be continued.*)

THE LOST OFFICE CIRCULAR.

WE congratulate our colleagues of the "F" Division, C.T.O., on their Christmas card, which has this year been expanded into a circular of eight pages. In its general format the "Lost Office Circular" resembles its prototype; other features of resemblance are a List of Vacancies, notices to the staff on Single Day Absences and Special Leave, a list of Offices Open for Telegraph Business (which is short) and a list of Awards for Suggestions (which is even shorter). But, unlike the Post Office Circular, it may be read without the preliminary application of a paper knife; among other original features are a record of the net circulation figures (the Post Office Circular has alway been very modest about its circulation), a Free Insurance Scheme (a little vague in its scope), a collection of funny stories, answers to correspondents, copious illustrations and advertisements. The advertisements classified under the heading "Postal Bargain Corner," are perhaps the best feature of all. The Circular expresses that spirit of self-depreciation which is characteristic of the British race. During the war, when the Press extolled the gallant valour of the men in the trenches, those heroes themselves would describe themselves as "Fred Karno's army," or "a rag-time show," and would frequently thank Heaven for the existence of a Navy. We may suspect that such expressions were partly a safety-valve for the trials to the patience and the temper sustained in the course of a wearisome and arduous task, partly a "camouflage" for the pride that must never be expressed. Applying the same arguments here, we may infer that the "F" Division of the C.T.O. is very proud of itself—as indeed it has good reason to be.

The jokes are for the most part hardly suitable for reproduction; the full meaning of some of them can only be perceived by the initiated. But even for the uninitiated the Circular is far too good to miss, and we suggest that those of our colleagues who have not received a copy of the Circular should buy a copy for themselves; we understand that there are still a few copies left, obtainable from Mr. C. Young, "F" Division, C.T.O., at a cost of 1*s.*, including postage. We understand that any surplus over expenses will be handed over to the Trustees of the Fund for relief of distress in the mining areas.

Though it is unfortunately too late to return the Christmas wishes of the "F" Division, we heartily wish to them and to the telegraph service in general a good and prosperous New Year.

TELEPHONE PIONEERS.

GATHERING OF EX-NATIONAL TELEPHONE MEN.

A TRULY remarkable gathering assembled at the Criterion Restaurant, London, on Monday, Dec. 10, when nearly 450 ex-members of the National Telephone Company's staff and their guests met at dinner. The idea originated with Lieut.-Col. C. B. Clay, and the necessary arrangements were carried out by a committee consisting of himself, Messrs. W. W. Cook, F. Gill, P. J. Ridd, W. A. Valentine, T. A. Prout (Secretary), and H. M. Darville (Treasurer). Their efforts were crowned with the utmost success, for despite the fact that 17 years had elapsed since the Company's existence ceased, they secured the attendance of all the chief officers (save one in Stamboul), the sole surviving director Lord Harris, and of existing and retired executive officers from all parts of the country. Besides those named in the Chairman's speech there were present Messrs. R. Shepherd, J. C. Chambers, G. F. Preston, A. Coleman, F. Cowley, W. A. Valentine, John Scott, T. A. Prout, and District Managers, Contract Managers, Engineers and others too numerous to mention separately, and a host of old friends who had not met one another for 17 years. Amongst the guests were Mr. W. T. Leech (Director of Telegraphs and Telephones), Mr. F. H. S. Grant (Assistant Secretary), Mr. L. T. Horne (late Assistant Secretary), Col. Purves (Engineer-in-Chief), Mr. Sinnott, Mr. de Lattre, Lieut.-Col. O'Meara and others of the Post Office staff, Mr. J. E. Kingsbury, long associated with the Western Electric Co., and Mr. H. Lawes-Webb.

Col. CLAY, who presided, proposed "Old Associates," and said that after the farewell dinner seventeen years ago he had not anticipated that he would be called upon to preside at such a gathering. Unfortunately, as was inevitable, many of their old associates had passed away since they last met, but many veterans were with them still. There were Lord Harris, their old director, Mr. Goddard, their General Superintendent, Mr. Anns who was the Secretary, Mr. Sinclair and Mr. F. Gill, successively Engineers-in-Chief, and Mr. Cook. Then they had two of the oldest pioneers present. One was Mr. C. J. Phillips who joined the service on Sept. 9, 1879, and whom he believed was the oldest telephone man in the country. Near him was Mr. J. S. Holt, who joined the old Lancashire and Cheshire Co. in November, 1879, and who was now 85 years of age. During the war he worked regularly in the Bournemouth Post Office as a telegraphist. Now they had got together he suggested they should stick together and should see if they could not form a Telephone Pioneers Society. The people doing the work to-day were preparing the way for a larger telephone service than they perhaps dreamt of. Many years ago he attended a meeting at which it was calculated that 10,000 telephones were the maximum that could be looked for in London, but to-day they had in London 600,000 telephones.

Lord HARRIS, responding, said that he was the last surviving director of the old National Company, and he was less capable than any of his old comrades to speak on the history of the company, as he came in comparatively late, and his activities were rather in the direction of overcoming political obstruction than in pushing the activities of the telephone itself. The public was not now as critical of the telephone as it was in the company's time. During the whole life of the company it had not a friend outside the board, the staff and the executive officers. He used to accompany his friend, Mr. James Staats Forbes to interview various politicians, and with very little success. Much of the opposition to the service at that time was most absurd, and if it had not been for the audacity of the late Mr. W. E. L. Gaine and Mr. Goddard, the company would not have been in as good a position as it occupied at the time its licence expired.

Mr. STANLEY J. GODDARD said he was now a telegraph man, but now that telegraphy and telephony could be carried on simultaneously on the same cables, it was possible that telegraph and telephone men might come closer together. The National

staff were a happy lot in the old days, and they had no reason to be ashamed of themselves. They all worked to produce a service which he thought was going to stay.

Mr. W. A. VALENTINE said he had been asked to reply for those who were still in the "firing line." Speaking of the progress that had been made, he said London, Sweden, Spain, and Germany could be connected over the transatlantic wireless with New York, San Francisco or Vancouver, and they looked forward to the time, not so very far distant, when they would converse with India and Australia.

Col. T. F. PURVES, Engineer-in-Chief of the General Post Office, said before the transfer of the company's undertaking they of the Post Office had made many friends in the ranks of the National Company, whose knowledge and longer experience they recognised. He thought it was now admitted that the men who did the great and delicate work of grafting the two staffs together did it with a measure of success which deserved the highest commendation. He did not think the transfer of the undertaking to the Post Office made the Press or public less inclined to criticise it.

Mr. FRANK GILL, who received quite an ovation, proposed the toast of "The Chairman," and remarked that perhaps the scope of the telephone service was not always realised. If there were a telephone in that room one could ring up 26 million telephones. He also suggested that a big telephone push in this country would do a great deal to reduce unemployment, and confer a general public benefit.

The CHAIRMAN, in acknowledging the toast, said thanks were due to Mr. T. A. Prout, Secretary, and Mr. H. M. Darville, hon. treasurer, for the work they had done.

The musical programme was much curtailed in order to give all present an opportunity of mingling and renewing acquaintance with old friends. Time, therefore, admitted of no encores to those excellent artists Miss Phyllis Pidgeon, Mr. John Whiffen, and Mr. Arthur M. Hemsley. A topical song, "Telephone Pioneers," written by Mr. W. H. Gunston, to the familiar air of the "Vicar of Bray," aroused considerable enthusiasm. Mr. Hemsley sang it admirably, his fine method making every point in the lines tell. In response to several requests, we give it in full:—

When PREECE the telephone first brought
  Across the Atlantic ocean
A scientific Toy 'twas thought—
  A sort of "Yankee notion."
But men of faith and foresight laid
  A Company's foundation
Which earned despite full many a slight
  The goodwill of the Nation.

Chorus:
  Then let's acclaim the Company's name
    Which this great work began, Sir.—
  Those pioneers deserve the cheers
    Of every telephone man, Sir.

So well did our new Toy succeed
  That soon—you needn't laugh, Sir,—
By legal lights it was decreed
  To be a "telegraph," Sir.
But, whether telegraph or 'phone,
  It triumphed in all quarters
And the good ship manned by FORBES and BRAND
  Rode o'er the troubled waters.

When Blackburn's loss became our GAINE
  Our progress was unceasing,
And all throughout his able reign
  The system kept increasing.
The London service day by day
  Like a colossus spread, Sir,
An idol not with feet of CLAY
  For CLAY was at its head, Sir.

The names of SINCLAIR, GODDARD, ANNS,
  Of PRESTON, GILL and CHAMBERS,
Of WATSON and CLAXTON, COLEMAN, COOK
  Who is there but remembers?
Where are they now, that famous band?
  Some rest from their long labours,
But most of them among us stand
  And are right welcome neighbours.

To name our scattered clan's new rôles
  Is more than time enables,
PHILLIPS plants fruit instead of poles
  And GODDARD governs cables.
And GILL's activities, fame says,
  The universe embrace, Sir,
And WATSON changes kilt for fez
  (Not worn in the same place, Sir).

They say that SHEPHERD moves about
  Mid odalisques adoring
By Marmora's shores; while busy PROUT
  Spends half his time plus-fouring.
JOHN SCOTT is making safety glass,
  No motor smash can break it!
'Twill ne'er be used for Port or Bass
  Or John Scott would not make it.

All Hail, survivors of our line
  Who still the standard carry!
May London have its VALENTINE
  For many a February.
Hail to our last Director, hail!
  Nestor of English cricket—
Lord HARRIS, never known to fail
  At council-board or wicket.

REVIEWS.

"Heaviside's Electrical Circuit Theory." By Louis Cohen. (Published by the McGraw-Hill Publishing Co., Ltd.) ix + 169 pp. Price 12s. 6d. net.

Among the classical books bearing on electrical communication, Oliver Heaviside's monumental treatise on Electro-magnetic Theory takes high rank. Unfortunately, however, the mathematical methods which he used are not familiar to the generality of telegraph engineers, and consequently his work has remained, to many who would otherwise have made good use of it, a closed book.

In the present volume an attempt has been made to clear away the obstacles just mentioned, as far as the theory of the electrical circuit is concerned, and this attempt has been very successful. The subject matter is presented in so clear and simple a manner that many of the difficulties which are felt with the original treatise have disappeared.

In the first chapter the operational calculus is described, and applied to the solution of the familiar fundamental problems of the alternating current circuit.

The second chapter deals with the Expansion Theorem, by means of which problems concerned with the current and voltage distribution in all kinds of circuits, under steady or transient conditions, can be solved. This theorem is of very great importance, as by its means problems can be dealt with which could not be solved at all by the usual methods.

The third chapter deals with electric filter circuits, the fourth with ocean cables, and the fifth with transmission lines.

The sixth chapter deals with the theory of artificial lines, and in the next is given Heaviside's derivation of the Expansion Formula, as an alternative to the easier method of deriving this formula which is given in the second chapter.

In an appendix is given a note on Bessel functions, a collection of various mathematical formulae, and tables of Bessel functions and of experimental and hyperbolic functions.

The book is excellently printed, and we can thoroughly recommend it to all who desire to obtain a thorough grasp of the fundamental principles on which electrical communication is based.

GLASGOW TELEPHONE NOTES.

ABOUT 130 people, including telephone staff and friends, desire to thank Miss Isaacs and her band of willing helpers from the Western Exchange for a very pleasant evening spent on Dec. 5 on the occasion of their annual Whist Drive held in Colquhoun's, Dowanhill House. Mr. Coombs, the District Manager, put in an appearance to lend his support to the social activities of the staff, but owing to a prior engagement, he was unable to be present the whole evening. Mrs. Coombs presented the prizes to the winners.

It is gratifying to note that the interest in that very deserving fund, the Civil Service Life Boat Fund, is being maintained by the Glasgow telephone staff. The amount contributed during 1928 was £17 6*s*., an increase of £2 17*s*. 6*d*. over 1927.

Calendars.

It is the "umpteenth" of January. If there is one fact in the world of which I am certain it is the date—not that it is the anniversary of my birthday, nor that of any of my friends, nor is it a special holiday or feast day—but I *know* that it is the "umpteenth" of January. Thirteen calendars adorning the walls of my bedroom, dining-room and study all collaborate to keep me cognizant of the fact! I often wonder if others suffer from this yearly—New Yearly—epidemic. Sometime in an unguarded moment, I must have said (when my friends gathered together in one place) that I liked calendars and found them useful! Each Christmas brings me calendars numerous and varied. The friends who know me in humorous vein send me funny little people by Mabel Lucie Attwell; those who find me serious send me "Great Thoughts" and "A Thought for every day in the Year"; others who have suffered at my hands send me "Household Hints" and the artistic friends know I appreciate beautiful forms and scenes.

Each year I am as worried as the Hanging Committee of the Royal Academy, as to where I shall hang my pictures, and in my despair I vow I shall scrap the lot at the end of January, but when the day comes "to do this thing" I find I am so attached to all of them that I cannot part with any. What am I to do? I continue to be told the date every way I turn, yet when I sit down to write a letter, I find myself saying "What's the date again?" The frailty of my memory makes me consider whether it would be wise "to pelmanise or not to pelmanise."

I have a premonition that should my friends read this they will all think I do not appreciate their gifts (and let me hasten to say I most surely do) and they will decide not to give me a calendar next year. What shall I do in that case for "a date"? On the other hand, each one may think that all the others will send me something else next year, and he or she only will send me a calendar as usual—in which case they will all send me a calendar! and the best of all is *that I really hope they will!!*

M. L. TULLOCH.

GLOUCESTER NOTES.

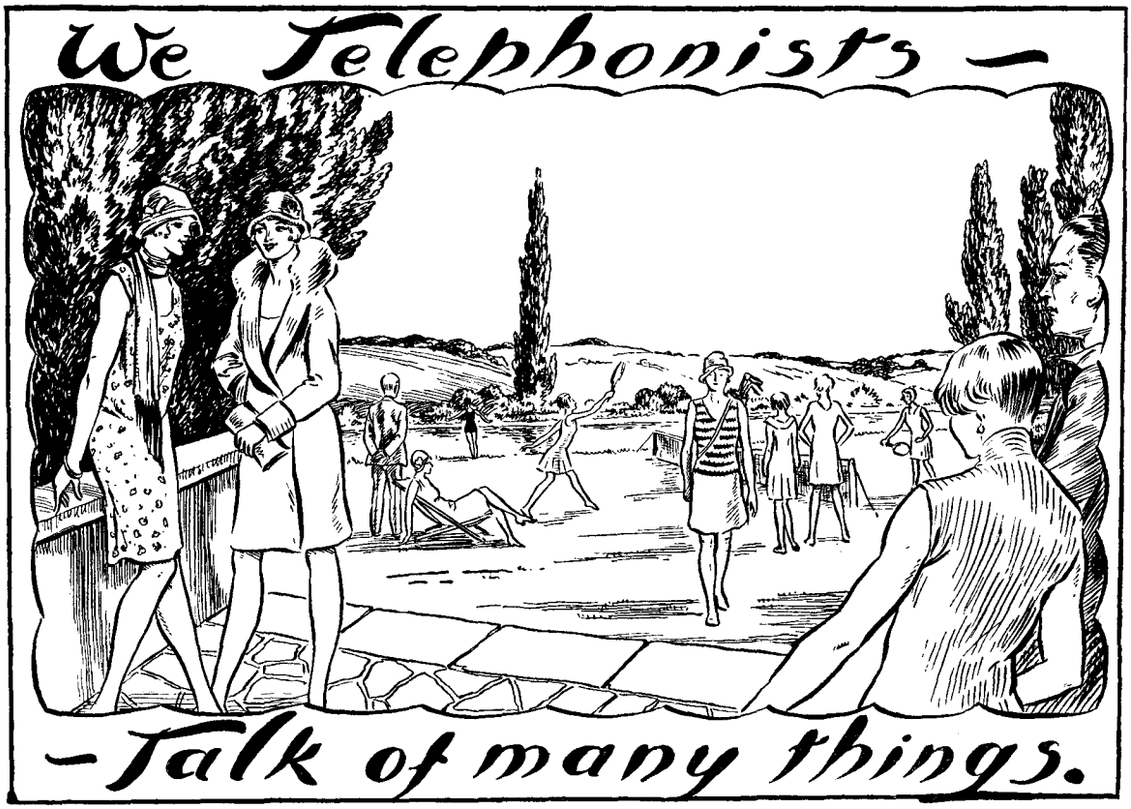
A PAPER on "The Hereford New Automatic Telephone System from a Traffic Point of View" was read by Mr. R. S. Grosvenor, Traffic Superintendent, Gloucester, before the Hereford Chamber of Commerce on Nov. 5, 1928.

A demonstration set was utilised to illustrate the outstanding features of the system and, in addition, each member of the audience was supplied with a simple diagram showing the system of switching. Special emphasis was laid on the question of the comparatively low calling rate at Hereford. The paper was well received and a discussion followed, questions relating to the paper and the Hereford telephone service generally being raised and fully answered.

When Miss A. H. Young, Travelling Supervisor, transferred from the Gloucester Telephone District to the South Wales District in September last, she was presented with an oak bureau, subscribed for by all the members of the staff of the Gloucester District, Traffic Section, and the exchanges in the Western Section.

Miss Young was universally popular and combined an engaging personality with a high degree of efficiency.

Expressions of sincere regret at her departure, coupled with best wishes for her future, were voiced by all who bade her farewell. Miss Young, in returning thanks, referred to the assistance and *cameraderie* which had made her comparatively short acquaintance with the Gloucester District a very happy experience.



Murder and Mutts.

BOOM ! That means that another tree has fallen and that they have blown up the roots. There is a "development" scheme going on and a lovely wood is being cleared. Tree after tree has been felled and no one seems to care. All I can do is to sit by sadly and write a perfectly useless epitaph. The wind has played a requiem and has sobbed itself into silence ; the rain has streamed in sympathy and the pools are its tears ; the snow has laid its soft mantle as if to hide the gaping wounds. The trees have been outraged and murdered.

Trees are friends and these were mine. I have wandered amongst them. They have brought joy and hope in Spring, they have sheltered with their generous shade in Summer, their rich glow has warmed my heart in Autumn and in Winter their bare branches have pointed me outwards and upwards. I have stood beneath the larches as they swayed in the wind and I have fancied that the earth was a ship swinging gently on the sea and that the fleecy clouds were chasing billows. I have walked reverently along aisles of beeches whilst the soft light played through the leaves. I have stolen shy glances at the dainty birch as she shook her silken robes around her and I have worshipped the majesty of the oak and the cedar.

Now they are prone and dismembered, torn asunder, stripped—yet, even so, noble in death. Some few are left like captives to grace the gardens of the men who shall come after—and they bear the mockery in silence. Boom ! Another has gone. Oh, Damn !

Soon there will be pavements instead of a carpet of green and gold, the sweet breath of the brown earth will be stifled because of the bricks piled upon her bosom, and the wild riot of form and colour will give place to straight lines and correct crescents. Then the men will say, "See, we have developed our estate : let us make it even more beautiful. Let us plant little plane trees along our streets—one tree every few yards at a pace in from the kerb—and let us protect them with a stout stake and a cage of wire mesh. Let us alternate them with graceful lamp-posts of iron." And they will rub their hands and say, "It is good."

So will they plant trees amongst houses instead of houses amongst trees. Aren't men mutts !

PERCY FLAGE.

A Happy New Year.

Greetings to readers far and near. We wish you all a glad New Year. May 1929 display its treasures each successive day—good health, much wealth, and many friends ; may fickle fortune make amends for past reverses, and, in lieu, may joy and gladness come to you. And those who've added to our page a glamour—namely, Percy Flage (or Flahge !) and "G.M.T." and those who've written us in verse or prose, we thank with gratitude profound, and o'er and o'er their praise resound.

Oh, may the Provinces repent the very meagre copy sent, and may exchanges everywhere contribute each a monthly share, and make our column, wide and far, welcome as other columns are. Good luck, good fortune, all success are wished you by the Editress.

My Dreams.

I dream of the day I met you—
I dream of the light divine
That shone thro' your milk-white opal
When first I took your line.
I dream of the number you gave me
In tones like a soft caress,
And how you politely thanked me
When advised it was T.O.S.

I dream of the words you whispered
When I answered your calls each day—
And how I at times responded
When the Super. was far away.
You never were cross or impatient
No matter how sorely tried,
But calmly endured wrong numbers
And when "cut off" merely sighed !

Alas ! alas ! I have lost my Sub.
In the automatic fray—
And only a few poor fishes remain
On my board to-day !
But I dream of your voice and courtesy rare
And though your new dial I hate—
I shall love you the same for ever
As long as I serve the State !

C. A. S.

Contributions to this column should be addressed : THE EDITRESS, "Talk of many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

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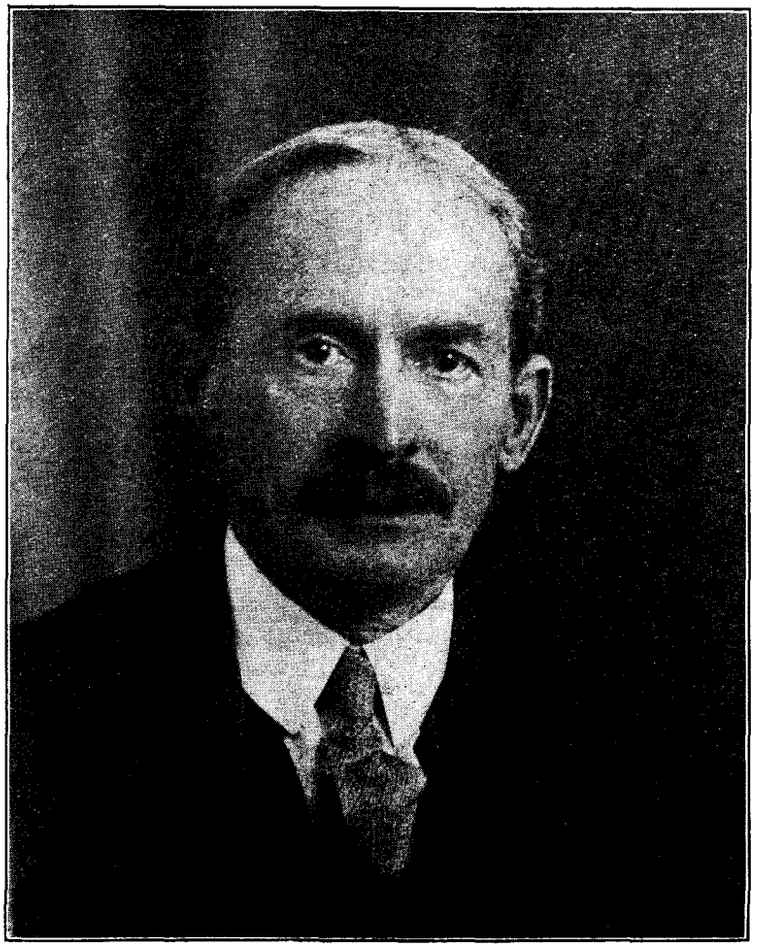
TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXI.—MR. D. M. FORD.



MR. DAVID MILNE FORD, the Deputy Controller of the Central Telegraph Office, commenced his career as a Telegraphist in 1885. In June, 1897, he gained by competition a Third-Class Clerkship in the Controller's Office, C.T.O., was promoted to the Second Class in 1904, to the First Class in 1914 and to a Principal Clerkship in 1918.

Mr. Ford's capacity for work was early recognised and his ability and thoroughness always manifested themselves in everything he undertook. On his transfer to the Instrument Galleries in 1919 as Chief Superintendent, his previous experience and his administrative training stood him in good stead. He quickly showed that he possessed not only higher supervising ability but administrative ability of a high standard, and he was promoted to Assistant Controller in 1922. Continuing in this capacity until 1927, being in charge of the Provincial Gallery for the greater part of the time, he succeeded Mr. Stuart Jones as Deputy Controller in June of that year.

A keen telegraph man from the time he entered the service, when the Morse system was the mainstay of telegraphs, he has seen that system largely replaced by machine telegraphs and has done much to encourage and develop the change. Possessed of admirable foresight, an efficient mind and tact in dealing with staff problems, he has all the qualities of a good administrator, and the C.T.O. is fortunate in having him as Deputy Controller.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

I.—BY A TELEGRAPHIST IN THE CENTRAL TELEGRAPH OFFICE.

(NOTE.—*The Editing Committee accept no responsibility for the views expressed in this series of articles.*)

THE extension of the Telephone Service, and the big commercial, social and economic changes that have taken place since the war, have each played a part in the decline of inland telegraph traffic. They are sufficiently serious to call for radical changes in the organisation of the service. To deal adequately with such a complex problem within the limits of space laid down is impossible, and this fact forms the writer's *apologia* for the sweeping statements that must inevitably appear.

ADMINISTRATION.

To the practical telegraphist the organisation appears to be top-heavy, and the system lacks adaptability. Whilst, in a complex business such as the Post Office, it is impossible entirely to separate the administration of the various sections, overlapping and confusion undoubtedly exist. There is room for greater simplicity and a much more scientific distribution of functions. It is of the highest importance that there should be more freedom for development.

The commercial side of our craft receives scant consideration under existing arrangements. Public facilities have been decreased. The application of staffing standards too high for existing circumstances, has led to conditions that frequently entail undue delay. Unstable apparatus has been brought into commercial use without having been tested under practical working conditions—without adequate alternative arrangements in case of breakdown—and sometimes without necessary technical information being supplied to the commercial staff responsible for its adjustment. It cannot be argued that "changes" such as these increase the confidence of the public, or attract traffic. On the contrary, their effect has been thoroughly bad, and has undoubtedly accelerated the decline in traffic.

The reorganisation of the Service, as a comprehensive and a more autonomous unit under a Director of Telegraphs, possessing reasonable latitude regarding future developments, would remove many difficulties that now exist. It should be his duty to direct the Telegraph Service along modern scientific lines. With adequate publicity and canvassing staffs existing services could be popularised, extended and improved as occasion demanded, and every possible effort made to attract traffic. In short, the idea is the creation of a centralised organisation, more on the lines of a modern commercial undertaking, to direct and administer the Service, with the Traffic, Engineering and other Sections, acting in an advisory capacity only.

Information concerning Post Office accounts is scanty, but there is undoubtedly need for greater freedom of action with regard to financial matters. Whilst there may be arguments in favour of a form of Treasury control, there are many reasons why the Postmaster-General should be invested with greater authority in financial matters, since it would simplify machinery with correspondingly beneficial results.

TECHNICAL.

Considerable difficulty, mutilation and delay have been caused by the manner in which new types of apparatus have been brought into use. It is suggested that no innovations should be introduced on traffic channels until exhaustive tests have been made under actual working conditions by expert operators in the experimental rooms, and that existing channels should be maintained until the innovation has been proved thoroughly reliable, following its introduction into the gallery.

The most important aspect of all telegraph systems is manipulative efficiency, and it follows that ease and efficiency from the operating viewpoint, should be the foremost consideration in deciding upon the introduction of new types. The importance of equal touch on type-keyboards may be quoted as an example. Of all the dozens of Booth-Wilmot keyboards in use, it will be difficult to find two possessing similar characteristics. Some are stiff, others light. Some have a big drop, others a small drop. Some have a springy touch, whilst others are "dead."

From the operators standpoint the results are very unsatisfactory, as there is, of necessity, frequent change of keyboard. If this defect cannot be remedied, a more efficient type should be sought, since the output of the whole operating staff is affected.

Few problems, if any, are more difficult than that of staffing. In such a complicated business as the Telegraphs success must depend ultimately upon the enthusiasm and co-operation of the staff. Many of the most enlightened and successful employers have devoted considerable thought to the question of encouraging the development of these desirable qualities and have introduced co-partnership, bonus and other schemes with that end in view. In the case of our own craft, there has been failure to apply psychology to staffing problems. No body of men and women, whatever their rank, can apply enthusiasm to their work when confronted by a gloomy prospect of worsening working conditions —worsening holidays—worsening duties—loss of old-standing privileges—with practically no prospect of promotion, or hope of escape, to more congenial duties. The problem has already become acute, and will become more serious in the future. Modern telegraph systems call for the expenditure of more nervous energy since the whole machine moves at greater speed than in the past, thus increasing the strain. It follows, therefore, that maximum operating efficiency cannot be maintained indefinitely.

If the organisation is to attain maximum operating efficiency it will be necessary to ensure frequent movement from the top, so as to maintain the most suitable age for manipulative work. There would appear to be but one satisfactory method of achieving this, and that is to staff the clerical and administrative posts from the manipulative grades. This may sound revolutionary in some ears, but like Lord Darling's comment upon his judgment in a famous case, "the more it is considered the wiser will it seem." Some may hold that these posts are already staffed in the main by officers from the manipulative grades. There is a very big difference, however, in the scheme here suggested. At present when ambitious young people enter the service considerable time and expense are involved in training them as telegraphists. A large proportion of this outlay is wasted, since they have to pass into the clerical class just about the time they have arrived at maximum efficiency and usefulness as an operator. This would be avoided in the scheme now being advocated.

Briefly, the plan is that selection for the Telegraph Service should be a little more stringent, both as to educational ability and as to suitability for modern telegraph requirements—a point that has never received the consideration it deserves. After a period as an operator, during which time much knowledge useful in the next stage would be acquired, the officer could be promoted, say, between the ages 30 to 35, as might be possible, to a clerical post. It is not claimed that every individual is suitable for, nor would desire clerical duties, any more than it can be claimed that every person now performing those duties is happily placed. The service does contain, however, many men and women of organising and administrative ability and technical skill, who simply lack the opportunity to utilise those abilities to the mutual profit of the Department and the individual. Obviously there would have to be some method of selection, but this is by no means an insurmountable barrier. Those officers failing to qualify could be employed upon duties where telegraphic knowledge and experience are called for rather than maximum operating skill.

If a scheme on these lines were put into operation the Telegraph Service would become more of a career. Every individual entering it would feel that effort was worth while. There would be incentive all along the line, and enthusiasm would replace the blank wall that now lies across the path of those desiring to render of their best.

OPERATING.

It must be frankly admitted that specialisation does make the performance of a particular task easier. There are, however, other considerations to be borne in mind, i.e., the physical effects of monotony, mental fatigue, sense of irritation, &c., since the sending or reception of a public telegram is very different from making match boxes. A mobile staff is economic and desirable, and complete specialisation is not considered economic. Under a scheme such as that outlined in the previous paragraph a limited form of specialisation would be possible and would yield good results. The operator would know that he was not doomed to operate a Booth-Wilmot or teleprinter keyboard for the remainder of his official life, whilst there would not be the same need to conserve nervous energy, due to fear of breakdown, knowing that at the end of the operating period reward would be forthcoming by transfer to more congenial duties.

Subsequent difficulties would be avoided if more care was taken in the training of operators on the newer types of apparatus. Shortage of staff frequently leads to the suspension of practice, which is therefore not continuous, and as a consequence it is more difficult to acquire a good style. It is not uncommon for an operator after qualification of a type keyboard to be employed continuously in a division where keyboards are not used, with the result that no further experience is possible for a long period. When the individual is called upon to operate a keyboard, bad habits, such as looking at the keys, are acquired when working at speed.

It is a matter of general experience that a ten-hour duty is too long and it is impossible to maintain efficiency over a stretch of duty of that length without undue strain. Some improvement could be effected by the introduction of a definite break in each period of the attendance such as that in operation in the U.S.A.

NEW SERVICES.

The watchwords of the Telegraph Service must always be "Speed with accuracy," for without them prosperity will never come. There has recently been a tendency to get away from this interpretation of the function of our craft, and in its place to maintain an even flow of traffic, even if it entails delay. The cessation of this system is advocated and a return to the old slogan as a basis for the telegraph system.

There is undoubtedly a field for a variation of rates while maintaining the need for urgency in dealing with the ordinary telegram, as a basic principle. There are many occasions when the "Rush" telegram, on similar lines to the foreign "Urgent" telegram, would be a real benefit to the public, and the institution of such a service at double rates is suggested. This type of message should normally be delivered at any big town in the country within a few minutes of being handed in. The ordinary telegram, it is suggested, should maintain its present position at existing rates. In addition to these two types, there is need for a "Deferred" telegram at half the present charges, subject to, say, 6 hours' delay, to meet the need for less urgent business and social messages.

In addition, it is thought that there is an altogether new field for the "Advertisement," or circular telegram, which could be handed in one or more days before delivery was required, and charged for at very cheap rates—say, 50 words for 1*s.* and 2*d.* for each additional copy in the same town. This should be popular for certain types of advertiser and would bring in traffic to be sent during slack periods.

"Greetings" types of telegram have been advocated before, and there is undoubtedly a field for these at cheap rates.

The success of all these new services, and indeed the resuscitation of the Service as a whole, depends upon adequate and continued use of a keen, well-organised publicity section, who in addition to making known these and other services that might be inaugurated, would seek to educate the public in the use of the telegraphs. Canvassers should be employed—advertisements used—even talks on the wireless. Any and every legitimate means of attracting traffic should be explored. And having achieved that end—or better still, start now, *don't post telegrams.*

A last suggestion is that all telegraph offices should remain open for a period—say one hour—after the closing time for acceptance, in order to ensure that every message would be delivered the same day. It is pointed out that the railways will not issue a ticket to a passenger unless there is a train to convey him to his destination.

To sum up, the view of the telegraphist is that the Telegraph Service should be organised as a complete unit in which he or she could feel that they had a definite place and interest. It should be a service in which there was room for enthusiasm, and the team spirit. A place where there were no blank walls, but the definite encouragement of initiative and reasonable prospects of advancement to all who showed ability. From the public point of view there is a real need for an altogether different outlook in regard to the organisation and development of the service in order that the social and business needs of the community may be met.

[The next article in the series, by an S.C. & T. from a Provincial Office, will appear in our March number.]

REVIEWS.

"*Definitions and Formulæ for Students*": (1) "*Applied Mechanics*" (*by E. H. Levitt*); (2) "*Practical Mathematics*" (*by Louis Toft*); (3) "*Heat Engines*" (*by Arnold Rimmer*); (4) "*Electrical*" (*by Philip Kemp*). (*Published by Sir Isaac Pitman & Sons, Ltd. Each, price* 6*d.*)

These little pamphlets, of convenient pocket size (5½ in. by 4¼ in.), contain a collection of the most useful definitions and formulæ which occur in electrical work, heat engine work, applied mechanics and practical mathematics. The subject matter is well arranged and the printing and diagrams are very clear.

We can strongly recommend them to all those who need the information which they contain in a convenient and portable form. Students will find them especially useful as outline syllabuses of the various subjects. Anyone who can furnish the proofs of the various formulæ given in any one of these books need have no fear of an examination in the subject with which it deals.

"*The Marconi Review.*"

We have received the first three numbers of *The Marconi Review,* a monthly publication issued by Marconi's Wireless Telegraph Co., the first number of which appeared in October last.

These numbers contain the following interesting articles, amongst others, viz.: A chapter in the History of the Marconi Beam (in two parts), Discussion on Short-wave Fading (also in two parts) and Commander Slee's presidential address of Nov. 7 to the Institution of Electrical Engineers, on "The International Radio-telegraph Convention of Washington, 1927."

We should like to extend to our new contemporary a hearty welcome and to express the view that if it maintains its present high standard it will adequately fill the vacant niche which has been waiting so long for some such effort in this country.

TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—Telegraphists in the Cable and Wireless Section of the C.T.O. were among the first to obtain knowledge of the disastrous fire at Ballan, the Australian Beam station, on Dec. 28 last, and the following interesting items are culled from *The Electrical Review* and the London *Times* :—

"The costly equipment of the 'beam' wireless-telegraph station at Ballan, about 50 miles from Melbourne, narrowly escaped destruction on Dec. 28, when the roof of the engine-room was destroyed by fire. The fire-fighting equipment of the station proved inadequate, and until the arrival of the fire-engine from Ballarat, two hours after the fire broke out, little could be done to check the blaze. The fire burned for three or four hours and damaged the generators. It is understood that the transmitter at Ballan was severely damaged by fire and water, and was not expected to be available for service for some days. The temporary service was maintained through the international broadcasting transmitter at Pennant Hills, Sydney, which is being controlled by a land line, 500 miles long, from Melbourne. This station only maintains one circuit, so that simultaneous transmission to Canada and Great Britain was impossible, but the cables assisted to relieve the congestion. The British Broadcasting Corporation's proposed attempt to relay New Year greetings from Australia to listeners in the British Isles had to be abandoned because of the dislocation of the service caused by the fire."

The Governor-General, in Council, has approved of the sale to Amalgamated Wireless (Australasia), Ltd., for £39,574 of 25 Government wireless-telegraph stations, which have been operated for the Commonwealth by the company for some time past.

The *Wireless World* reports that an agreement has been reached between the Commonwealth Government and Amalgamated Wireless (Australasia), Ltd., that the company's patent rights shall be made available free of charge to all wireless trade broadcasting companies and listeners for a period of five years, dating from November, 1927. To carry out the arrangement the company has made heavy sacrifices, adds our informant, including an estimated sum of £62,500 on listeners' licences and a similar amount on valve royalties, in consideration of which the company will receive from the Government 3*d*. per month, or an average of 3*s*. per annum, in respect of every receiving licence issued. On a basis of 250,000 licences, the amount received by the company will be £37,500, or £88,000 less than was originally claimed.

Preliminary recommendations for the reorganisation of the broadcasting services in Australia have been submitted to the Federal Ministry by the Broadcasting Committee. The Ministry will in future provide all stations and equipment, and will lease the right to provide programmes to a single organisation. Class A station leases will be for three years, and it is unlikely that Class B stations will be increased in number, they being auxiliary and obtaining their revenue mainly from advertisement. The scheme is not expected to become effective for some months.

AUSTRIA.—Last month "*Massage and Radio*" were associated in the Austrian news. This month the Radio correspondent of the *Daily News* gives us the information from Vienna that Professor Siedel has discovered a happy connexion between *wireless waves and milk!* The Viennese professor states that "warm milk submitted to high-frequency oscillations will remain sweet for a month."

BRAZIL.—From more than one quarter we learn that Brazil and Peru have signed a three-year radio-telegraphy treaty by which a service will be established between the stations of Iquitos (Peru) and Cruceiro do Sul (Brazil) when the treaty is ratified.

CANADA.—*The Electrical Review* states that it is announced in Ottawa that the Commission which has been appointed to investigate radio problems and broadcasting methods consists of Sir John Aird, president of the Canadian Bank of Commerce, Mr. C. A. Bowman, editor of the *Ottawa Citizen*, and Mr. Augustin Frigon, director of the Polytechnic School in Montreal. The Commission is to visit England and Europe.

The Canadian Minister of Marine, it is also stated, has licensed 68 broadcasting stations, 32 of which provide intermittent services at low power and of purely local interest. Some 60% of the receiving sets in use are classed as urban and 40% as rural.

CZECHO-SLOVAKIA.—From an excellent source it is learnt that the Czecho-Slovakian broadcast radio-telephone organisation is building a chain of five transmitting stations to complete the very efficient service in that country. The new high-power station shortly to be erected by Marconi's Wireless Telegraph Co., Ltd., at Bratislava will be one of the largest of them, and it will serve that country in the equivalent manner to the British Broadcasting Corporation's regional stations in the British Isles.

FRANCE.—Owing to its unfortunate financial position, says *The Electrical Review*, the Montpellier Radio Club has been taken over by the French Post Office.

The Paris correspondent of the *Daily Telegraph* says that the French Government have for some time been disturbed by the draining of the rural districts of their young men and young women, who prefer the bustle of the city to the dulness of country life. Broadcasting is to be the remedy, and M. Martin, Under-Secretary of State for Posts and Telegraphs, is devoting himself to its development. He has drawn up a scheme for the establishment of three powerful national broadcasting stations and seven or eight smaller ones, so placed as to keep in touch with all the rural areas of France. By means of underground cables he proposes that these stations should be able to relay the programmes of the principal stations, including operas and plays performed in Paris.

GERMANY.—It is understood that the Germano-Argentina wireless telephone service, opened to the public in December, is operated by means of land lines from the exchange of the Transradio Company to the wireless station at Nauen, and thence by direct transmission to Buenos Aires by means of a short-wave transmitter.

Insurance against Wireless Risks!—*World Radio* announces that the Reichs-Rundfunk Gesellschaft has concluded arrangements with five insurance companies whereby free insurance against liability for accidents caused by wireless apparatus and aerials will be included, from Jan. 1, 1929, in the ordinary listening licences granted in Germany and the Free State of Danzig. The insurance will cover liability to third persons and their property to the amount of £5,000 and £1,250, respectively, the liability of tenants to landlords being included.

GREAT BRITAIN.—*Birmingham.*—At the Birmingham University Professor E. V. Appleton (of King's College, London), in a lecture on the "Electrical Structure of the Upper Atmosphere," and, according to the *Birmingham Post*, in answer to his own question, "What was the shortest wave-length which the Heaviside layer would reflect back?" made an interesting statement, which is substantially as follows: "It was thought that with waves of five metres or less the layer could be penetrated. Recently it had been found that curious echoes of wireless signals were being obtained many seconds after they were sent out. For example, Professor Störmer had heard signals from station PCJJ working on 30 metres. That revolutionary result had been confirmed by various investigators. Professor Störmer suggested that the echoes were produced by waves which had penetrated the Heaviside layer and had gone out into space and been reflected back by electricity shot out from the sun. That hypothesis was most attractive, and appeared to fit with the times at which the echoes were observed."

Blackburn.—Wireless users who have eliminators are being advised to apply to the Blackburn electricity manager concerning dangers they run with sets not properly constructed.

Bolton.—*The Times* reports that at the Bolton Borough Police Court in December last a motor engineer of Bolton was fined £5, and ordered to pay £5 5*s*. costs and to suffer the confiscation of his apparatus, for using a wireless transmitting set without being licensed to do so. Mr. F. Elliott, prosecuting for the Postmaster-General, said this offence was a serious one. The transmitting set had been used for two years, and it had taken all that time and much expense to detect the user of the call sign "ORS."

Burnley.—*Eliminators yet again!*—Certain residents at Burnley have claimed compensation for alterations of their radio receiving apparatus which have been necessitated by the alteration of the municipal electricity supply system serving their houses. Some of the claims are to be repudiated, whilst others have been referred to a Committee.

Tonteg (Glam.).—*Aerials and Overhead Cables.*—A collier, of Maesteg Grove, Tonteg, was changing an aerial wire from the front to the back of his house. To do so he had to pass it over the roof, above which ran an electric light cable bearing 230 volts.

When the wire was raised it snapped and touched the electric cable. Both he and his wife were electrocuted.

Simultaneous Radio-Telegraphy and Telephony.—*The Times* states that experiments with short-wave beam wireless with a view to proving that two or three telegraph messages and a telephone message may be sent in either direction at the same time over the same radio circuit are approaching completion. For a little more than six months they have been in progress between Bridgwater, in Somerset, and Montreal with one set of apparatus and one aerial.

The Electrical Review adds that for the purposes of the experiments the Post Office has allowed the Marconi Company to use its beam station at Bridgwater, which was built by that company for the Post Office in 1926, and is the receiving station for the commercial telegraph service between England and Canada. The experiments have been quite independent of the ordinary service, and have not in any way impeded it.

The "outcry," rather feeble, one is forced to say, at the announcement that the B.B.C. contemplated spending something in the neighbourhood of four to five hundred thousand pounds on new broadcasting headquarters, which the *Daily News* radio correspondent declares on "high authority" is to be rented by the Corporation at no less than £46,000 per annum, has petered out. Indeed, there was practically no support for such a protest in well-informed and technical circles.

The Electrician, commenting on the criticisms, says: "The technique of British broadcasting cannot be rivalled, even with our present broadcasting conditions; when the new building is put into service, however, the 'balance' of the London transmission, at any rate, will leave the rest of the broadcasting world even further behind."

The accomplishments of British broadcasting, when recorded, should surely satisfy the most niggardly licence-holder, who possibly considers that he is overcharged by his annual subscription of ten shillings!

It is perhaps well worth while to quote just a few facts concerning the work of 1928, when an aggregate of 68,000 hours comprised the programmes from 21 stations, with a total breakdown for the entire 366 *days* being less than twenty-four *hours* !

The new regional transmitter at Brookman's Park was commenced in May last, and will be the first twin-wavelength high-power station of its kind in the world. The number of listening *groups* has increased from 60 to 160, the L.C.C. and many other schools have proved its educational value while experimental use was made and is continuing with adult education in circles so wide apart in character as the R.A.F., the British Legion and in our prisons. Not least of all has the service given no less than 13,826 free licences to the blind of these islands.

Radio Pictures.—The British Broadcasting Corporation announces that an agreement has been reached with Wireless Pictures (1928), Ltd., under which the company will continue to transmit pictures by wireless until Oct. 30, 1929, instead of ceasing at the end of 1928.

Talking Kinematography.—Talking films for the home and the reception of *still* photographs on the same apparatus are made possible, it is claimed, by an invention of Mr. G. V. Dowding, which *The Times* understands is shortly to be demonstrated to the B.B.C. A projector is run at the broadcasting station, and synchronisation of all the listeners' projectors is achieved in an extremely simple manner. At the broadcasting station the play is spoken by artists watching the film, and effects and music are arranged in a similar manner.

Picture Telegraphy.—At an informal meeting of the Institution of Electrical Engineers on Nov. 26, Mr. E. S. Ritter opened a discussion on "Picture Telegraphy," which, he said, was now an ordinary commercial process. Lantern slides illustrated the different forms of apparatus, their internal mechanism, and diagrams of connexions; the Bell, Belin, Siemens-Carolus, Bart-Lane, and Marconi systems were some of those described and compared. Alternating current was generally used, as it was more easily transmitted over a telephone line, its frequency being chosen to suit the line characteristics. At present in all picture transmission some sharpness must be lost, and a photograph was reckoned to be critically sharp if the smallest dot did not exceed 5 mils in diameter. Mr. W. Cruickshank discussed the practical field for picture telegraphy, and said that for sending symbols, diagrams, or special type, the picture telegraph was easily the best; it was being used in Japan and China for transmitting documents in the 4,000 or so native characters that had no alphabet.

On Dec. 19, thanks to the enterprise of the proprietors of the *Daily Telegraph*, the White Star liner *Olympic* brought ashore at New York the first wireless pictures ever sent from land and printed on board a ship.

The pictures were received by a "Fultograph" machine on the upper deck of the liner.

Mr. Monkhouse, the wireless operator, reported that the reception was good on every day except the last, when atmospherics interfered with the artistic value of the pictures, but did not prevent reception. Experience on the third day showed that the aerial of 70 ft. might be extended, and on the fourth day out an aerial of 150 ft. was provided, with the result that reception at 2,300 miles was very good.

Messrs. Robertson and Stedeford, of the *Daily Telegraph* staff, were responsible for the mechanical side of the production and the distribution of the illustrated broadsheet to the passengers.

The Commission of the Union Internationale de Radiophonie, specially concerned with programmes and administration, held four meetings in London during the week ended Dec. 15 at the headquarters of the British Broadcasting Corporation, under the chairmanship of Mr. Oscar Czeija (Austria). Amongst other business, draft forms were drawn up for uniform programme statistics, and for the exchange of information concerning dramatic works suitable for broadcasting; special attention was given to the study of broadcasting to schools. The peculiar fact, however, is that this "wireless parliament," with its own "council" and "cabinet," has no official rights; it is a representative body working for the good of international broadcasting. It represents 20 European countries, and even countries outside Europe are associate members, as the difficulty of meeting (the Union's headquarters are at Geneva, Switzerland) prevents them becoming full members.

HOLLAND.—Having been the first European country to establish a short-wave transmitter with a world-wide range to enable her to communicate with her colonies, says *The Electrical Review*, Holland again took the lead on Dec. 6, when the Hilversum (PCJJ) station commenced weekly schedule transmissions at such times and in various languages so arranged as to be received in distant countries under the most favourable conditions.

The Dutch newspapers report, states Reuter, that, after months of discussion, the League of Nations has decided to lay down direct cable connexion between Geneva and the Dutch short-wave wireless station at Kootwijk for the purpose of broadcasting the sittings of the League.

Readers will recall that this was mentioned under "Switzerland" in the January issue of the *T. & T. Jnl.*

HUNGARY.—*A Suggestion for British Railways?*—A regular radio-telephone broadcast reception service on the Hungarian State Railways was inaugurated in November. For 6*d.* an hour hygienically wrapped headphones above every seat, including third class, excellently transmit Hungarian and foreign programmes. Headphones in the waiting-rooms at all the Budapest stations are greatly in favour, especially with third-class passengers.

ISLE OF MAN.—Submarine cable telegraph communication between the mainland and the island, which was interrupted on Dec. 24, 1928, was restored at 9 p.m. on Jan. 2.

Wireless communication with the island was, however, established on Dec. 29 by the Post Office authorities on two routes between the mainland and Douglas. A wireless-telegraph station at Fleetwood, to establish temporary communication with Douglas, was housed in the hutment barracks on land belonging to the War Office. Direct wireless communication with Douglas was also instituted from the R.E. barracks in Mason Street, Liverpool.

MALAYA.—Direct telegraphic communication in both directions between Singapore and London has been established by the Eastern Telegraph Company, thus eliminating the relaying stations.

MEXICO.—One of the last official acts of the former President Calles, says an electrical journal, was to sign a decree granting to the A.E.G. a concession for the establishment of a wireless station in the vicinity of Mexico City. The cost of the equipment is put at 550,000 dollars, and is to be refunded to the A.E.G. by the National Telegraph Lines Organisation out of the surplus which traffic with other countries will yield. The station will provide a direct means of communication between Mexico and Europe and the whole of South America. A sum of 50,000 dollars will also be expended on the station buildings.

NORTH AFRICA.—It is understood by *World Radio* that the 10-kw. transmitter constructed near the old town of Carthage, 50 km. from Tunis, will soon commence operation on a wavelength between 300 and 400 m. It is connected by means of a special land line with the studio, which is in Tunis itself. Tests on a wavelength of 1,825 m. were recently carried out.

PERU.—(See Brazil, above.)

RUSSIA.—Reuter's Leningrad agency reports that apparatus for the transmission of photographs by wireless has been received from Germany and installed in the Central Telegraph Office at Leningrad, to enable pictures and writing to be transmitted from Leningrad to Moscow by the telegraph wire and wireless systems.

SPAIN.—Reuter informs us from Madrid that the Council of Ministers approved on Dec. 21 of a scheme for the provision of a wireless service between Madrid and Cuba.

U.S.A.—It is announced that a company, with a capital of ten million dollars, says Reuter, has been formed to manufacture and sell broadcast picture receiving sets for installation in private houses. Programmes of still pictures have been broadcast from a number of New York stations for the past six months.

According to *Science*, adds the *Electrical Review*, amateur radiovision enthusiasts will soon be able to receive from 21 stations operated by 11 different broadcasters. Nine are now broadcasting, while two have their stations under construction; several others have applied to the Federal Radio Commission for authority to enter this field, but so far have neither been granted licences to operate nor construction permits.

An Important Patent Decision.—The *Wireless Trader* reports that patent litigation, which has lasted 11 years and probably cost the litigants more than £200,000, has just been terminated by a decision of the Supreme Court of the United States. The decision establishes that Dr. Lee de Forest, and not Major Edwin H. Armstrong, was the original inventor of the regenerative or feed-back circuit. The Supreme Court's decision in favour of Dr. de Forest has a special significance at the present time owing to the fact that further litigation is pending in the States on the question of Dr. de Forest's talking picture rights in the "Phonofilm" process. It is estimated that at least one-half of the radio sets now in use in America embody the "regenerative" or "feed-back" circuit, which makes the three-electrode valve an oscillator or transmitter.

A dispute which has been exercising the American radio industry for some time has been won by the General Electric, Radio Corporation, American Telephone & Telegraph, the Western Electric, the Westinghouse Electric, the International Radio Telegraph and the United Fruit & Wireless Specialities Apparatus Companies, whose opponents are the Radio Protective Association, representing independent concerns, which claims that the firms mentioned are monopolising the manufacture and sale of radio equipment. The Federal Trade Commission has dismissed the complaint, deciding that it is without jurisdiction to prosecute. The *Wireless World* reports that the Radio Protective Association will resume the attack by pressing the Department of Justice to take the case into Court.

The directors of the Radio Corporation of America and the Victor Talking Machine Corporation approved of the proposed merger on Jan. 15 last.

That well-known and much-respected scientist, Dr. E. F. W. Alexanderson, of the American General Electric Co., addressing the International Civil Aeronautics Conference in the United States, claimed to have devised apparatus which will dispatch a wireless wave from an aeroplane to the ground and, by the speed of its rebound, indicate to the airman with the aid of coloured lamps on the dashboard the height of his machine. A mechanical attachment for use at 10 or 15 ft. will indicate in a similar way when to begin landing with safety in darkness or fog.

GENERAL AND PERSONAL.—*Parliamentary Queries and Replies.*—On Dec. 11 Mr. Kelly asked the President of the Board of Trade if he would state whether regulations were making it imperative for all ships to have wireless transmitting and receiving apparatus, with at least one qualified operator and a continuous wireless watch, human or efficient automatic; and did this apply to all ships in the lighthouse service?

Sir P. Cunliffe-Lister said the present British law and regulations required all passenger ships and all ships of 1,600 tons gross or more to be provided with wireless apparatus and at least one operator; and if they carried more than 50 persons they must keep a continuous watch. Lighthouse tenders would not be subject to the requirements unless they came within one of those classes.

In reply to Sir C. Kinloch-Cooke, Sir P. Cunliffe-Lister said that he was not aware that any recent disasters at sea had been caused by insufficient wireless apparatus on British ships. The establishment of uniform standards in the matter of wireless on all ships could only be effected by international action, and the question of establishing such international standards would be one of those to be considered by the International Conference on Safety of Life at Sea, which would meet in London in April next.

On Dec. 19, Sir W. Mitchell-Thomson informed Mr. Wellock that the total capital cost to the Post Office of the four Imperial beam wireless services was approximately £242,200. There was an annual royalty payable to the Marconi Company so long as any of its patents were employed in the stations.

The Prime Minister also informed Captain Wedgwood Benn that the consent of the House of Commons will not be sought before the Postmaster-General leases the beam wireless system. The lease will be granted under the general powers conferred upon the Postmaster-General by the Post Office Act of 1908. There is no necessity to submit for approval of Parliament the details of the contract with the Communications Company in reference to the sale of the cables.

The Merchant Shipping (Convention) Act, which was passed by Parliament in 1914, but has never come into force, has been postponed for another year by an Order in Council. It is now due to come into force on Jan. 1, 1930, but in view of the fact that many of its provisions are obsolete, and of the International Conference on Safety of Life at Sea which is to be held in London in the spring, it is unlikely that it will ever operate.

Private Companies.—The Anglo-American Telegraph Co., Ltd., has declared the following final dividends: Ordinary consolidated stock £1 10*s.* per cent. (making £3 15*s.* per cent.); and preferred stock £1 10*s.* per cent., making £6 per cent. The deferred stock is to receive a dividend of £1 10*s.* per cent. for the year. These rates are similar to those paid for the preceding year.

The Direct W. India Co., Ltd.'s profit for the year ended June 30 last, after deducting income tax, was £16,184. A balance of £12,652 brought forward is added, making £28,836. After meeting the 2½%, free of tax, interim dividend, there remains a sum of £23,889, which has been transferred to the general reserve fund.

The directors of the Eastern Extension, &c., Telegraph Co., Ltd., have declared the usual quarterly dividend of 5*s.* per share, free of tax, in respect of the three months ended Sept. 30 last.

The Eastern Telegraph Co., Ltd.'s ordinary dividend of 2½%, tax-free, has also been declared for the same quarter.

The Great Northern Telegraph Co., Ltd., have also announced a dividend of 2½%, payable as from the 1st of last month.

The net result of the working of the Halifax and Bermudas Cable Co., Ltd., for the year ended June 30 last, after deducting income tax, was £31,244. To this is added £82,083 brought forward, making £113,327. An interim dividend of 10%, free of tax, was paid in February last; the balance, £108,327, is transferred to the general reserve fund. The directors propose to pay a bonus of £12 per share from the latter fund, absorbing £120,000.

The International Telephone & Telegraph Corporation have declared a regular quarterly dividend of 1½%, payable as from 15th ult. To finance the purchase of the United River Plate Telephone Co., Ltd., and for other purposes, the Corporation is making an issue of 10-year convertible 4½% gold debenture bonds. Holders of the bonds will be able to exchange them for common stock at the rate of $200 per share up to July 1, 1932, or thereafter at a higher rate.

The resolution for the alteration of the Marconi International Marine Communication Co., Ltd.'s articles of association to ensure that the British control of the company shall be maintained was duly confirmed at an extraordinary general meeting on Dec. 31 last.

For Our Advertisers.—Contracts open.—Quote full reference and apply Department of Overseas Trade, London, S.W.1.

New Zealand Post and Telegraph Department. Feb. 12.—Supply of v.i.r. wire (No. P. and T. 151/1184) (reference B.X. 4,951); also supply of dry cells for telephone work (P. and T. 151/1205) (reference B.X. 4,991). Feb. 19—Supply of bronze wire and copper binding wire (reference A.X. 7,252); also supply of 120,000 galvanised steel spindles for insulators (reference B.X. 4,948). Feb. 28—Supply of six-conductor telephone cordage (No. P. and T. 151/1234) (reference B.X. 4,990). March 12—Supply of switchboard cords (P. and T. 151/1247) (reference B.X. 5,017). March 26—P.M.G.'s Department, Melbourne—Supply of telephones and dials (schedule C. 401, reference B.X. 5,023). It is also estimated that 2,000 wireless sets will be required in East Africa during the next 12 months. Those interested should also apply to the D.O.T. as above, but quoting report of Office of H.M. Trade Commissioner in East Africa and B.E. Africa Broadcasting Company.

To the staff of the Cable Room, C.T.O., one would wish to tender sincerest congratulations on the four Assistant-Superintendent and the 20 Overseer posts which have now been made substantive. The announcement, I understand, was made on Christmas morning, a much better date than April 1!

The tributes to the memory of the well-beloved John Lee have been numerous and reveal how wide were his interests and activities.

In *The Electrician* of Jan. 18 there appeared "An Appreciation," by Sir Charles Bright, who voiced the fear of many of those who had watched how unreservedly he threw himself into every task he undertook, for, as Sir Charles writes, "Probably his undoing for this life was that he could never spare himself properly—despite doctor's warnings—owing to a profound enthusiasm for work."

Personally, it will be a lasting regret that I did not know of the City memorial service until the day after it took place.

It is not too much to say, however, that having read with the most intense feeling and sympathy an account of that "In Memoriam" held in the old church of the Grey Friars, off Newgate Street, by Mr. W. H. F. Webb under the title "Vale!" in the columns of the *Overseas Telegraph*, one has been able to visualise with eyes and mind something of the beauty and the reality of that "fine tribute," that "symbol of the memorial erected in the hearts of those who enjoyed his service and his friendship."

One would, if he could but the space is not mine, reproduce "Vale!" in its entirety, but must content myself with the four lines with which W. H. F. W. closes, thus:—

"Not wealth—not power—not all the gifts of art
Appraise the pilgrim at his journey's end:
But this alone—the tribute of the heart—
That none more nobly bore the title: Friend!"

J. J. T.

JOHN LEE, C.B.E.

PERSONAL RECOLLECTIONS.

THE obituary notice in *The Times* gives an admirable summary of the career of one of the most remarkable public servants of our time; and we who knew him well are tempted to amplify the record in order to recall John Lee in his many-sided character and give a clearer idea of the man to those to whom he is only a name.

My interest in him dates from about 1906, when I was struck by the intelligence and literary skill of the reports on telephone traffic matters which came from the Liverpool Post Office. From the late Mr. Salisbury, then Postmaster Surveyor of Liverpool, I learnt that they were the work of one of his Assistant Telegraph Superintendents, who, leaving school at the age of 14, had educated himself in classes at Liverpool University, where he was then a lecturer. He was a B.A., wrote reviews for the *Liverpool Post*, gave lectures on social subjects, and was one of the best after-dinner speakers in the city. Soon afterwards it was decided to appoint at Headquarters two Telephone Traffic Managers. For one of these posts Mr. J. Stuart Jones—now controller of the C.T.O.—was marked out by his past work at Headquarters; and we were fortunate to persuade Mr. Lee to accept the second post, although removal to London meant the loss of an income of £200 a year earned outside official hours, chiefly in journalism and lecturing in the Liverpool district. Stuart Jones and Lee became known as the David and Jonathan of the telephone service. They surmounted all the personal jealousies with which they were faced, made the local postmasters and telegraph superintendents their firm friends, and got things done with the minimum of friction and the maximum of goodwill. The present efficiency of the Trunk Telephone Service as an organisation is largely due to their energy, their thorough practical knowledge of every detail, and their readiness to experiment.

It was not easy for the Post Office to keep hold of a man of John Lee's many interests, and certainly on two occasions he all but made up his mind to retire and take up literary work.

He was a deeply interested Anglo-Catholic, a friend of bishops, deacons, and heads of colleges, a lay reader licensed to preach in several dioceses. He spoke at conferences; he wrote for the *Church Times* and edited *The Treasury*. He contributed to *The Times Engineering Supplements*, and was, I believe, later offered a regular post on the premier newspaper. He wrote two or three books himself—one as a thesis for his M.A. degree on the "Economics of Telegraphs and Telephones," and one of his latest tasks was to edit a series of books on social and industrial topics. Most of this literary and social work was done while carrying a full load of official duties; and it is difficult to see how he could have effected much more if he had given up the Post Office. Fortunately for us, he decided to remain.

In 1917, while I was temporarily absent from the G.P.O., he applied for, and obtained, the Postmastership of Belfast, an office with a reputation for serious staff difficulties. I wrote asking why he had taken this step; and he replied that he had written so much about the proper spirit and method of dealing with staff that he thought he ought to put his ideas into practice. He said he had left behind his Head Postmaster's Book of Rules, but had taken with him his Greek Testament. He later described how he was meeting regularly every section of the staff—Catholic postmen, Protestant postmen, Catholic sorters, Protestant sorters, &c., &c., learning what were their difficulties and grievances and explaining changes in regulations and routine. Lee never forgot his experiences when he was in the lower classes of the establishment, and his sympathies were always with those at the bottom. When he left Belfast to become Controller of the C.T.O. he received remarkable tributes of affection from the whole staff, including his critics. Lee made his mark also in the life of the City of Belfast. A lecture which he gave on the duty of the University to Commerce had the practical result that a large sum of money was raised to provide a reference library on commercial subjects. He took a University degree in Commerce, and encouraged his subordinates to attend university courses, especially in history and political science. One day the late Lord Pirrie—the great shipbuilder—came into Lee's room at the Post Office and said he proposed to found and endow a labour college at Belfast; and asked for Lee's advice and co-operation. Lee pointed out that such a scheme would be regarded by the Labour Party as a device for propaganda on behalf of capitalism, and suggested that Lord Pirrie should rather provide additional facilities for the operatives to attend the ordinary courses of the University.

The desire to open up the benefits of university education to the operative sections of the community led later to Lee's great scheme of affiliating the Central Telegraph Office to Balliol College, Oxford. The practical difficulties, unfortunately, proved too serious for its adoption; but it was a great idea, and a credit to Lee and the Master of Balliol.

Enough has been written to show the originality of Lee's ideas and the scope of his attainments. With these went an admirable wit and eloquence, the whole inspired with the genius of friendship and true brotherliness towards all—high and low—with whom he came in contact. He always preferred not to appear as the author of one of his schemes, but to get others to undertake responsibility and to assist them modestly in the background. He was a true co-operator. L. T. H.

THE ST. JOHN AMBULANCE ASSOCIATION.

THE Annual Competitions for the London Postal Ambulance Challenge Shield—Holders, Savings Bank Department—open to all Male Officers in any department of the London Post Office, and for the Women's Trophy—Holders, Accountant-General's Department—open to members of the Women's Branch of the P.O.A.C., will be held on Tuesday, Nov. 20, 1928, at 7.30 p.m., in the King George Hall, Caroline Street, Great Russell Street, W.C.1 (2 mins. Tottenham Court Road Tube Station). Admission by programme, 3*d.*, and a limited number of seats will be reserved at 1*s.* each.

Please all endeavour to be present and so help the P.O.A.C. and give encouragement to the members in their work.

Tickets obtainable from Miss E. K. M. Meeser, L.T.S., Cornwall House, Waterloo Road, S.E.1, and Mr. J. E. G. Rogers, I.S., G.P.O., Mount Pleasant, E.C.1, Joint Competition Secretaries; and all other Branch Secretaries.

INTERNATIONAL TELEPHONY.*

BY H. TOWNSHEND.

ONE must, I think, begin a review of the administration of international telephony by considering from an abstract and idealistic standpoint what is its theoretical object or scope; it is then easy to get down to earth again by glancing at the history of what has actually been done towards attaining this object; only by this—I am afraid rather tedious—route can one reach a viewpoint giving a perspective of the current administrative problems.

Theory.—Scope of International Telephony.

For idealism, especially about telephones, one turns naturally to the United States of America; and the best definition I know of the object and scope of international telephony can be derived from a statement which Mr. Gifford, the President of the American Telephone and Telegraph Company, made in the report of that company to its stockholders for the year 1926. Before citing it, I should remark that the American Telephone and Telegraph Company operates the whole of the long-distance telephone service of the United States and controls, by means of associated companies, three-quarters of the telephones providing local service in North America. Although, as everybody knows, telephony is so highly developed in North America, *international* telephony has been, until recently, a European product, for obvious geographical reasons; and what Mr. Gifford laid down was in fact the ideal scope of *national* telephone service. This is what he says: "The deal aim to-day of the American Telephone and Telegraph Company and its associated companies is a telephone service for the nation, free, so far as is humanly possible, from imperfections, errors or delays, and enabling at all times anyone anywhere to pick up a telephone and talk to anyone else anywhere else, clearly, quickly, and at reasonable cost." I think you will agree that this definition, which carries with it the authority of the practical experience of the head of by far the largest single telephone organisation in the world, does not fail in idealism. What is aimed at is clearly no less than the elimination throughout the territory of the United States of distance as a bar to personal conversation. No doubt the "ideal aim" of *international* telephony should be to eliminate also another bar besides distance, namely, separation by political frontiers.

Transmission of Calls,—Bell's Invention.

Since the energy which the human voice produces can only be made to carry a few hundred yards at the outside in the form of sound waves in the air, if it is to reach the recipient in a form audible to the human ear, the fundamental requirement of a telephone service—speech at a distance—which was provided in a workable commercial form by Bell's invention of the telephone in 1876, is a means of first transforming some of the energy of the local sound-waves produced in the air by the human voice into modulated groups of electric waves of the same frequency; of then conveying a detectible and recognisable proportion of these electrical waves to a distant point, and finally, of there re-transforming them or their remains into sound waves having a close resemblance to the originals successfully to deceive the human ear of the listener into thinking he is hearing what the distant speaker is saying. This conjuring trick—in which there is positively much more deception than is popularly supposed—is the province of the telephone transmission engineer; which, having defined it, I hope to succeed in avoiding. But it is, of course, obvious that it is the various methods of long-distance transmission which necessarily determine the physical and economic conditions in which international telephone service has to be administered; and I shall therefore have to refer in general terms to transmission methods later. It may be remarked in passing that, while the telephone itself—both transmitter and receiver—remains in essentials very much the same as it was 50 years ago, the methods of *conveying* small voice-frequency electrical currents from one point of the earth's surface to another have developed enormously in efficiency and, indeed, so far as long distances are concerned, have been radically transformed within the last 10 years or so. That is why long-distance telephony (and so international telephony generally) is a comparatively recent thing.

Direction of Calls.

To use the telephone to provide a public service necessitates a second requirement, viz., the provision of means of *directing* the electrical waves which silently embody each speaker's voice from his telephone to another telephone placed at the ear of the proper recipient and to that telephone only. This is not wholly an engineering problem, as you will see when we come to what is known as the person-to-person call, but of course the principle thing is the very technical business of isolating from each other the æther connexions between telephones and concentrating them in groups—called exchanges—situated at selected points, provided with means of alternative intercommunication by switching—whether by a human operator or by automatic plant. The obvious way of doing this is to concentrate the electrical waves carrying each pair of conversing voices in or round a physical channel, such as a wire or pair of wires, along which the conversation in its silent electrical stage can pass; and fortunately it happened that this was precisely the normal way in which ordinary electrical waves were handled,

* Paper read before the Institute of Public Administration on 13 Dec. 1928.

e.g., in telegraphy, at the date when the telephone transmitter and receiver for converting sound waves into electrical wave-groups and *vice versa* were invented. Thus, Bell's invention immediately provided both the two essential requirements of a *public* telephone service—at least for moderate distances. It is of interest to note that Bell himself was farsighted enough immediately to foresee the consequences of this fact. I will read what he said in 1878 (the year when the first telephone exchange in the world was opened with about 20 subscribers in the town of Newhaven, Connecticut). I am quoting Bell's words from Mr. Gifford's report, cited above. "It is conceivable that cables of telephone wires could be laid underground or suspended overhead communicating by branch wires with private dwellings, country houses, shops, manufactories, &c., &c. . . . Not only so, but I believe in the future wires will unite the head offices of the Telephone Company in different cities, and a man in one part of the country may communicate by word of mouth with another in a different place."

Wires and Wireless.

The point I want to make is that we are still developing on the lines foreseen by Bell in 1878. The enormous majority of telephone conversations are, and are likely to continue to be, carried throughout along wires, a method which vastly facilitates the problems of isolation, concentration and direction; and, although the technique of producing and handling waves of electrical length in free, or comparatively free, æther was invented 20 years or so after the telephone and has made enormous strides recently, the present position is that the use of radio—so-called wireless—for connecting telephones is, in the main, associated not with public telephone service, but with broadcasting—i.e., simultaneous communication in one direction only between one telephone and a large number of others, a use for which it has obvious natural advantages. I want to emphasise this, because people are now so familiar with the achievements of radio in broadcasting that they are apt to look at its prospects in connexion with the development of public telephone services—national or international—in false perspective, and to suppose that red tape or administrative sloth is the only obstacle preventing them from ringing up their friends "by wireless" successively at the South Pole, on board the *Mauretania* in mid-Atlantic, and on the Island of St. Kilda. (I have chosen these examples because they are at the same time quite imaginary and typical of 3 classes of actual case.) The sober truth is that in all cases an enormous *technical* gap has to be bridged between getting a voice across by radio under certain conditions and in one direction from one specially-arranged and located telephone to another, and providing a public telephone service between two areas enabling people to chat to each other from their own houses at their ease; and, in fact, in the existing state of progress, no telephone engineer would have recourse to radio for a public telephone service except to bridge a gap, e.g., over a broad ocean or a desert, across which for some reason it is not feasible to lay a cable or to construct a pole route. I will return to this later. Meanwhile, while we are still more or less in the realm of theory, I want to mention one rather obvious point because it is fundamental. While it is the technical progress in long-distance point-to-point transmission—by cable or exceptionally by radio—which directly governs the possibilities of international telephony, it must not be forgotten that the long international circuits are not in themselves sufficient to provide a telephone service at all; they can only link up the local and national systems which have been built up by prolonged and extensive technical efforts directed to solve problems partly of a different order—e.g., switching equipment; and the practical success, as distinct from the theoretical possibilities, of international telephony depends directly on the efficiency of the local and internal trunk systems of the countries so linked up. A full recognition of the implications of this fact is the first condition of successful administration of any international telephone service.

History.—Pre-war.

So much for pure theory; now to get down to practice by way of the history of the development of international telephone services. I have mentioned that the telephone was invented in 1876 and the first local telephone exchange was opened in America in 1878. On this side of the Atlantic the first exchanges were opened in the same or in the following year in several European countries. Although both local and long-distance telephony developed more rapidly in North America than in Europe, the need for international telephony on any considerable scale was first felt and first met on this side of the Atlantic, because of the comparatively small size of the European national territories and of the existence in Europe of highly-industrialised districts, often not very far apart and with close commercial relations, separated by one or more national frontiers. There has, of course, been for many years an excellent telephone service across the Canadian-United States Frontier, and more recently service has been opened between those two countries and the principal towns of Mexico and Cuba, but, speaking broadly, international telephony on a large scale has so far been a European product and, without violating a due sense of proportion, I can therefore confine the very brief illustrative summary of the history of international telephony for which I have time to the story of what happened in Europe.

Further, in order to cut this part as short as possible, I will still further confine it in the main to the services with which this country is concerned, i.e., the Anglo-Continental telephone services, premising, subject to certain qualifications which I will mention as I go on, that their history may be taken as fairly typical of the history of European international telephony up-to-date.

The British overseas telephone services are a good deal older tha nmany people think. The first one, the Anglo-French service, was opened as long ago as 1891, only 12 years after the establishment of the first telephone exchange in England, and 15 years after the invention of the telephone. The traffic rose rapidly and by—I think—1893 the service had already become the subject of a joke in *Punch* (this joke, however, contained no reference to wrong numbers). Two new cables were laid in 1897, when a circuit to Lille was also opened, and in 1904 a good many provincial centres both in France and in Great Britain were admitted to the service. By the outbreak of the War two more Anglo-French cables embodying material technical improvements had been provided.

The first extension of the telephone service beyond France was naturally to Belgium; but this did not follow for 10 years after the opening of the first line to Paris. In 1897, when the London-Lille circuit was opened, there had been a project to prolong it by Continental land-lines to Brussels, but eventually a direct Anglo-Belgian cable was laid in 1901. It proved a failure, but another one was successfully laid in 1902 providing two circuits. By the outbreak of the war a second cable had been laid, and proposals were on hand for two more; these cables contained only two telephone circuits each.

A rather primitive service to Switzerland via France was also opened at the beginning of 1914; and an Anglo-Dutch service was projected and had got to the point at which the cable had actually been manufactured but not laid. A service with Germany was also under discussion.

It will be seen that, in the 23 years which elapsed between the birth of the Anglo-Continental services and the outbreak of war, progress had been steady but not sensationally rapid. This also represents the position on the Continent, although most countries with land frontiers had naturally succeeded in opening telephone services at least with their immediate neighbours, so that Berlin, for example, could in 1914 speak to more foreign capitals than London could.

The War.—Position at the End of the War.

There followed the four war years. During this time, of course, no progress was made with the Anglo-Continental services—indeed, all the public services were suspended, although a number of new cables were laid across the Channel to France for military and administrative use. On the Continent there was, of course, a similar complete hold-up of all development except of temporary military lines—it is, however, worth noting that at least at one stage during the war German General Headquarters in Berlin could speak to Constantinople. After the Armistice, the pre-war services were gradually opened again to the public, and from the point of view of this country the position in 1919-20 was, therefore, that public service was only available to Paris, and to some towns in Northern France and Belgium. There was also a nominal and limited service to Switzerland. These services, of course, were far from representing the utmost that could be done, even had the technical limitations been the same as they were before the war. There is no doubt that, even had this been so, the arrears due to war difficulties would have been made up by progress at an increased rate. But, in fact, the technical position had entirely altered.

Post-war Progress.—Repeaters.

In the ten years since the war comparatively enormous strides have been made. The reasons for this, though of course of a technical order, have a fundamental bearing on the problem of administration. The small variations in electric current which carry telephone speech along a copper wire to its destination diminish in strength as they go on, so that normally the speech received is fainter than that transmitted. Moreover, the electric waves tend to become distorted in form as they go along, so that without special precautions the speech-sounds reproduced from them at the distant end may, even if loud enough, be unintelligible. The rate at which the strength of the received sound dies away depends primarily on the thickness of the copper wire, but is much more rapid in the case of underground or submarine cables than along an overhead circuit. Thick overhead copper wires are very heavy and expensive and this introduced a practical limiting factor as regards the development of long trunk telephone lines on land; on routes crossing the sea the length of the submarine cable was an even more important factor. The invention and development during and after the war of the thermionic valve, associated with the name of Dr. Fleming and now familiar to everybody with a valve broadcasting set, practically removed the limitation on the length of *land* lines; and the majority of trunk telephone lines between important centres are now contained in underground cables, each composed of many circuits of comparatively light copper wire. Along the cable routes are placed at regular intervals, about 50 miles in this country, repeater stations, at each of which the feeble incoming currents are magnified up again by means of a power plant and valves to their original strength. This invention, together with the development of special devices to cure electrical distortion, obviously opened up entirely new possibilities in the way of international European telephony. Reliable communication could now be had over almost unlimited distances on land. It is true that there was still a limit to the length of submarine cable over which speech was possible; but since this limit, even for multi-circuit cables, was over one hundred miles, the gap between the south and east coasts of England and the coasts of France, Belgium and Holland, and also that separating Scandinavia from Germany, had been or could be bridged, and there was therefore no technical obstacle in the way of providing a service between practically all the European countries.

Indeed, in the United States overland telephonic communication was already available over much longer distances than need be contemplated

in Europe, and it was not long before the European business communities began to remind the telephone administrations of Europe that all was not as it should be on this side of the Atlantic.

Administrative Difficulties.

The immediate problem was to arrange the necessary close co-operation between the independent telephone authorities owning and controlling the telephone systems in the various European countries. A strong movement therefore made itself felt in Europe in favour of some kind of international combination to develop European telephony; and, in spite of the great practical difficulties on account of the strong feeling left by the war, in 1923 an informal advisory committee was formed, at first including representatives of the telephone administrations of the western countries only, to study the problem. In about a year's time it was possible to bring in Germany and to form a really representative advisory committee known as the International Consultative Committee, "C.C.I." for short. Incidentally, I believe the preliminary meeting in this connexion was the first, or practically the first, occasion after the war when official representatives of the formerly combatant powers on both sides, other than soldiers and diplomatists, met round a conference table. International co-operation in communications was, of course, no new thing; the Universal Postal Union and the International Telegraph Union, with their permanent secretariats and periodical congresses, furnished obvious examples of what could be done, but there were special difficulties in the case of international telephony. First of all, in order that speech shall be satisfactory over a long underground cable, it is necessary that the whole of the cable shall be designed at the outset for the purpose of long-distance communication. That is to say, it is not, in general, possible merely to hitch an underground cable circuit on to another not designed for the purpose. Moreover, modern underground telephone cables are extremely expensive. This meant that, as things were in 1924, before two distant terminal countries could arrange between themselves for a telephone service, they had to secure the co-operation of the transit countries in between, not merely to arrange terms for the use of existing lines on the transit countries' territory, but to persuade them to construct expensive new cables, in some cases solely for the purpose of affording transit communication. In cases where the transit traffic was not likely to be heavy enough to occupy or to pay for a whole cable the transit country might have to be induced to plan the design of a cable primarily intended for its own terminal international traffic or internal traffic in such a way that some of the wires could be employed as a link in the long "through" circuits required by its neighbours on either side to connect up with each other. To give a practical example, both Belgium and Holland have spent large sums of money in laying such plant, in part specially designed to carry Anglo-German telephone traffic. The standardisation necessary to secure this obviously involves a degree of continuous co-operation between the engineers of the various countries which could not be obtained without some permanent international machinery, such as the C.C.I.

There are also, of course, certain non-technical questions requiring general international co-operation—for instance, some degree of uniformity in operating procedure is essential if delay in handling calls and confusion on the part of telephonists and subscribers is to be avoided. This is much more the case with telephony than with other forms of communication, e.g., posts or telegraphs, or than with transport, because a telephone "message" is instantaneous and cannot be handled by passing it on from a set of people in one country (doing things one way) to another set in a different country (free to do the same things in quite a different way). In fact, each individual telephone call involves specific acts of simultaneous co-operation between at least four people, the subscribers at each end and two or more operators.

Recent Progress.—Scope and Quality of the Existing Services.

The C.C.I. made rapid progress in its task. It sketched out a rough plan of the international cables likely to be required in the next few years in Europe, laid down certain principles which it recommended the individual administrations to adopt in the design of these cables—so as to secure the degree of plant standardisation required at that stage; and left it to the individual administrations concerned to digest this good advice and to go ahead—which they duly did. In three or four years the whole position was completely altered. Instead of only a few capitals of adjacent countries being able to speak to each other, the large towns in Northern and Western Europe—that is, throughout an area bounded by East Prussia, Scandinavia, the British Isles, the Iberian Peninsula, Northern Italy and Hungary (inclusive of the countries named)—have now practically complete intercommunication, and progress to the south and east is going on steadily. For example, a sea cable across the mouth of the Gulf of Bothnia to Finland was laid this summer and will shortly bring that country into the general European system. Poland has recently placed contracts for the construction of a network of land cables with the necessary international connexions to the West. Italy has an extensive cable system partly completed and partly under construction; and progress is reported in Yugoslavia. Moreover, in many of these countries the internal plant system is good enough to allow free communication over the international network to practically all the towns and many villages—this is the case in both Great Britain and Germany, to quote only two important examples.

The remarkable leap forward which I have just illustrated has not been confined to the mere geographical scope of the European international services. The quality of these services, that is, their degree of freedom from imperfections, errors or delays, has correspondingly been improved almost out of recognition. Four or five years ago speech transmission from London to Paris or Switzerland, for example, was often very poor—people had to shout down the telephone to make their voice heard at the other end, and much time was wasted in repetitions of words or phrases which reached the distant telephone unrecognisably faint or distorted. This is entirely a thing of the past. Indeed, the loudness and clarity of speech between two European places has now no relation to the distance by which they are separated—when any transmission difficulty is exceptionally experienced, it is almost always found to be due to the condition of the local line or of the telephone itself; the efficiency of the latter is in fact becoming the governing factor in the problem of speech transmission, which, as regards the international circuits themselves, may thus be regarded as practically completely solved.

In regard to errors and delays, the number of the former which occur depends mainly on the operating efficiency of the internal telephone systems of the terminal countries and as this improves, errors are becoming rarer. The delays on the international lines, which are measured by the time which elapses from the moment when a foreign call is booked to the moment when it is put through, have been reduced on most of the main routes by 50%, or even by 70 or 80%. On those of the longer routes—say, over 500 miles—which were open 3 or 4 years ago, delays of 1½ or 2 hours on calls booked in the morning were an every-day occurrence, whereas on the much larger number of such routes open now a delay of one hour on an individual call would be quite exceptional.

It is naturally encouraging to the telephone administrations which have laid out large sums in providing modern line-plant in generous quantities in order to effect these improvements in the quality of speech and the speed of service, that the volume of international telephone traffic has responded in full proportion to the increase in the effective facilities provided for the public. I will only cite two examples. The number of conversations between England and Switzerland has increased from 15 a day in 1926 to 150 a day at the present time, and is still rapidly growing. The number of conversations between England and France has increased from about 1,000 a day as recently as the spring of this year, when the service was first completely modernised, to 1,500 a day, and is also rapidly growing.

From the point of view of this country, owing to its geographical position all its international telephone lines terminate in London, and once a foreign country has been provided with a suitable circuit or circuits to London, communication can be extended to the Provinces at once in practically every case over the modern system of underground cables which has been constructed in the last five years. Since the beginning of *this* year* service has been opened between this country and Czecho-Slovakia, Gibraltar, Hungary, North Italy, Luxemburg, Portugal, the Saare Territory and Spain. On the other hand, the sea crossing presents special difficulties, and, in fact, technical progress with submarine telephony is not yet so advanced as with land telephony, though rapid strides are being made. In both developments, British Post Office engineers have taken and are taking a leading part. The story of the scientific progress is extraordinarily interesting; but there would not be time to go into it now in detail even if I were qualified to do so.

(*To be continued.*)

* 1928.

DEATH OF A "ROYAL" TELEGRAPHIST.

THE death of Mr. W. J. Warmington in his 80th year on Jan. 2 last removes an almost historic figure from the Telegraph Service of these islands. The official history as recorded of Mr. Warmington would be covered by but few entries. Entered G. W. R., 1865, transferred to Post Office 1870, promoted Asst. Supt. Telegraphs 1898, Superintendent (Circulation) 1908, pensioned 1911.

Actually Mr. Warmington served for many of these years as Personal Telegraphist to King Edward at Sandringham. He was actually in charge of the special telegraphic arrangements during the illness and at the death of the lamented Duke of Clarence.

He married Miss Dyer (who pre-deceased him some years ago), formerly on the immediate personal staff of Queen Alexandra, who later stood as godmother to Miss Warmington.

Mr. Warmington was consequently well-known to all the Royal family and was always singled out by the late and present King and Queen and others when visiting the C.T.O., after his permanent return to that office.

It was a gracious thought, too, that prompted our present much-tried Queen to send a personal message of condolence to the bereaved daughter of our colleague. Mr. Warmington was born to the position, courtly, gracious at all times, and unperturbed by emergencies. He naturally came into intimate contact with many of the European monarchs, and one who was intimate with him states that his home is a small museum of souvenirs he has received from the crowned heads and other high dignitaries of Europe and the East.

J. J. T.

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[This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.]

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NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

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EUROPEAN AND AMERICAN TELEPHONE CONDITIONS.

THE views of overseas critics on telephone conditions in Europe are always interesting; they are sometimes instructive. We like to see ourselves as others see us, and to learn facts which had hitherto excaped our notice. Mr. W. H. O'Brien, for instance, writing in the Chicago journal, *Telephony*, on the subject of telephone conditions in Europe and the United States, says that it is particularly noticeable that in the great City of London most business establishments close entirely for the lunch hour! We can only remark that it must be flattering to the suburban grocer and chemist to find their businesses so described. Mr. O'Brien (who is Director of Telephone and Telegraph Utilities in Boston) intends this to illustrate his contention that business concerns generally in England are unprogressive, and that whereas in America "business follows the telephone," in this country the telephone follows slowly after business. This dictum sounds very well, but what does it signify? If it means that when Americans establish an exchange in a small town they provide spare plant for anticipated development, why, this is only the usual practice of all European administrations. If it means that in the United States exchanges are built before a demand exists for them, before a town has been canvassed for orders, in the optimistic hope that plenty of subscribers will come along in the future, this is somewhat contrary to our ideas of America's scientific planning of telephone development. If it means, as probably it does, that the chief American companies draw up schemes forecasting future development and provide plant accordingly, this again is the usual practice, at least in Great Britain. But we suspect the statement is merely a rhetorical flourish.

When we come to comparisons of rates and quality of service we encounter further surprises. The writer considers that Sweden and Holland rank first and second in Europe. Both of these countries have excellent telephone services, but as regards development Denmark is ahead of Sweden, and six European countries (including Great Britain) stand higher than Holland. The rates in Sweden, says Mr. O'Brien, are comparable with those in the United States. With what rates do the Swedish rates compare? With those in force in New York, Chicago, Boston, Oshkosh or Kalamazoo? American rates vary from a dollar and a half a month with unlimited calls in the small towns, to five dollars including 75 calls in the large cities. They exhibit in different parts of the country every variation and grade to which telephone tariffs are susceptible; they differ in kind and scope in almost every town. It is important that this point should be borne in mind when instituting such comparisons, for whilst European rates are graded in a limited number of standard groups for each country, the variety of American rates is endless, and each of the numerous operating countries has its own rate policy, differing generally in each town which it serves.

Our Boston critic comes to the conclusion that Europeans have as good service as they think they need. He is under a singular delusion if he imagines the psychology of European telephone subscribers to differ so strangely from that of Americans. Few subscribers in any part of the world believe their own system to be perfect; they naturally "think they need" the best that can be contrived. Patriotism may move them to vaunt publicly the telephone system of their native city or native land to strangers, but it does not prevent them, sometimes even in America, from casting a wistful eye on the real or alleged higher standards of service in other countries.

HIC ET UBIQUE.

WE have been asked by a reader for information on the subject of the installation of small motor generators to replace the present loop batteries for telegraph repeater working.

We may say that these have been in use, particularly in America, and by some cable companies, for a period ranging up to 20 years, and that the Post Office has had them in use in the Central Telegraph Office, London, for some 12 years. Their principal advantage is economy of space, as it can readily be understood that in a large office, or even where space is valuable, such as in the City of London, the use of these machines, occupying something less than a cubic foot of space, must be preferable to secondary cells which occupy shelf space depending on voltage requirements far in excess of that of small machines. The disadvantage of the machine is that someone should be in attendance during the whole period during which they are running, and this would be expensive for small installations, but not, of course, a heavy item where a number of machines is required. It is probable that the *Post Office Electrical Engineers' Journal* will give a detailed article shortly with a description of these machines, showing their construction and the methods of connecting them.

According to the official report of the Esthonian Posts and Telegraphs for the year ending March 31, 1928, 346,000 telegrams

were dealt with during the year and upwards of 15 million telephone messages. The total number of telephone stations was 13,214, of which 4,126 were in Tallinu (Reval) and 1,196 in Tartu.

The Italian official report on telephone service as at June 30, 1928, shows that there were then 203,528 subscribers in Italy and 292,867 instruments. Of the latter, 113,087 were connected with the Piedmont-Lombardy Company's system, 72,156 with that of the Societa Telefonia Tirrena (Florence, Genoa, &c.), 33,758 with that of the Venetian Company, 31,309 with that of the Societa Esercizi Telefonici (Naples, Sicily), and 20,503 with that of the Media-Orientale (Rome, &c.).

The following incident, narrated by Mr. S. B. Gosling, Postmaster-General of the Gold Coast Government in his annual official report, gives an interesting picture of the benefit of the telephone to the illiterate native :—

The linking up with the telephone trunk service of a number of the smaller towns throughout the Colony has afforded great satisfaction to those communities.

One instance of this, which may be of interest, came to my notice during a tour of inspection when visiting a small town on the sea coast, the principal industry at which was the dried fish trade.

Soon after my arrival I was waited upon by a deputation of elderly women, who explained they represented those engaged in the dried fish trade, the ramifications of which extended to places in the far bush, even as far as Ashanti.

They were illiterate, and their trading arrangements with their agents at distant places had to be conducted through the medium of local letter writers, a system, I gathered, which frequently failed to safeguard their interests.

They informed me that they had heard that at some post offices a box was kept into which people could go and could then talk with those living in far places with whom they wished to trade. They expressed their earnest desire that such a box could be put up in their post office.

I granted their request and in due course the trunk telephone service was extended to the town.

On my next visit of inspection I found the telephone service had become the principal medium of conducting the up-country trade but the Postmaster complained that the loud voices of the women, when using the telephone, rendered ordinary business at the public counter very difficult and he had tried in vain to convince them that it was unnecessary to shout even when conversing with their client in the distant towns of Ashanti. The difficulty was overcome by transferring the telephone from the usual type of call box to a small room which also afforded greater space for the gesticulations which seem inseparable to the conversation of this class of user.

Reports continue to reach us of new overseas wireless telephone services. According to the Central News, wireless communication was established last month between Paris and Saigon, in French Indo-China. We understand that it was one-way transmission, there being no transmitting station in Saigon.

A gentleman, possibly of foreign antecedents, called recently at the Bournemouth Contract Office, when the following conversation took place :—

Prospective Subscriber : " Is thees vere I call as to a telephone ? " *Contract Officer* : " Yes, what can I do for you ? " *P.S.* : " Do you alvays keep to your advertisements ? " *C.O.* : " Yes, any we issue." *P.S.* : " Vell, I see a telephone is two and seex a veek and no charge to put in. Ees this correct ? " *C.O.* : " Yes, the rental in certain cases works out at that." *P.S.* : " Vell, I am here for two veeks but I shall only vant the telephone for von, or less than von veek, say seex days, but I am prepared to pay the full two and seex which I have here (producing same) if you will put it in at vonce, I do not want any rebate for the day I am short of the veek." (Collapse of the Contract Officer.)

THE LONDON AUTOMATIC SYSTEM.*

BY M. C. PINK, *Asst. Controller, London Telephone Service.*

(*Continued from page* 77).

FROM what I have said so far, it will be appreciated that the automatic portion of the London telephone system is now assuming considerable proportions. The patience and skill required on the part of the manufacturers and of the Engineer-in-Chief's Department in developing all the circuit requirements and supervising the erection and testing out of the apparatus will be obvious. A task of such magnitude could not be achieved without the occurrence in the early stages of many difficulties of an unforeseen character.

Apart, however, from the initial difficulties, it would, of course, be absurd to assume that a system of the complexity of the London Automatic System could possibly function without some measure of faulty working on the part of the apparatus concerned. In spite of the measures taken so far, I think it will be generally admitted that more has to be done in connexion with the matter of the results achieved with Tandem and C.C.I. equipment and in the reduction of errors arising in connexion with outgoing switching at the local exchanges. The types of errors vary at different exchanges, but the following statements show some of the difficulties experienced which lead to complaints from subscribers :—

The first gives instances of wrong displays on C.C.I. apparatus, with notes on their probable causes :—

Originating Exchange.	*Objective Exchange.*	*No. displayed.*	*No. required.*	*Remarks.*
Museum ...	Popesgrove	0887	1887	Loss of " positive " pulse.
Hampstead ...	„ ...	0632	1632	„ „
Burgh Heath	Sloane (manual).	1750	3332	Numerical equivalent for Sloane is 750. Partially set-up sender seized or ineffective cancellation after keying 1st numerical.
Not known ...	Sloane (manual).	8888	2504	Significant that combinations of like digits are used for routining. Other combinations occur, but not to the same extent.
Hop	Popesgrove	0000	1677	
Holborn ...	Chiswick ...	0000	3206	
Wallington ...	Lee Green	0000	1054	
Central ...	Popesgrove	8787	2251	Frequently, where the No. displayed bears no relationship to the No. required the former is constituted of digits 7 and 8.
Streatham ...	Popesgrove	8777	1497	
Avenue ...	Popesgrove	8877	1609	
Various Exchanges.	Paddington	8811	7740	Each digit preceded by an extra positive pulse. This particular case was the subject of repeated written complaints and is typical of pulse distortions.
Ealing ...	Sloane (manual)	1576	6576	The error in the first case represents a light negative instead of a heavy negative whilst the second illustrates the reverse condition. Many similar errors occur in practice.
Burgh Heath	„ ...	7333	5333	
Clissold ...	Lee Green	3357	3571	Numerical digits misplaced by apparent interposition of an extra pulse between code and number. Probably a faulty pulsing condition.
Hampstead ...	Sloane (manual).	0307	3072	
Clerkenwell ...	Popesgrove	8936	1893	" Thousands " digit " lost," and remaining digits correspondingly misplaced. The agent responsible for supplying the units digit is not known.
Mitcham ...	Chiswick ...	8887	1888	
Avenue ...	Ilford ...	8394	0839	
Greenwich ...	Waterloo...	4428	1442	

I should, however, mention that at some exchanges it has been possible to effect a very material improvement in the operation of the C.C.I. equipments. An example is shown in Fig. 11, where it will be seen that at Lee Green the improvement for a period was very definite and the errors are now less than 5%. Figures of this sort emphasize the value of critical analyses of the results achieved in various directions in connexion with this complicated system.

The next statement shows examples of mis-routed calls. Mis-routing is a feature which is inclined to come in patches.

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* Paper read before the London Telephone and Telegraph Society.

taken on certain switches which are in common use. As a calling subscriber lifts his receiver and so becomes automatically associated with a switch under observation, the observer receives a lamp signal. She hears the dialling tone and as the subscriber dials his call the particulars are recorded on a tape machine. The observer then hears any tones that are connected, times the various stages and receives a lamp indication when the registration condition has been set up by the answer of the required subscriber. For some time after the opening of an exchange Service Inspectors make test calls from subscribers' premises and the results of all these tests are analysed and examined. In addition, each exchange is supplied with apparatus for taking local observations in cases where individual subscribers have criticised the service. As a check on incoming service results of public calls are observed daily at a large number of exchanges. These are tabulated and studied. In addition, in the earlier stages of an exchange a special observation set is provided which can be associated with any incoming position and its related junctions. This set gives a visual indication of the number keyed by the incoming operator and connects the observer automatically to the junction allotted for the particular call under observation.

In addition to the qualitative observation of service, we must know something of the quantities of traffic handled and its distribution. I have already quoted overall figures, but for the proper control of an exchange information must be gathered from all the various types of switches. In order to facilitate this meters are inserted at various points in the equipment. A list of the various types of meters in use is given below :—

Call Counting Meters.

One per Keysender B position.
One per group of junctions connected to a Keysender B position.
One per 10 (or 5) circuits from the auto-manual board to special 1st Numerical Selectors.
One per Director.
One per 10 (or 5) 1st Numerical Selectors on junctions incoming from auto-exchanges.

Congestion Sets (one "Congestion" meter and one "Traffic-Unit" meter.

Code Switch levels	1 set per grading.
1st and 2nd Numerical Selector levels	„ „ „
Subs. R.L.S.	„ „ „
"A" Digit Switch levels	„ „ „
Coder Finder	„ „ „
"A" Digit Switch Finders	„ „ „

CHART SHOWING THE NUMBER OF BIRTHS OF GIRLS IN THE COUNTY OF LONDON IN EACH YEAR FROM 1913 ONWARDS AND THE CONSEQUENT NUMBER OF GIRLS OF 16 YEARS OF AGE AVAILABLE FOR EMPLOYMENT FROM 1929 ONWARDS.

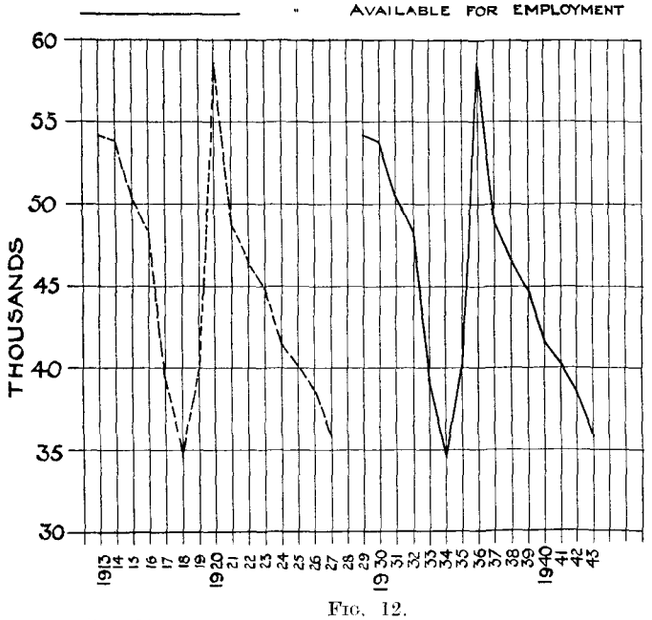


FIG. 12.

Overflow Meters.

Code Switch levels	1 meter per grading.
1st and 2nd Numerical Selector levels	„ „ „
"A" Digit Switch levels	„ „ „

Analysis Meters.

Code Switch levels	1 set of 12 for exchanges up to 3,000 lines; 2 sets for exchanges above 5,000 lines.
1st and 2nd Numerical Selector levels	
"A" Digit Switch levels	

Points at which Metering facilities are provided by means of wiring to screw type terminals.

Coders	1 Terminal for Coder.
Keysender "B" Sender	„ „ Sender.
11th Contact on P.B.X. (11-20) Final Selector levels	„ „ level of 20 lines.
Group switches (1st, 2nd and 3rd code and 1st and 2nd Numericals) ... (Not at present provided but *will be included in future* equipment.)	„ „ 10 Selectors.
Busy Back contact on P.B.X. (over 20) Final Switches	„ „ PBX group.

In addition to the reading of these meters, regular counts are taken of the numbers of switches of various types in use at predetermined intervals.

The more one has to do with the automatic system the more one is struck by the absolute necessity for the fullest possible co-operation between the various types of mind associated with the problems. The need is emphasised by the size of the following programme of exchanges to be opened before the end of 1929. It will be seen that 15 exchanges have to be completed and that their combined ultimate capacity will be more than 100,000 lines :—

Exchange.	*Date of Opening.*	*No. of Lines to be Transferred.*	*Ultimate Capacity.*
Western ...	December, 1928 ...	2,500	8,100
Beckenham ...	February, 1929 ...	900	6,414
Archway ...	March, 1929 ...	1,740	5,288
Edgware ...	April, 1929 ...	550	4,000
Maida Vale ...	„ ...	2,290	9,400
Temple Bar ...	„ ...	1,200	9,400
Reliance ...	June, 1929 ...	1,100	4,092
Metropolitan ...	July, 1929	1,400	9,400
National ...	„	1,300	9,400
Mitcham ...	„	680	2,852
Hendon ...	August, 1929 ...	1,800	4,000
Flaxman ...	„ ...	2,800	9,400
Colindale ...	„ ...	450	9,400
Fulham ...	September, 1929 ...	2,400	9,400
Hillside ...	„ ...	500	6,120

In making this review of the London automatic system I have not refrained from calling attention to some of the difficulties which have to be overcome. At the same time I want to make it clear that enormous strides have been made in overcoming the initial difficulties experienced with the system. The latest exchanges opened are giving relatively little anxiety and there is no doubt that, while it is still necessary to work for the elimination or reduction of some of the miscellaneous difficulties, it has been established that a really satisfactory service can be provided for the public. If it is generally realised that every man and woman in the organisation may be capable of some contribution to the general well-being of the system as a whole and the subscribers associated with it; and if we all have that spirit of "give and take" which must inevitably be associated with the point of view that there is one objective to aim at, one service to give, and one administration to supply that service, we shall find that we can achieve what we have many times set up as our goal for London—the best Telephone Service in the World.

In conclusion, I should like to express my grateful thanks tothe colleagues who have supplied me with material and prepared diagrams for this paper.

A CONTRACT MANAGER'S STRAY NOTES.

BY J. P. URWIN, LIVERPOOL.

TELEPHONE service saves innumerable subscribers more than the cost. Others do not find the service value for their money but find it convenient occasionally and pay for it grudgingly. Again, there are people who would like to have telephone service in their homes, as it would be convenient on occasion, and so useful in emergencies, but they cannot afford the charges.

Telephone authorities are always trying to make telephone charges as small as possible and the system of payment convenient.

There are reasons apparent to a few people apart from those employed in giving telephone service which make it prohibitive to have charges for telephone installations to cover free calls, or charges for telephone calls to cover free installations. Charges for telephone installations to cover free calls would be unfair to small users, as they would be paying for the large users' calls; and charges for calls to cover free installations would be unfair to large users as they would be paying for the small users' installations.

Many matters must be taken into account in assessing the charges for telephone installations and calls.

A peculiarity of telephone service is that the cost of a large telephone exchange averaged over the number of lines connected is considerably higher than in the case of a small exchange, notwithstanding mass production and advantageous buying in large quantities. There is no escape from this,

as communication between any two telephone users must be given by the operator without leaving her position and therefore *duplication* of apparatus for completing 'connexions' must be repeated as many times as additional operating positions become necessary.

From time to time, to equalise the work of the operators, it is necessary to record the *incidence of the calls from each user and incur engineering* expenditure for re-distributing their line terminations to operators' positions. This distribution of lines and the number of operators' positions varies *according to the proportion of each class of user, classed according to the* number of calls originated.

Another peculiarity of the telephone service is the need of provision of line wires and exchange buildings, neither more nor less than likely to be required, a considerable number of years in advance. Each user must have two wires from his telephone to the telephone exchange for his exclusive use; in other words, a "main" all to himself instead of being served from a main serving all other users as in the case of gas, water and electric lighting. The line wires are laid from the exchange years in advance and branched in various directions where people are likely to become users, allowance being made for the drift or "course" of movement and expansion of the various business and *residence centres.*

A matter of growing importance is the increasing proportion of residences and small shops with telephones where few calls are "originated." This *increasing proportion of small users lowers the average number of "originating"* calls per subscriber and therefore the telephone authorities are faced with a falling average revenue per line!

A considerable number of people would like to have telephones in their homes, who would originate, perhaps, only about 100 calls or so in a year, Civil servants among them, and in time these will adopt telephones.

A small average number of "originating" calls per line enables more lines to be dealt with at an operating position than lines with a large average number of calls.

While the revenue *per line* falls, perhaps the gross revenue *per operating position* will increase and co-incidentally, relatively less switchboard apparatus, accommodation and fewer operators will be necessary as the switchboard apparatus for connecting one line with another will be less than for large users.

Can the charges for telephones and calls be reduced in view of the falling average revenue per line? Would a reduction increase revenue in the gross in ratio to the cost of giving service?

Telephone authorities are always seeking to avoid unnecessary capital expenditure; to reduce maintenance, "operating" and working expenses generally; and to encourage the use of the telephone service.

General matters of deep concern are the character and density of the various parts of the country, the conditions in industry and commerce and the present-day conditions of life of the individual. The country is passing through days of transitions; the character and density of places are altering to the good, at the expense of other places; migration is considerable; individuals are caught in the vast and rapid changes and are living up to income.

A natural result of the quick-changing conditions now-a-days is the *increasing number of telephones* to be provided and recovered for each hundred net increase. This involves capital expenditure for a considerable margin of line wires on which depreciation and interest on capital accrue without a direct return of revenue or, alternatively, high costs of providing individual lines.

Ways and means of accelerating the development of telephone traffic:—

Advertisements humorously illustrated in newspapers, periodicals, cinemas and public places, showing the use of the telephone in various circumstances.

System of payments to meet the present-day conditions of life of the individual: coupons for monthly payment of subscription.

The volume of telephone traffic would be increased by *making street* telephones available wherever something comes to the mind about which it is desired to speak to another person, and by reducing the charges for *calls to the level of subscribers.*

Availability of street telephones which would enable subscribers to get in touch with their own places of business or homes at all times, *without going out of their way,* would enhance the value of their own installations.

Some people look upon monthly payments as being *infra dig.*; therefore, monthly payments for the telephone should be given the mark of respectability by being made general. Those subscribers who do not wish to be bothered with monthly payments might be allowed to present a number of rental *coupons at a time,* with one payment, for any period not exceeding twelve months.

Monthly payments are easier to pay out of income; they would place the telephone service within the reach of thousands who find it inconvenient to pay a large sum but pay monthly at a slightly greater cost for furniture, motor cars, &c., &c. They would cause existing telephone plant to be brought into use quickly and increase revenue considerably.

It might be reasonable to assume that every "business" telephone subscriber can afford to have a "*residence*" telephone and has one, but it is a surprising fact that the number of "residence" subscribers in the United Kingdom would be about 77% more than the present number if the number of business and residence subscribers were "fifty-fifty."

A 77% addition to the number of residence subscribers gives a remarkable figure, and if all officials and better-paid employees should be regarded as potential subscribers in addition to the employer, there is tremendous scope for telephone development in private residences apart from those occupied by people of independent means or living in *retirement.*

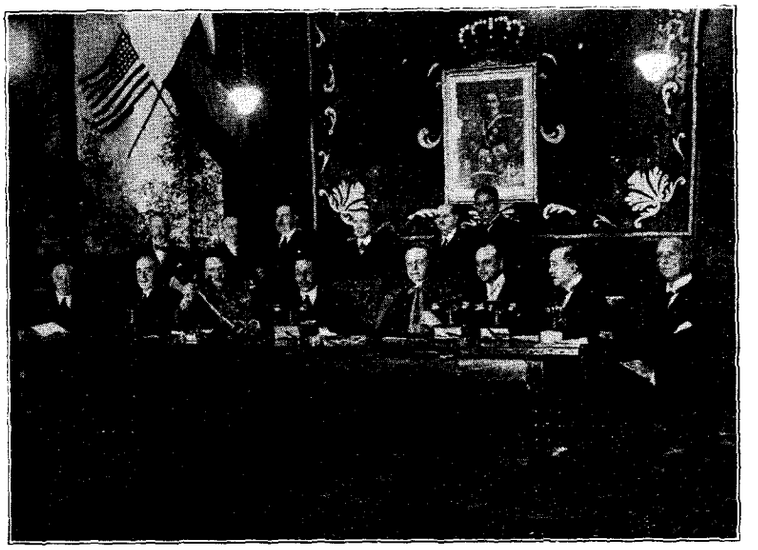
As a result of intensive telephone development in private houses, shopkeepers would require additional lines for incoming calls and few would remain without lines. This in turn would cause wholesale concerns to require more lines for incoming calls.

If telephones with a system of monthly payment were firmly established *as part and parcel of the make-up of the average home the psychological* effect would be that the percentage of users who wished to discontinue them would be reduced to the minimum.

Intensive telephone development would increase employment considerably in the many branches of work and trades affected: (Cables) lead, copper, paper, cotton; (telephone and exchange apparatus) timber, brass, iron, copper, silk, rubber, accumulators, conduits, insulators, bricks, manhole covers, excavating, machine tools, transport, lighting, coal, &c.

In certain telephone exchanges, possibly, there would be less switchboard apparatus for completing connexions (if not fewer operators) if the small users' lines were segregated and joined to a separate switchboard instead of a switchboard serving large users. Such an arrangement would involve other expenditure which might be worth while incurring.

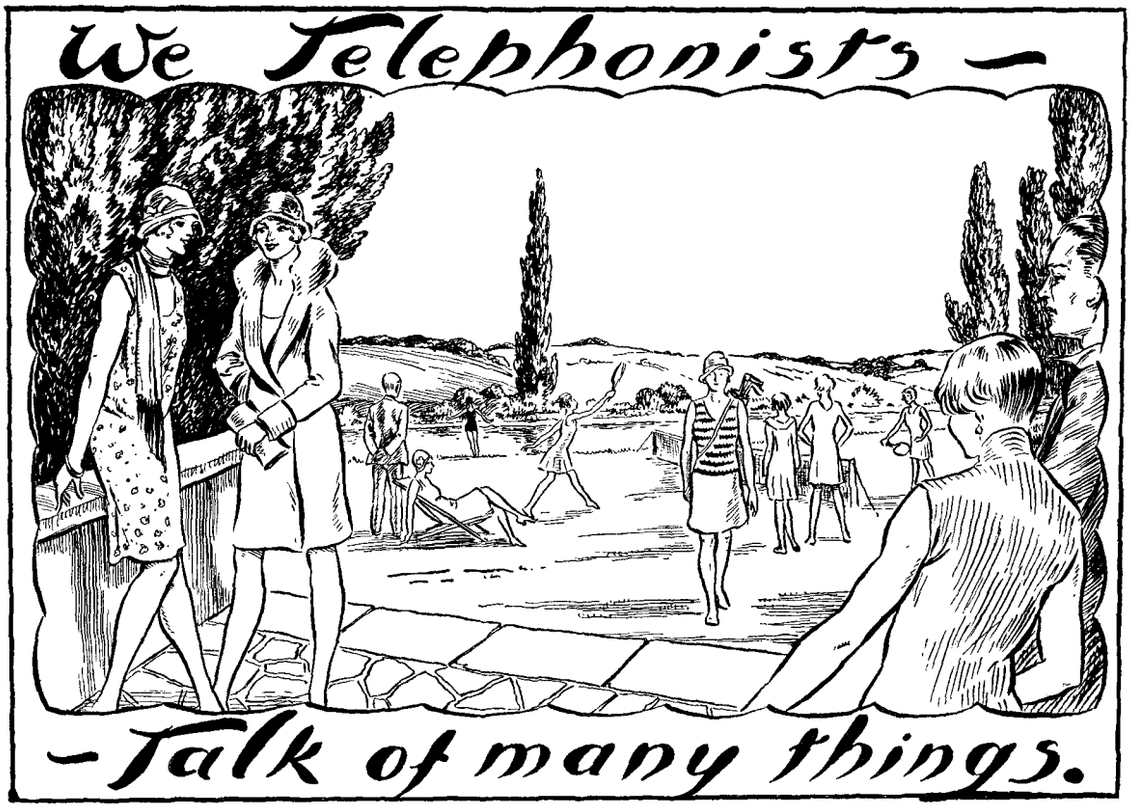
OPENING OF TRANSATLANTIC TELEPHONE SERVICE BETWEEN SPAIN AND U.S.A.



INAUGURATION BY THE KING OF SPAIN OF SPANISH-AMERICAN TELEPHONE SERVICE (VIA LONDON) AT MADRID.

Seated: (1) American Ambassador, (2) Minister of Communications, (3) Minister of Interior, (4) King Alfonso, (5) Papal Nuncio, (6) ——, (7) Marques de Urquijo, (8) Mr. Sosthenes Behn.

KING ALFONSO, MARQUES DE URQUIJO (President of National Telephone Co. of Spain) and Mr. PROCTOR (Vice-President), looking at panorama of Madrid from the roof of the Telephone Company's new building.



Musing.

DIRECTLY he stepped upon the platform I knew that he was a grocer—but perhaps I had better start at the beginning. I went to a meeting recently at which the speaker was a grocer. Mind you, I do not *know* that he was a grocer but, if he was not, he must have been a grievous misfit in whatever other calling he pursued. He looked and spoke like a grocer and he was shaped like one. His general bearing was that of a grocer, and it was only the absence of a white apron about his waist that suggested he was off duty.

I felt an unreasonable degree of irritation at the thought of being addressed by a grocer, and I remembered with satisfaction those lines of Chesterton's :—

> God made the wicked grocer
> For a mystery and a sign
> That men might shun the awful shops
> And go to inns to dine.

The words afforded me some measure of relief and I became more tolerant but even less attentive. Whilst he spoke I mused and I felt that the longer he talked the longer I should be able to muse in comfort.

Have you ever considered what an advantage it is to be able to go to meetings. Life does not offer many opportunities for musing. One cannot muse on holiday, for a holiday is a serious affair during which one must see all that can be seen, do all that should be done, and indeed live every minute of it as though it were the last. One cannot muse at length in bed or in the bath because of the soporific effect of beds, baths and musing. One cannot muse in the home. If one sits there silent and thoughtful, an unsympathetic family attributes the mood to laziness, the sulks or indigestion. Moreover, the most beauteous moments of the muse are harshly interrupted by "Tea's ready," or "Stoke up the fire," or "Let the cat in." One may not even muse after midnight because of the sleepy and oft-repeated injunction, "Oh, do come to bed." But at a meeting—and, be it whispered, even during a sermon—one may muse without hindrance. The fixed expression, the other-worldly look, the apparent oblivion to surroundings are interpreted as signs of keen interest and absorption in the matter of the moment—one appears to be lapping up the stream of words and satisfying the thirst of the mind or soul. And so, being free from mundane interruption, one can muse for as long as the speaker can speak.

So I mused upon the grocer and on grocers and tradesmen in general. After all, there was no reason why I should not be lectured by a grocer. Were not grocers in bulk quite estimable people—preferable, indeed, to many other tradesmen ? Was there not a simple dignity about them and a separateness from all the commoner forms of trade ? Their calling might almost be regarded as a profession. Their very name was unique and exclusive, and neither the name nor the calling suffered because the men who sell cabbages had aped greatness and had called themselves *green*-grocers. Their conduct in business, I reflected, was genteel. They did not blare their wares from the outside of their shops, like butchers. Their windows were tasteful displays of "sugar and spice and all things that are nice," and not garish exhibitions of the coarser kinds of food. The grocer did not call the matron "Ma," and he used clean white string and pleasant brown paper for his neat parcels.

Furthermore, I thought, what can convey a better notion of the commerce of nations than the interior of a grocer's shop. Look where you will and there is something to remind you of a far-flung empire, of distant climes, of the ocean and ships, of blue skies and blazing sun, of palms and rice fields, of strange people and tongues. One would half expect a grocer to be able to read Chinese and to sleep with a Union Jack for an eiderdown. At any moment a tea chest might open and reveal a Confucius. No shop, I considered, had such a divine scent as that of a grocer's shop—it wafts adventure and recalls those spacious days by the quiet fireside when the Romance of the East seized our childish imagination.

* * * *

I was roused to realisation by the cessation of the speaker's voice. Just what he had been saying I do not know. Possibly a grocer will never speak to me again. Who can tell what I missed ! But for whatever cause the collection was made that evening, I felt somehow that my mite was not wasted.

PERCY FLAGE.

Gerrard.

On Dec. 21 the Gerrard Swimming Club held their Annual Christmas Party.

The evening proved a great success and both Operating and Engineering staffs were well represented. We were honoured with a visit from the Reverend and Mrs. Patrick McCormick, who assisted in judging the fancy dresses. This was rather a difficult problem owing to the medley of costumes. Prizes were awarded to Miss Ormond as a captivating messenger boy, Miss Hooper attired as a Persian Princess, Miss Clover as Topsy of "Topsy and Eva" fame, and last, but not least, Miss Morris as Queen of Hearts.

Mr. E. A. Pounds, our District Superintendent, kindly acted as M.C. Mr. Keatley, as usual, provided excellent dance music, and we were further entertained with a solo dance and male impersonation by Miss Rudd.

Altogether we spent a very jolly evening and our only regret is that Christmas comes but once a year.

E. L. E. S.

London Telephonists' Society.

On Friday evening, Feb. the first, all those who have an urgent thirst for dabbling in psychology or "inhibitions" yearn to see, will have a pleasure rare indeed, for on that evening Captain Reid will lecture to us once again, just as before, in language plain. Much information we shall glean of what

our "hidden urges" mean, of what we can't, and can, endure, and many other points obscure. But first we'll meet, as is our rule, for tea inside the vastibule, at 6 p.m., then one and all will rush to gain the Lecture Hall.

Please keep that Friday night in view, and try to bring a friend with you.

Ode to Western.

Oh, welcome in new Western
To join the auto throng;
Our toll of marker pilots
Will now be hundreds strong.

Your sisters, Sloan and Holborn,
Both greet you with a smile,
And trust there'll be no wrong displays
Or trouble with your dial.

Your little cousin, Tandem,
Will key out WES for you,
If ringing tone rings out O K
Your calls should all go through.

And Monument and Mansion-House,
Our hypothetic pair,
Combined with Auntie Bermondsey,
Will auto laurels share. D. D.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

MANCHESTER NOTES.

(1) *Progress.*—The number of stations in the Manchester district at the end of December was 87,666, an increase of 4,973 on the December, 1927, figure. Trunks and telegrams dealt with were 6,482,134 for the year, an increase of 264,000 over the previous year, whilst local calls for the 12 months ended Sept. 30 (the latest figure available) numbered no less than 66,000,000, an increase of 5,000,000 calls. 133 street kiosks have also been installed during the 12 months, making a total of 380 now in use. The card system for showing particulars of installations has been introduced in place of rental registers in respect of four hypothetical exchanges, and its extension to the rest of the district will take place during the current year.

(2) *Staff Lectures.*—The series of lectures relating to automatic telephony which is being given by Mr. J. L. Parry to the Manchester Supervising Officers continues to attract large attendances. On the afternoon of Saturday, Dec. 8, the lectures were supplemented by a visit to the new Rochdale Automatic Exchange, where the installation was thoroughly examined. The party was nearly 40 strong, and the North-Western Traffic Staff, assisted by representatives of the Engineering Department, went to a great deal of trouble to make the visit a success. The visitors hope to return the compliment when Manchester's system is in a condition for inspection.

(3) *Social Events.*—The staff of the Manchester Central and City Exchanges celebrated Christmas with customary thoroughness, notwithstanding the heavy season traffic. On the evening of Dec. 19 a lively social evening was held in the Rest Room at York Street. Miss A. Wright and Miss K. Frost presided. The District Manager, Mr. J. T. Whitelaw, the Traffic Superintendent, Mr. J. L. Parry, Messrs. A. Kemp and F. Williams, Exchange Superintendents, were privileged guests. These gentlemen were the only representatives of the "weaker" sex—the ladies numbered nearly 300—but your correspondent is informed that they stood the strain very well.

The proceedings opened with the Week's Good Cause broadcast by Miss G. Laing, who made a touching appeal on behalf of the Society for the Suppression of Satirical Subscribers. At the outset there was a little trouble with the microphone, but everything went smoothly when this had been overcome. A number of clever artists presented an attractive programme of musical items, monologues and speciality dancing. A one-act Comedy Sketch, in which the majority of the characters were males impersonated by operators, brought the audience to tears (of laughter). Dancing, community singing, and refreshments, the latter at the capable hands of Misses Gregson, Finch, Smith and Mrs. Cartwright, completed the evening's diversion.

It has for many years been the custom of the staff in Central and City Exchanges to send supplies of dolls, dressed by members of the staff, and toys, to the Children's Hospital and the Ragged Schools at Christmas. This year's supplies were duly despatched on Dec. 20.

On Dec. 20 the District Manager's Staff held their Annual Christmas Dinner, at which about 90 of the staff were present. Mr. J. T. Whitelaw, District Manager, took the chair.

After dinner, all repaired to the room set aside for dancing, where an excellent Dance Band was in attendance. In the intervals between the dances Miss N. Phillips, Mr. J. M. Phillips and Mr. J. Brooke gave selections from their varied repertoires. Community singing was also indulged in, the Contract Officers forming themselves into an impromptu "choir" to give the lead in the rollicking choruses.

(4) *Retirement.*—On Dec. 31 we bade farewell to Mr. S. Johnson, and on Jan. 1 Mr. T. Hibbert terminated his services with the Department on attaining the age limit. Each of these Clerical Officers was an old National Telephone Company man and had served for 34 and 46 years respectively.

Mr. Johnson will be remembered by his colleagues who served with him in the following districts: Warrington, Barrow, Preston and Blackburn. He was subsequently transferred to Manchester about 9 years ago. Mr. Hibbert ("Tim"), however, spent the whole of his official life at Manchester and will be known to many of the old Lancashire and Cheshire and ex-National Telephone Company staff now serving in other parts of the country. "Tim" was, I believe, the oldest ex-National Telephone Company man in the Manchester district, and I doubt if there is anyone senior in point of service in the country. The official farewell was staged in the Dining Room on the dates mentioned above, when a goodly and representative company were present.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at Nov. 30, 1927, was 1,709,875, representing an increase of 13,670 on the total at the end of the previous month.

The growth for the month is summarised below:—

	London.	*Provinces.*
Telephone Stations—		
Total at Nov. 30	609,098	1,100,777
Net increase for month	6,052	7,618
Residence Rate Subscribers—		
Total	143,507	227,119
Net increase	1,862	2,449
Call Office Stations (including Kiosks)—		
Total	5,483	19,904
Net increase	33	104
Kiosks—		
Total	1,191	4,731
Net increase	33	99
Rural Party Line Stations—		
Total	—	10,347
Net increase	—	54
Rural Railway Stations connected with Exchange System—		
Total	—	1,016
Net increase	—	7

The number of inland trunk calls dealt with during September, 1928, was 8,860,088, an average of 354,404 calls per day. During the six months ended Sept. 30, the number dealt with was 54,631,310, representing an increase of 3,591,164, or 7.04% over the corresponding period of 1927.

Outgoing international calls in September numbered 34,518 and incoming international calls 37,404. In the six months ended September, 1928, 207,855 outgoing and 229,511 incoming calls were dealt with, representing increases of 52,702 (34.0%) and 63,447 (38.2%) respectively over the corresponding half-year of 1927.

Further progress was made during the month of December with the development of the local exchange system. New Exchanges opened included the following:—

LONDON—Welbeck (automatic).

PROVINCES—Bishops Stortford, Harpenden, Heckmondwike, Hipperholme (automatic), Sowerby Bridge (automatic),

and among the more important exchanges extended were:—

LONDON—Tottenham.

PROVINCES—Anfield, Bolton, Byfleet, Cradley Heath, Gravesend, Maidstone, Runcorn, St. Annes-on-Sea.

During the month the following additions to the main underground system were completed and brought into use:—

Rochdale—Halifax cable,
Bolton—Wigan cable,

while 89 new overhead trunk circuits were completed, and 97 additional circuits were provided by means of spare wires in underground cables.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of December resulted in a net gain of 2,404 stations, as compared with 2,770 last year. This decrease was entirely in the West End, and it is thought that it is mainly due to a reduction in trade due to the decrease in social and other activities owing to the King's illness.

It is interesting to note, however, that the net gain for the December quarter amounted to 15,055 stations, as compared with 13,989 last year.

There were at the end of 1928, 1,214 kiosks in London. The increase during the year was 459. There has been no rush on the part of any authority to offer sites for this public facility. On the contrary, practically every site has had to be fought for, and it has been estimated that out of every four sites considered, only one matures. In the circumstances, we might have done much worse.

The excellent little model of a No. 2 kiosk used as a biscuit box, introduced this Christmas by the C.W.S., has excited considerable interest. It is hoped that there may be a wide distribution of these models, as anything which draws attention to the real article is not to be despised, even if in the humble guise of a receptacle for the toothsome biscuit.

It is with deep regret that we have to record the death of our late colleague, Mr. F. H. Jonghmans, formerly of the City Contract Office. Mr. Jonghmans was superannuated as recently as Nov. 17 last, and died on Dec. 21. He was buried at Streatham Park Cemetery on Dec. 27, the Contract Branch being represented at the funeral by Messrs. A. E. Culpin and A. G. Mansell.

* * * *

National Sanatorium, Benenden.

The second of the series of concerts organised by the staff of the London Telephone Service was held at the Sanatorium on Dec. 29.

The artistes were: Misses Nellie Beare, Margaret Worth and Mollie Aldridge and Messrs. Arthur Hemsley, Bob Douglas, John Harris and Hugh Williams, the concert being under the direction of Miss Worth. Again the staff, patients and artistes thoroughly enjoyed themselves.

The inclusion of Miss Nellie Beare and Mr. Hemsley in the concert party was a considerable advantage, as it enabled such popular items as the quartette "A Regular Royal Queen," "The Miserere Scene" from "Il Trovatore" and the duett "Tenor and Baritone" to be included in the programme.

At the close of the concert the staff expressed their appreciation of the further kindness of the L.T.S. in providing such an excellent entertainment and Miss Worth, in responding, announced that another concert would be given on Jan. 26, 1929.

* * * *

A "Send-off" Party at Gerrard.

To mark the retirement of Miss G. Snook on Jan. 11, the Supervisors and staff organised an evening party which was attended by about 300 of her friends and colleagues.

MISS G. SNOOK.

During the afternoon Miss Snook was presented with many beautiful and useful gifts from personal friends. She also entertained to tea several who were anxious to do her honour but were unable to avail themselves of the evening's entertainment. We were honoured by the attendance of the Superintendent, F. E. S., Miss Cox, and a number of Superintendents of Traffic, including many old friends of ex-National days.

Mr. Pounds, when handing Miss Snook a cheque for £28, given by her friends throughout the London Telephone Service, commented on the large attendance of the younger members of our staff, and said "she deserves it all because she has made friends wherever she went." A bouquet of flowers was then presented and this was followed by a hearty rendering of "She's a jolly good fellow" and "Auld Lang Syne."

The Misses Longman, Cleave, Gardner, Latimer and Southon provided the musical side of the entertainment; the latter associating with her song, "Good Luck," a beautiful bunch of white heather for Miss Snook.

There was unusual excitement in the neighbourhood when a large party of Miss Snook's friends gathered round her taxi in Gerrard Street. The police moved the car on before the good-byes were said, leaving half of her belongings on the pavement. However, this was soon rectified and the chorus of hooters from neighbouring cars was successfully drowned by our young folks' voices speeding the parting guest.

We hope to see Miss Snook among us on many future occasions. For the time being we have lost a good friend and loyal colleague. Here's to her happy retirement and, once more, "Good Luck."

Miss Snook wishes to thank all her friends for their share in her testimonial and for the charming personal gifts presented to her on her retirement. She also desires to say that the presence of so many old friends and colleagues was a surprise and delight to her. To use her own expression: "It was the happiest day of my life and I enjoyed every minute of it."

* * * *

Football Notes.

The month of December was a bad one for the L.T.S. football team, as both league matches were lost, in addition to the Challenge Cup tie. It is the second year in succession that the Ministry of Pensions have been our opponents in the first round of the Cup, and we have suffered defeat on each occasion.

It was perhaps unfortunate that we had to sacrifice the luck of the draw which gave us choice of ground, and had it been possible, the game would have been played at Chiswick, but as no pitch was available we were forced to transfer the venue to Acton, where we invariably suffer defeat.

There are many interesting matches down for decision in the latter half of the season, and a return to the form displayed during the first three months should enable us to finish up in the top half of the table.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 68.)

1877, April 2	Bell telephone tried for the first time on a New York—Boston wire.
	Charles Jasper Glidden obtained the first telephone subscriber in the world at Lowell, Massachusetts.
1877, May ...	Telephone exchange established in Boston, U.S.A.
1877, June ...	Colonial Conference held at Sydney to consider the improvement of telegraphic communication between Australia and other parts of the globe.
	Professor Hughes discovered that, if two conducting bodies lie in loose contact and a current flows through them, there will be resistance at the point of contact, and their vibrations will vary this resistance in exact ratio to the cause producing the vibrations.
	Samuel Alfred Varley constructed a telephone receiver in which the charge and discharge of a condenser reproduced sounds and speech.
	Garnier and Pollard improved Varley's apparatus and produced a carbon transmitter.
1877, July 7 ...	Emile Berliner, of Boston, patented a carbon telephone transmitter which contained an induction coil.

1877, July 20 — Edison patented a telephone transmitter with a diaphragm coated with platina foil against which pressed a spring, the point of which was faced with compressed plumbago. When the diaphragm vibrated it caused a variation of pressure on the plumbago point and a consequent variation in the resistance of the circuit. Inspired by his own and Graham Bell's experiments with the telephone, Edison invented the phonograph. The sounds were recorded on tinfoil.

1877, Sept. ... — Sir William Preece, Chief Electrician to the Post Office, recommended that the Department should secure the right to use and manufacture telephones.

1877, Sept. 29 — Col. Reynolds offered to exhibit Bell's telephone to the Post Office, but the proposal was not accepted. Later in the year, Fischer and Preece visited America and, on their return, suggested that encouragement should be given to examination and trial of the apparatus.

Preece exhibited a modified Bell telephone receiver at a meeting of the British Association at Plymouth.

Baudot telegraph system adopted by French Government.

Bright completed the series of cables connecting the various West Indian Islands.

Telephones first used on private wires.

1877, Nov. 20 — A. G. Bell patented a system of metallic circuits for telephone working.

1877, Dec. 14 — Werner Siemens patented a telephone receiver.

E. Sacher, of Vienna, measured the effect of induction in telephone circuits.

Kerr showed that a ray of polarised light is rotated by reflection at the end or side of a magnet.

18,000,000 Money Orders issued with value of £27,870,000.

1878, Jan. 1 ... — Commission for small Money Orders raised to 2*d.* for ten shillings and 3*d.* for £2.

Charge for registration of letters reduced from 4*d.* to 2*d.*

Registration fees for Inland and Foreign letters reduced to 2*d.*, and liability admitted up to £2. Special Registered Letter envelopes introduced. Number of registered letters reached 7,000,000.

1878, Jan. 14 — Prof. Bell and Col. Reynolds were presented to Queen Victoria at "Osborne House," Isle of Wight, and, assisted by C. Wollaston exhibited the telephone and exchanged conversation with Cowes, Southampton and London.

1878, Jan. 22... — Portion of a debate in the House of Commons telephoned to the *Daily News* office in Bouverie Street, London.

1878, Jan. 28... — First commercial telephone exchange opened at Newhaven, Connecticut, and a directory of subscribers provided. The Exchange was first opened from 6 a.m. to 2 a.m., but in March arrangements were made for attendance throughout the twenty-four hours.

1878, Feb. ... — Post Office asked Treasury for permission to hire telephones from inventors and supply them to private wire renters.

Bell Telephone Association dissolved, and the Bell Telephone Company and the New England Telephone Company formed.

Merritt Gally, of New York, introduced the "message by message" multiplex telegraph system, and a "differential telephone."

William Tegg published his work on *Posts and Telegraphs.*

Joseph Henry died at Washington.

1878, May ... — Hughes introduced a carbon pencil microphone.

1878, June 14 — First English telephone company registered under the title "The Telephone Company, Limited (Bell's Patents)."

1878, June 15 — Edison patented a carbon telephone transmitter.

1878, Aug. 7 — Treasury granted request made by Post Office in February.

1878, Aug. ... — Francis Blake, assisted by the American Bell Telephone Company, produced a practical telephone transmitter.

1878, Sept. 16 — Rev. Henry Hunnings, of Yorkshire, patented a granular carbon telephone transmitter with a platinum diaphragm. Mr. Edward Cox-Walker collaborated in its production.

(Bayley, of U.S.A., Berthon, D'Arsonval, Dejongh, Dolbear, Hickley, Mechalski, Roulez, Theiler and the Western Electric Co. devised telephone transmitters in various forms.)

Cox-Walker devised a telephone receiver with mica diaphragm and stirrup armature.

Stanhope devised a telephone receiver with a small iron disc fixed to a parchment diaphragm.

A. T. Collier, of Sydney, N.S.W., constructed a telephone receiver with two diaphragms the vibrations of which were projected through one opening.

Siemens and Halske introduced a telephone receiver containing a horseshoe magnet and a means of varying the distance between the diaphragm and the magnet.

1878, Oct. 4 ... — S. A. Varley patented a telephone transmitter of the Hughes microphone type.

Telegraph Act gave Postmaster-General full wayleave rights over railways authorised after Jan. 1, 1878.

International Postal Union, in Paris, dealt with Money Orders and insured articles.

German Post Office, at Congress of the Postal Union held in Paris, raised again the question of passing letters with declared value. Arrangement adopted as subsidiary and optional.

1878, Nov. 1 ... — Bright introduced an automatic printing telegraph using perforated paper tape for transmission and a typewheel for reception.

Hughes described to the Royal Society a transmitter which he called a "microphone."

Edison introduced his loud-speaking telephone.

John Matthias Augustus Stroh fitted clockwork to Edison's phonograph.

1878, Nov. 11 — Edison's telephone transmitter tried on a telegraph line between London and Norwich.

Edison invented the electric pen-writing telegraph system.

(Jordery and J. H. Robertson also devised writing telegraph systems and an apparatus named the "Telautograph" or "Telewriter" was introduced.)

Paul La Cour and Lord Rayleigh, working independently, invented the phonic wheel.

Rayleigh also devised a method of measuring electromotive force. Streets lighted by electricity for the first time. Jablochkoff candles used in the Avenue de l'Opera, Paris.

Edison devised an electric lamp in which the filament consisted of a platinum spiral.

Metzger experimented in connexion with electrical accumulators.

Quadruplex telegraph working introduced in Postal Telegraph service.

Average annual number of letters passing through the Post Office—974,000,000.

1879, Jan. 20... — Blake telephone transmitter patented in the name of William Robert Lake.

Bell invented the Membrane Telephone receiver, the diaphragm of which was composed of goldbeater's skin.

Bell and Tainter devised the "Photophone" in which they took advantage of the fact that the resistance of selenium is affected by light. They also produced the "Radiophone" in which heat waves were utilised.

A. B. Bach devised the "Resonator."

Gower patented a telephone receiver with a semi-circular permanent magnet. A flexible tube conveyed the sounds to the ear.

1879, Feb. 1 ... — Louis John Crossley's carbon pencil microphone patented.

Blakey and Emmott introduced a telephone switchboard on the Umschalter principle.

L. B. Firman fitted multiple telephone switchboards in the Chicago Exchange.

Count du Moncel published his work, "The Telephone, the Microphone, and the Phonograph."

1879, Feb. ... — Bright patented a series of improvements in telegraph relays.

1879, Mar. ... — Edison produced a telephone receiver known as the "Chalk receiver," "motograph receiver," or the "electromotograph."

1879, Mar. 12 ... — Hughes invented an induction balance. In a paper read before the Society of Telegraph Engineers and Electricians he suggested the twisting of two wires to obviate induction.

David Brooks, of Philadelphia, introduced underground cables, the conductors of which were insulated with mineral oil. He also used blown glass insulators for telegraph poles.

(*To be continued.*)

THE

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CONTENTS.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXII.

MR. H. J. LENTON.

Photograph by Harris & Ewing, Washington.

WE break new ground this month in presenting on this page the portrait of Mr. H. J. Lenton, the Postmaster-General and Secretary for Telegraphs of the Union of South Africa, and hope thereby to establish a happy precedent for widening the field of our series of Telegraph and Telephone Men. He is no stranger to this country, as he represented his Government at the Imperial Wireless and Cable Conference held in London last year. Prior to that he was the chief South African delegate at the International Radio Conference in Washington, U.S.A.

Mr. Lenton was originally in the Telegraphs, but early in his service was transferred to the Secretariat, and has been in the Administration for nearly thirty years. He passed through various grades in the Secretary's Office before reaching his present position, and in doing so gained an unrivalled knowledge and grasp of Departmental affairs. He was appointed Assistant Secretary in 1923, and while in that position was the first Chairman of the newly-formed Post Office Departmental Committee, the nearest approach to Whitleyism in the South African Civil Service, and much of the success of this body may be attributed to the lead given by Mr. Lenton, and the good tradition set up under his chairmanship. Since he became Postmaster-General in 1926 his administration has been characterised by the same broad outlook.

The reversion to penny postage and the introduction of new services and facilities has led to great expansion and development in every sphere of Post Office activity in South Africa, and with the still greater development of a growing country it is certain that Mr. Lenton will keep well abreast of all that is best in modern administration. Mr. Lenton is also the Government representative on the Directorate of the South African Wireless Company, Limited, the Company which operates the Capetown terminal of the London—South Africa Beam Service.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

II.—BY A SORTING CLERK AND TELEGRAPHIST AT A PROVINCIAL OFFICE.

(NOTE.—*The Editing Committee accept no responsibility for the views expressed in this series of articles.*)

WHILE it is an undoubted fact that the findings of the late Committee, appointed by the Government to enquire into conditions in the Telegraph Service, have revealed a rather unsatisfactory state of affairs, it is equally true that the suggestions put forward for its improvement have fallen far short of providing measures in the nature of a remedy. This is scarcely a matter for wonder. Conditions governing the telegraph service are peculiar to that service alone, and it is unfortunate that the opinions of individuals, whose interests are not only bound up in its practical side, but who have, in the main, a keen desire for its future well-being, were not more in evidence.

To be of service, either socially or commercially, a telegram must reach its destination as soon after being handed in as possible, and in addition must be transmitted with absolute accuracy. The Post Office has also to consider how this is to be done with a due regard to economy. Economy, however, must not be carried beyond a certain point, otherwise efficiency will suffer. These facts must be borne in mind if any real attempt is made to improve the present service.

It is questionable if the telegraphs, even with the most rigid economy, can ever become a really profitable proposition. This has been admitted by more than one authority. The depressed condition of trade since the conclusion of the war, coupled with the incidence of cheaper telephonic facilities, has had a serious effect upon telegraph traffic, and has introduced a further complication of the problem. The number of non-users of the telephone must, however, still be considerable, and it is not outside the bounds of reason to suggest that, by a slightly cheaper service for short-distance messages, a large increase in traffic would result, and that the volume so obtained would show a profit.

There is a prevailing impression that the telegraph service is slow, and its weakness in this respect has frequently been exposed by correspondents in the columns of the daily press. The fostering of this impression is bound to do incalculable harm. A member of the public who handed in a telegram at midday at the counter of a large provincial office for a destination not a hundred miles away, asked the counter clerk in all seriousness if his message would be delivered the same day. The address was not out-of-the-way, and there was no notice of an interruption of communication. The answer is not reported, but it should be possible for any counter clerk to give an assurance that any message to a normal address would be delivered within, at the very most, an hour's time. Where alleged cases of delay or mis-treatment are reported in the daily newspapers a thorough enquiry should be undertaken, and when explanations which may exonerate the service can be furnished, these should be published in the same columns. The silent contempt with which accusations and charges of all kinds against the Post Office are treated only serve to convince the "man in the street" that there exist good grounds for such complaints.

The confidence of the public must be regained, and that by the extensive advertisement of a speedier and more efficient service. How can a speedier service be attained? It is suggested in some quarters that what is needed is a greater output per operator. It has been shown that in comparison with the telegraph service of another country the output in the home service is smaller than it ought to be. Unfortunately, a comparison of the conditions under which the respective outputs were obtained has not been supplied.

For a considerable period the telegraph system in this country has been in a state of transition from Morse to machine apparatus, and even at the present moment it cannot be said to be completely stabilised. On circuits of primary importance Morse has in turn given way to Systematic Wheatstone, Baudot and Autoplex. On those of secondary importance, Morse has been replaced by the Morkrum teletype, and this, after extensive experimenting, has been ousted by the Creed teleprinter. Neither apparatus nor operators have been given a fair chance. From the results obtained and the experience acquired it should now be possible to select the best all-round systems and adopt them as standard.

Of those mentioned there are two which would appear to to have claims in this direction, the Baudot for a primary circuit, and the Creed start-stop for the others. The Autoplex, though capable of dealing with a higher output, undoubtedly causes a tremendous strain upon operators, while its greater proneness to faults, and consequent inaccuracies, renders it unsuitable for general adoption. It is a more costly instrument to install, and it is questionable if, taking everything into account, its higher rate of speed compensates for its disadvantages in this and other directions. The general use of the Morkrum appears to have been discontinued. This is a move in the right direction. Experience shows that the Creed is a more reliable piece of apparatus and, notwithstanding a slight weakness in some parts of its construction, its adoption on all circuits with a medium traffic return would be generally advocated. The introduction of the three (or more) stations Baudot may be defended on the ground of economy, but it should not be forgotten that it has tended to multiply the risks of stoppages, and consequent delay to traffic.

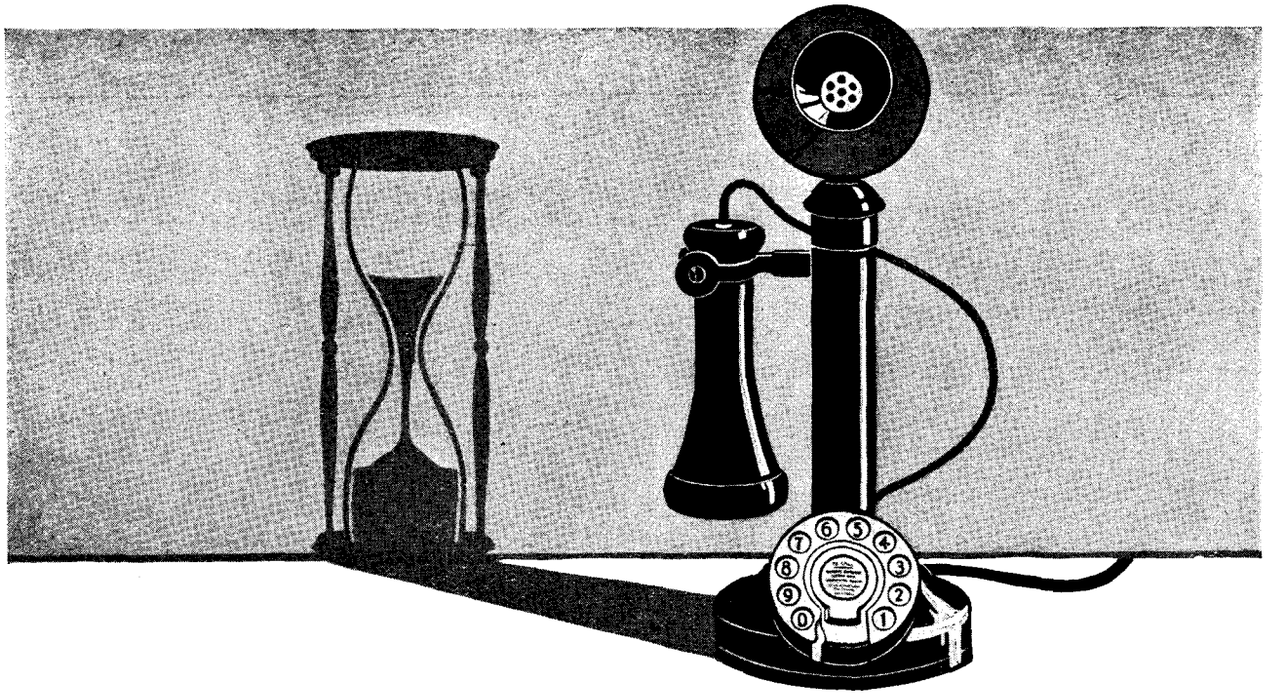
It is of the utmost importance not only that should there be qualified Dirigeurs in charge of such circuits, but each should be thoroughly expert. A breakdown at one station not infrequently means the collapse of communication between the three. Dirigeurs should receive a sound training not only on the theoretical side but also in all departments on the practical side. The present course of training is too short from this point of view to be of any value. Greater attention should be paid to the speed of running of the distributor, and in this connexion it would be advisable to standardise one type of reed. At present, about five different types are in use in a large provincial office, and as each type is known from experience to have certain peculiarities of adjustment, the difficulty of regulating speed is thereby increased.

The introduction of the underground has no doubt led to almost perfect stabilisation of line communication, but it has also tended to create small technical troubles which are not easily identified, and which frequently cause stoppages of some duration until rectified. As these are more commonly observed on duplex circuits, unidirectional working (sending on one arm, receiving on another), should be adopted in preference to working one arm duplex.

Similar arguments hold good in the case of the Creed teleprinter, and in this case operators should be given a thorough training in its technical details as well as operating. Like the Baudot, it should be worked under simplex conditions wherever possible. To obtain the best results from the teleprinter its operators should be kept in constant practice, but too long spells of duty should be avoided.

The policy of the Department to increase the proportion of women to men having become operative, it is probable that in a short time female operators will be largely employed at all important circuits. It is therefore a matter for serious consideration whether the present method of their employment should be continued.

Efficient working cannot be expected from operators unless they are fully employed at their own work. Telegraph operating and postal work are in their nature as wide apart as the poles, and



SAVING HOURS

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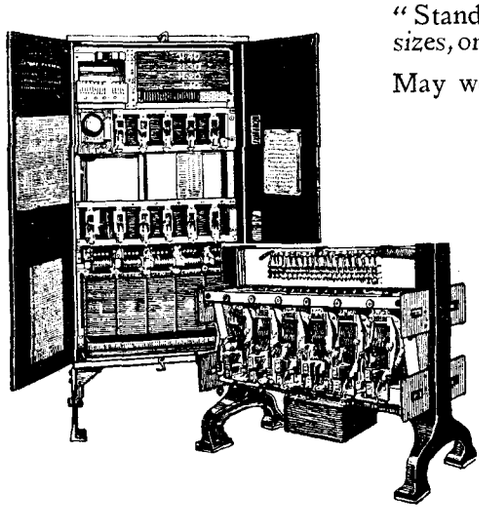

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GLASGOW, LEEDS, BIRMINGHAM, MANCHESTER, LIVERPOOL, DUBLIN.

if female operators are to have a fair chance their employment on Branch Office work should be curtailed. The necessity for the Sorting Clerk and Telegraphist in all large offices has passed and the whole matter should be reviewed in the light of present-day experience.

There is a tendency to lay too much stress on administrative and writing work in the telegraph service to-day. The promotion on the manipulative side of officers whose qualifications in other directions may be on a par, but who have more experience in writing work, in preference to those who have devoted their attention mainly to the technical side is a seriously disturbing feature of the modern telegraph service. Such a policy tends towards the elimination of interest in the development and improvement of telegraph apparatus, whereas every encouragement should be given to foster and intensify that interest. While it is admitted that qualities of a highly exacting standard may be necessary in regard to administrative and clerical duties, it is equally necessary to have these qualities plus an efficiency in technical matters for the performance of supervising duties in an instrument room. The introduction of machine apparatus into the telegraphs has created a new standpoint in reference to promotion, and this important fact should not be overlooked.

The downgrading of testing work would appear to be another retrograde step when it is considered that the test-room is the nerve centre of the whole telegraph structure. The importance of having a thoroughly efficient officer in charge of this branch cannot be too strongly emphasised. There is a great responsibility attached to the work and position and remuneration should be more in keeping. The maintenance of line communication is not the only factor under his control, but he is also responsible for the efficiency of all the apparatus attached to his office.

A point which must not be omitted is that of the relationship between staff and traffic, but until the system of machine telegraphy has been properly established attempts to create rigid staffing standards will inevitably result in failure. As a result of the present standards, which would appear to have been based on an ideally perfect system and are not sufficiently elastic, staffs have been reduced to an extent that the slightest increase of traffic means an abnormal delay and causes a state of confusion.

This is the position in the service to-day, but the situation is not beyond redemption, and if only the authorities responsible tackle the problem in a fair and broadminded way, there is every reason to hope that the British telegraph service will regain some of its former prestige and lay claim to be regarded as "second to none."

[The next article in the series, by an Overseer at the Central Telegraph Office, will appear in our April number.]

THE G.P.O. PLAYERS' DRAMATIC SOCIETY.

AN original play is always a great event in the life of an amateur society. The G.P.O. Players are fortunate in being able to announce as their next production "Jugged Heirs," an original comedy, to be produced by the author, Mr. H. Hodgson-Bentley, the founder and director of the Southend Repertory Co.

It will be remembered the G.P.O. Players were the first to perform Mr. Ralfe Davies' "Thomas More," and evidently Mr. Hodgson-Bentley, who acted as producer on that occasion, was so impressed with the performance of the company that he feels that a composition of his own will receive appropriate treatment.

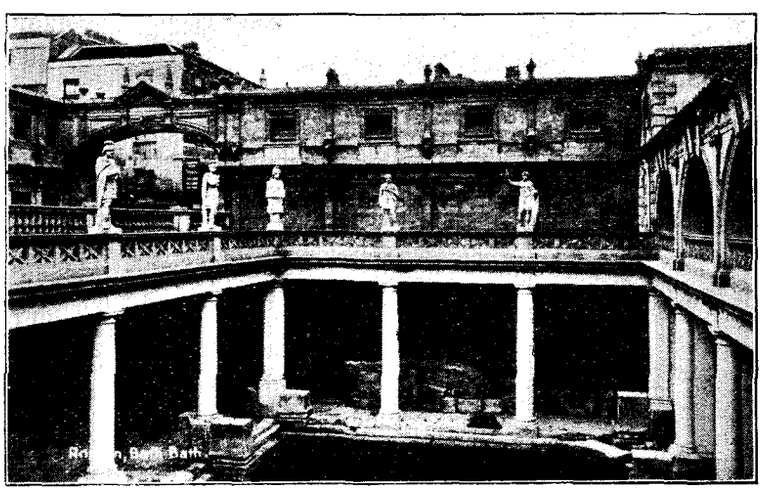
This production will take place at the Guildhall School of Music Theatre, John Carpenter Street, Victoria Embankment (two minutes from Blackfriars Station), on Friday and Saturday, Mar. 15 and 16, commencing at 7.30 p.m. Tickets, *5s. 9d., 3s. 6d., 2s. 4d.* (all reserved), may be obtained post free from Mr. L. Gartland, Room 26, Ground Floor, G.P.O. North, E.C.1. No tickets will be sold at the doors.

BATH.

INTRODUCTION OF AUTOMATIC TELEPHONE WORKING AT BATH.

BY J. M. CROMBIE.

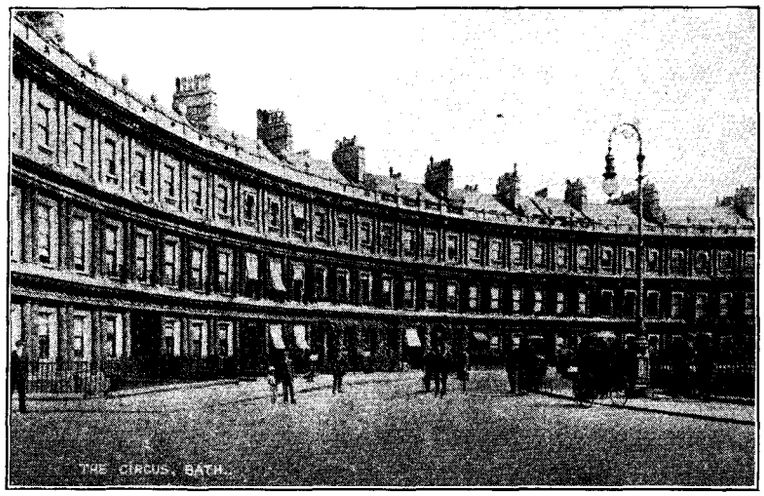
BATH, that city of deathless memories, where many of the greatest men have lived, and where most of the famous people of the 18th century resided at some time or other, has a history extending over 2,000 years. The 18th century and the early part of the 19th was the time of the city's greatest prosperity. During that period persons of note flocked to "The Bath," where ills of mind and body disappeared in the healing waters and the whirl of pleasure. Amongst those visitors were the great statesmen, Pitt; Wilberforce, of slavery fame; Burke, the orator and member for Bristol; Oliver Goldsmith; Horace Walpole, and the Earl of Chesterfield. Thomas Gainsborough, the eminent portrait painter, knew the city well, and Sir Thomas Lawrence studied there for 3 years. It was at Bath that Herschel discovered the new planet Uranus, and there, too, Sheridan wrote some of his most amusing comedies. Many distinguished soldiers and sailors either came on holiday to Bath or lived there. Lord Clive, founder of the Indian Empire, spent his last days in "The Circus," that stately and dignified example of domestic architecture at its best. General Wolfe, of Quebec, lived at Trim Street, and the hero of Trafalgar also resided for a time in the city.



THE ROMAN BATH, BATH.

From the postal point of view, it is of interest to recall that two prominent citizens of Bath, Ralph Allen and John Palmer, were pioneers in Post Office reform. In 1720, when Allen was only 26 years of age, he originated a scheme of cross-country posts, whereby letters &c., were carried direct from one town to another instead of circulating via London. The scheme worked so well that Allen was given the entire management of it. It is said that for over 40 years he made an income of £12,000 a year from his postal activities, and most of this large sum was expended by him for the good of the city. John Palmer was the son of a prosperous brewer in Bath and was born in 1742. For a time he acted in London as his father's agent in connexion with the theatre of which his father was proprietor. In the course of his travels about the country Palmer observed how indifferent were the means of communication, both for travellers and the Postal Service. The establishment of Ralph Allen's cross-country post services had been a great boon to the public, and Palmer resolved that he would try to do something to make the delivery of letters more frequent and expeditious. At that time letters were carried by mounted post boys, or in mail carts, and both these modes of conveyance were slow. Palmer prepared and submitted a scheme in which he proposed that letters should be carried in four-horse coaches with no outside passengers, and that the coaches should be guarded against the attacks of highwaymen. At first the scheme was regarded as impracticable, but ultimately it was decided that a trial should be made of it. On Aug. 2, 1784, Palmer watched the first mail coach start from Bristol for London. His scheme was so successful that, within a fortnight, coaches started running from London to many of the larger towns in England, and two years later the first coach ran to Edinburgh. The system proved economical, as well as speedy and safe. It enabled the Post Office to give the public a daily service of letters instead of only 3 times a week. As a result of this great reform, Palmer was presented with the Freedom of many of the great cities of England and Scotland, and the Corporation of Bath possesses a silver cup given to him by the Glasgow Chamber of Commerce.

During the past few years the Post Office has dealt generously with Bath. On May 16, 1927, a handsome new Post Office, in keeping with the architecture of the city, was opened by the Mayor, Alderman Cedric Chivers. In this building ample accommodation was set aside for the housing of an automatic telephone exchange to replace the existing manual exchange. The work of installing the auto exchange was duly proceeded with and completed, and the transfer to the new system effected at 2 p.m. on Jan. 26.



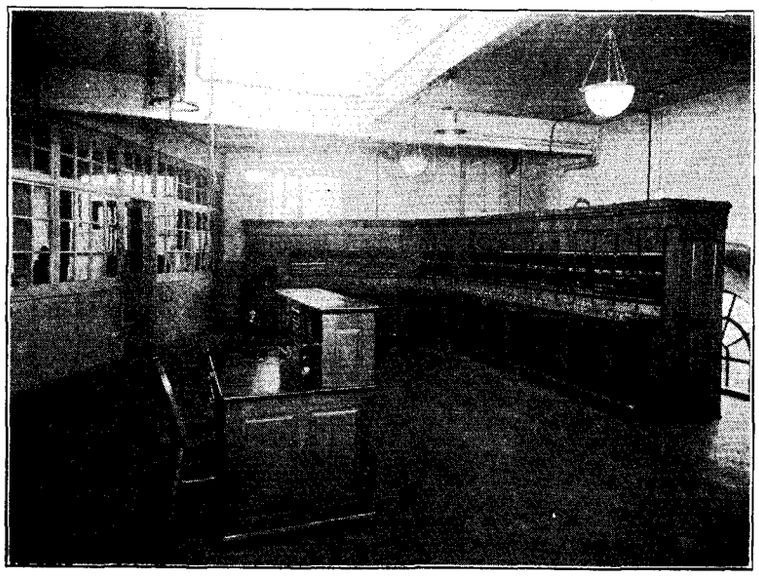
THE CIRCUS, BATH.

The particular system selected for the Bath area is known as the Standard Automatic Multi-Office System, and admits of the inclusion of all exchanges within 5 miles of Bath in the one scheme, the same numbering scheme being used throughout.

For the present, the Bath and Batheaston Exchanges only have been converted to automatic working. The other exchanges in the Bath Local Fee Area, viz.: Combe Down, Limpley Stoke, Newton St. Loe, Saltford, and Weston (Bath) remain manual, and retain their present numbering schemes.

Numbering Scheme.—Subscribers' lines connected to Bath and Batheaston Exchanges are numbered :—

Bath	2000-5199
Batheaston ...	8100-8299



MANUAL BOARD WITH SUPERVISOR'S DESK.

Dialling.—Subscribers on Bath and Batheaston Exchanges are able to call other subscribers on these two exchanges by manipulating a *dial*. This piece of apparatus is associated with every automatic subscriber's installation. The full *number* required is dialled. This action routes the call to the required exchange and number.

Dialling-out Exchanges.—The five manual exchanges in the Bath Local Fee Area are obtained by Bath and Batheaston subscribers by a dialling-out code.

The codes are :—

Combe Down	63
Limpley Stoke	65
Newton St. Loe ...	66
Saltford	64
Weston (Bath)	62

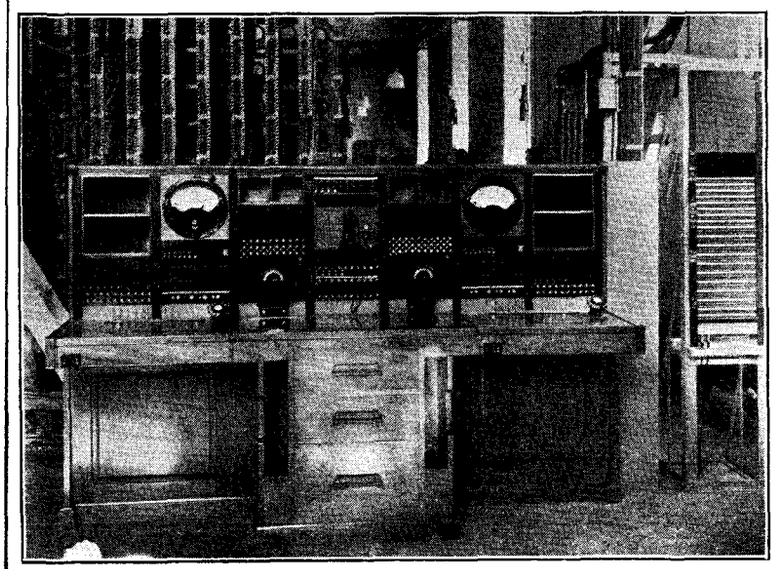
Automatic subscribers requiring a number on any one of these five exchanges dial the appropriate code. This action lights an incoming junction lamp at the distant exchange, where an operator answers and effects the call.

Manual Switchboard.—A manual switchboard is provided in the Bath Exchange building to deal with two-unit calls, trunk calls, calls for rural party lines, enquiries, complaints, and service calls. There is no manual board at Batheaston. All calls to and from Batheaston subscribers circulate through Bath. Calls dealt with manually are controlled at Bath.

For calls which are dealt with at the manual board, automatic subscribers dial the following numbers :—

Two unit and trunk	0
Enquiries and complaints	91
Service	92
Calls *for* a subscriber on a rural party line	93

Calls for "telegrams" are obtained by dialling 90, and calls to "test desk" (Bath and Batheaston Exchanges only) are obtained by dialling 99.



TEST DESK.

These two services are not dealt with at the Bath manual board. On dialling 90, the subscriber is automatically connected to the phonogram room at Bristol, some 12 miles distant from Bath.

The manual equipment consists of the following :—

"A" positions	5
"A" and "B" mixed position ...	1
Cordless B position	1
Enquiry positions	3
Test desk positions	2
Filing sections	1
Supervisor's desk	1

A feature of special interest is the provision of a cordless "B" position to deal with the traffic incoming from the Bristol local exchange. In this case the operator is provided with a strip of digit keys of the type shown below :—

1	2	3	4	5	6	7	8	9	0

The "B" operator at Bath receives the request for the call over the Bristol local exchange order wire and assigns a junction as in manual practice. She then associates automatic sending apparatus with the junction by the depression of a cord circuit key, and sets up the call by depressing in succession the digit keys corresponding to the wanted number. The sending apparatus operated by the digit keys then transmits the requisite trains of impulses as though the number had been dialled. This method is much quicker than that of dialling, and is justified on account of the large volume of incoming traffic from Bristol local exchange.

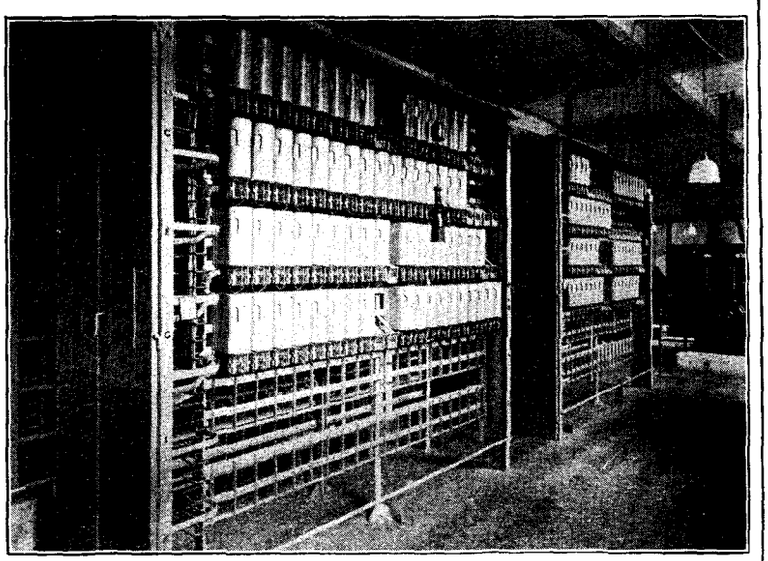
Special Faults Circuit.—An important feature of the manual board equipment is the provision of a special faults circuit. This circuit appears in the outgoing junction multiple of the Bath manual board, and terminates on a telephone in the automatic apparatus room. It is used by operators for reporting to the engineer urgent faults which seriously affect the service by holding up switches.

Switch-hook and Disconnection.—When an automatic subscriber is through to another automatic subscriber, a dialled-out exchange, or "telegrams," the replacement of the calling subscriber's receiver automatically restores all switches to the normal position. Except in the case of calls to "0," "91," "92," and "93," automatic subscribers are warned to avoid touching the switch-hook during a conversation, otherwise it may be necessary to redial the number.

In the case of calls obtained via the Bath manual board, however, the switches are held by the manual exchange, and standard "flashing" facilities for subscribers are thus provided.

P.B.X. and Auxiliary Groups.—Special facilities are provided on certain groups of automatic switches to meet the needs of subscribers with auxiliary lines. Such subscribers are generally known by the first number of the group. When this number is dialled and is found to be engaged, the switch automatically "searches" or moves on to the next number, and so on until a disengaged line is found. If, however, all the lines in the group are engaged, the "busy" tone is connected.

It is also important to note that if any number other than the first of a group be dialled, searching does not take place; e.g., if the second number



FIRST AND SECOND NUMERICAL SELECTOR BOARDS.

of a group be dialled, connexion is made with that number. If it be engaged or out of service, the switch does *not* search for a free line.

Dialling-in.—Facilities are afforded on all "no delay" basis routes (except the Bristol local incoming circuits) terminated in Bath, whereby Bath and Batheaston subscribers can be dialled direct. A dial is fitted on every position at the distant or "dialling-in" exchange, and the operators at those exchanges dial the required numbers in the same way as an automatic subscriber does. This operation is known as "dialling-in." For effecting "through" calls, the distant exchanges dial "0," and call the Bath manual board on a special group of answering jacks, known as DX "0" lines.

The capacity of each exchange is as follows:—

	Present.		Ultimate.	
	Line Switches.	*Final Selectors.*	*Line Switches.*	Final *Selectors.*
Bath	3,040	3,200	4,900	4,900
Batheaston ...	190	200	Not yet fixed.	

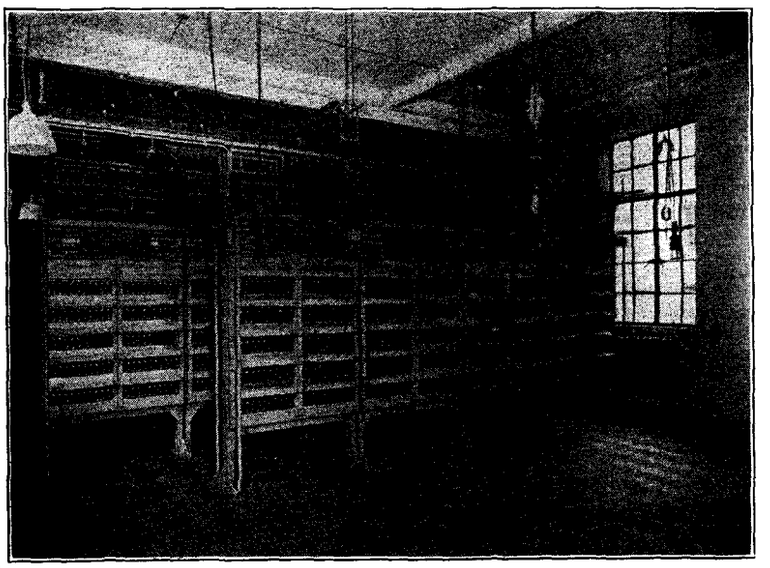
Because Batheaston Exchange takes the same numbering scheme as Bath and is dependent on Bath for effecting all calls dealt with manually, it is known as a "satellite" exchange to Bath.

Switching Apparatus.—The switching apparatus at Bath Exchange is divided into four groups:—

(*a*) Pre-selector or line switch.
(*b*) First group selector.
(*c*) Second group selector.
(*d*) Final selector.

At Batheaston Exchange line switches and final selectors only are fitted, all calls circulating through Bath for connexion with 1st and 2nd group selectors. The small volume of local traffic at Batheaston makes such a course economical.

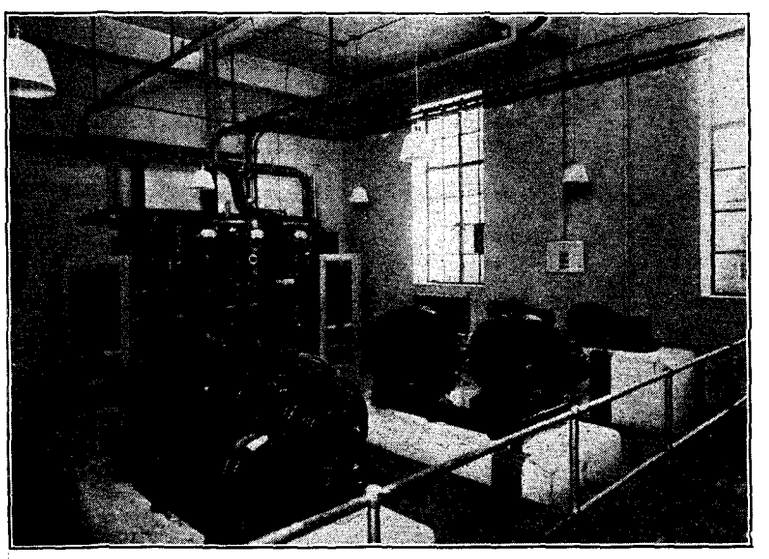
Line Switches.—A line switch is associated with each individual subscriber's line. When a subscriber lifts his receiver, or, in the case of a P.B.X., calls the exchange on any one of the exchange lines, the line switch connected to the line in question operates, and gives access to a 1st group selector.



LINE SWITCH AND FINAL UNITS.

It should be explained that, while line switches are provided on the basis of "one per direct exchange line," the 1st, 2nd, and final selectors are provided according to the requirements of the volume of traffic to be dealt with in the busy hour.

Recording of Calls.—Each subscriber's line is fitted with a register. Registration is effected when the called subscriber takes off his receiver. If the called subscriber does not reply, or if the "busy tone" or "number unobtainable tone" is heard, registration does not occur. When a subscriber calls an operator at a "dialled-out" exchange by dialling a number (e.g. 62 for Weston (Bath)) the operation of the register is controlled by means of a "registration control" key at the distant exchange when the called subscriber has been obtained.



POWER EQUIPMENT.

Alarm Signals.—Alarm signals, which operate after 3 minutes, are provided on final selectors to indicate that a calling subscriber has failed to replace his receiver after that of the called subscriber has been replaced. Similar signals are provided on 1st selectors to indicate that a called subscriber has failed to replace his receiver after the calling subscriber has done so, and to indicate that a calling subscriber has removed his receiver without dialling. The Engineering Department deals with such cases.

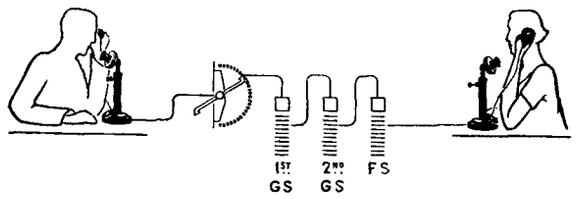
Signalling Tones.—Dialling Tone (DT).—When a calling subscriber's line is through to a 1st selector, this signal (a *continuous* low pitched " burring " sound) is heard, indicating that dialling may be commenced. Dialling should not be commenced until this tone is heard.

Ringing Tone (RT).—When a connexion to a called number is effected, and the called subscriber is being rung, an *interrupted* low-pitched tone, corresponding to the ringing, is heard by the calling subscriber. This continues until the called subscriber answers, or until the call is abandoned.

Busy Tone (BB).—If the line, or every line, of the called subscriber, or every outlet between two sections of the automatic apparatus, is engaged, a *periodic* high-pitched " buzz " is heard by the calling subscriber. When this occurs before the last digit of the number wanted has been dialled it indicates that the apparatus is engaged. When it occurs after the complete number has been dialled it indicates that the line is engaged. The receiver should be replaced in either case and the number dialled again after an interval of about two minutes.

Number Unobtainable Tone (NU).—When a spare number, a faulty number, or a number that is temporarily out of service is dialled, a *continuous* high-pitched " buzz " is heard by the calling subscriber. When this is heard the subscriber should replace the receiver, then lift it again and re-dial the number. If the number unobtainable tone is still heard, the subscriber should dial 91 (Enquiries) if he wishes to ascertain the reason why it is unobtainable.

Changed Number Lists.—Lists showing the old and new numbers of Bath and Batheaston subscribers were exhibited on the Bath manual switchboard, and formed a ready reference. Copies were also distributed extensively to exchanges throughout the district.



A CALL IN PROGRESS.

Directory Supplement.—A supplement to the existing Telephone Directory, bearing the new numbers of Bath and Batheaston subscribers was issued, in advance of the automatic transfer, to the subscribers on these two exchanges.

Advising Subscribers.—A preliminary letter was sent to each Bath and Batheaston subscriber, informing him of the forthcoming alterations, and notifying the change of number. A final letter, repeating the new number and giving the date and time of the transfer, was also sent to each Bath and Batheaston subscriber 4 days in advance of the transfer.

A complete demonstration set was fitted up at the Bath Head Post Office for 3 months prior to the transfer, and demonstrations were given daily at specified hours by an officer specially trained for the purpose. This arrangement proved of great interest to members of the public, nearly 1,700 of whom attended the demonstrations.

A Multi-Hall coin box was also joined up to the set, showing the whole operation with regard to the manipulation of buttons A, B, &c.

Arrangements were also made for every Bath and Batheaston subscriber to be visited by an officer of the Post Office, who explained in detail what was involved under automatic conditions. Each officer was supplied with a card list of the subscribers in district order, instruction cards, and a schedule of the course of instruction to be given to subscribers. The officers were given a few days training before commencing their visits.

Training of Staff.—When the new manual equipment at Bath was available, opportunity was taken, in advance of the transfer, to train the whole of the operating staff in the working of the new apparatus.

Testing Circuits after Transfer.—All subscribers' circuits were tested by the operating staff after the transfer. Each subscriber was called, and a test made of the speaking and signalling. To facilitate this work 16 special telephones were provided in a room adjoining the new manual exchange.

The visiting officers ascertained and recorded whether or not the subscribers' premises were to be open at the time of transfer, and from these records lists were prepared of the lines to be tested (*a*) immediately after the transfer was effected, and (*b*) on the following day, or later if necessary. Test calls made by subscribers, or by engineering officers from subscribers' premises, were credited by ticket.

[*The photographs of the plant with which this article is illustrated were kindly supplied by the Contractors, Ericsson Telephones Ltd., of Nottingham.*]

INTERNATIONAL TELEPHONY.*

BY H. TOWNSHEND.

(*Continued from page* 89.)

Organisation of New Services.

THE opening up of services between new countries in Europe has been so rapid in the last 2 or 3 years as to constitute a considerable volume of administrative work and I think it is relevant to describe how a new service is organised. The C.C.I. is not directly concerned with the organisation of individual services. Its machinery, however, keeps the administrative and engineering staffs of the various European countries in continuous touch; so that, when there is a prospect of a suitable circuit becoming available from—for example—this country to a part of Europe not yet linked up with it, the terminal administrations, i.e., the British Post Office and the Continental country at the other end of the circuit, are aware of the possibilities and can start in time negotiating the necessary arrangements for opening the service. The main points to be settled are the rates and the division of the revenue they are to bring in between the various countries through which the line passes; and the accessory services to be provided. I will come back to these points later. The first task of the C.C.I. was naturally—as I have said—engineering co-operation to provide the new plant for the international services; this still, of course, continues; but it may be said, I think, that we are now in the second stage of progress, that of organising the administration of the services.

The International Telegraph Conference and the International Telephone Regulations.

The procedure of organisation has been very much simplified by the drafting and approval at the last general International Telegraph Conference (held in Paris in 1925) of a set of Rules called the International Telephone Regulations. The Telegraph Conference incidentally took over a general responsibility for the pre-existing and formerly independent C.C.I., which now occupies itself to a considerable extent on the administrative side with drafting fresh Regulations for consideration at the next Telegraph Conference—due in 1932. The International Telegraph Conference (which meets only every five years or so) differs fundamentally from the C.C.I. (which meets annually) in that, while the latter can only give advice, the Regulations passed by the Telegraph Conference are binding on all the administrations, including the British Post Office, which are members of the International Telegraph Convention—a permanent institution resting on diplomatic sanction, and dating back to 1875. (This, of course, applies equally to telephone and telegraph regulations.) It was, therefore, necessary in 1925, owing to the lack of experience of international telephony in Europe, to keep the regulations governing telephones in rather a skeleton form, and, in particular, to provide in certain instances for various alternative ways of doing the same thing. The International Regulations are a dull subject but they are so fundamental a part of the administrative machinery that I am afraid I must say something about them.

The Regulations, after laying down some rather obvious general principles, such as that the Administration of each country provides and maintains the international lines passing through its own territory and that these should be maintained and worked as well as possible, pledge the Administrations to conform as far as possible with the recommendations of the C.C.I. on technical questions. The object of this is to encourage the standardisation of line equipment in accordance with the best practice, after discussion by all the experts of the various countries represented on the C.C.I. It is provided that ordinarily an international line is reserved exclusively for international telephone calls and that when the internal lines of the country are being used for international calls the latter get priority over the internal calls. This is very important. In practice each of the important international services is served by means of a number of " through lines " between telephone centres in the terminal countries; for example, the Anglo-German service has now 15 through lines terminating at London in this country and at Berlin, Hamburg, Cologne, Frankfort, Dusseldorf and Bremen in Germany. (Each country, of course, selects its own terminal exchanges—" *tetes-de-ligne* "—for international traffic with each other country.) These 15 lines are used for Anglo-German calls and for nothing else (except for a comparatively small number of calls to some countries beyond Germany, like Czecho-Slovakia, which have not yet enough traffic to fill up a through line to England). If a call, for example, from Glasgow to Dresden has to pass over the ordinary Glasgow-London and Berlin-Dresden trunks in Great Britain and Germany respectively, it takes precedence over all the internal calls on those lines; that is to say, the call from Glasgow to Dresden cannot be delayed on account of pressure of communications between Glasgow and London or between Berlin and Dresden.

The Regulations also provide for a skeleton system of routine testing, which has since been considerably developed by the C.C.I., and for some practical details, such as the interchange between the Administrations of telephone directories for service use. They also lay down a set of operating rules about the way in which calls should be passed over the international

* Paper read before the Institute of Public Administration on Dec. 13, 1928.

lines, but these hardly go beyond general principles. As regards types of service, they provide for an optional service of "Urgent" calls, i.e., calls paid for at a higher rate, taking priority over ordinary calls (I will return to this point when dealing with rates), and also for a category of super-urgent calls called "Lightning Calls"—this service is also optional. It is laid down that Government calls, which are defined, get compulsory priority over ordinary calls, but no preference as regards charges.

The Regulations further lay down the general principles—*only* the general principles—of charging. It is compulsory to charge a minimum rate, between any two given places, covering 3 minutes' conversation, and to make a proportionate charge per minute on the excess over 3 minutes. The circumstances in which calls can be cancelled are laid down. It is provided that calls should be charged for whenever put through to the telephone number asked for, i.e., whether the person who answers is the one who is wanted or not; but an optional auxiliary service, called "*Préavis*" ("forewarning"), at a higher rate, is also provided for—this enables a call to be booked with the name of the person wanted as well as his number, and a report is then made to the caller's telephone by his exchange (which ascertains the facts from the other end), if this person is not available.

"Personal" Calls.

In passing, I want to go into this question in some detail. I mentioned, *à propos* of the general theory of telephone service, the truism that its real basic object is to put two *people* into oral communication with each other. In short-distance services, given efficient and rapid means of communication between any two *telephones*, it suffices to see that as many people as possible have telephones in their houses and offices and that these telephones and their warning bells are arranged in the respective buildings in the most handy way possible. If the person wanted happens to be out, the caller has to make and pay for another call; it would not be possible for the telephone administrations to undertake to find particular *people*—i.e., to insure the caller against the risk of not getting the man he wants—without incurring expenditure which would necessitate charging an insurance premium, in the form of an additional rate, which would be out of proportion to the small amount of the caller's money at stake on a short-distance call; this amount is, of course, measured by the ordinary minimum charge for a 3-minutes' talk. Looking at the question from the cost side, the greater part of the cost of handling a short-distance call is (speaking generally) the operating and switching plant costs; economic efficiency, therefore, demands that these be kept as low as possible, thus leaving no room for the extra operating involved in finding individual people, as distinct from connecting their telephones. But in long-distance service the position is quite different. Here the caller, while he is speaking to the distant subscriber, has to be given the *exclusive* use of thousands of pounds' worth of line plant. The main cost of a long-distance call is therefore represented by the value of the line-time, which is proportionate to the duration of the period during which the expensive long line is held at the caller's disposal. The operating costs are relatively small; and it is economically sound to elaborate the operating if by so doing you can increase the return from the line. If a long-distance call is merely put through without any preliminary warning and the line has consequently to be held up uselessly while the called person is being found, for perhaps the greater part of the 3 minutes for which the caller must pay, or even if, when the call is put through, the line is held only long enough for the person who answers the telephone at the far end to inform the caller that the man he wants is out, there is material economic waste. Various methods have grown up for eliminating this waste by setting up operating machinery for trying to ensure in advance, with a *minimum* use of the international line, that the called person will be in when the call comes through, and also, after ascertaining that he will be in, to get him put on the telephone promptly and without further cost to the caller when the call is about to be put through—if possible just in advance, while the expensive long line is being used and paid for in connexion with the previous call. The first of these steps is to some extent provided for by the *Préavis* system which has grown up in Central Europe. The second, and additional, step has, so far, been taken only in America and in Scandinavia. Although the methods vary somewhat and are called by different names, it is convenient to describe the completer method as the "Personal Call" service. The complete personal long-distance call service has three characteristics. First, the telephone Administrations co-operate as far as they can in putting the caller into touch with the called person, in return for an additional fee. Secondly, if they do not succeed in doing this, the caller only pays this fee and does not pay the ordinary rate for the call. (The fee, from his point of view, therefore, represents a complete insurance premium against the risk of having to pay for a 3-minute call which is of no use to him.) Thirdly, when the call is put through, the charge for the talk does not begin to run until the caller and the person whom he has asked for are both on the telephone and connected with each other. A little reflection will show that the whole essence of the system is really contained in the last proviso; because, once the Administrations agree not to charge for the use of the line until the two particular people have been put into touch over it, they have (*ipso facto*) admitted that the object of the service is to offer a kind of insurance to the caller, and, therefore, that the premium should completely cover the risk; and, once this is conceded, the Administrations are bound in their own interests to do all they can to see that this risk is obviated so that the policy does not become a claim. The *Préavis* differs fundamentally from the personal call because the supplementary fee for the *Préavis* is charged merely for the preliminary warning, after which the Administrations take practically no further responsibility. For example, if the answer to the warning call is favourable, the call is put through when its turn comes—possibly some time later if there is delay on the line—without any further precaution, and the caller has to pay the full charge for a 3-minute talk as well as the supplementary charge for the warning call even if the person he wants has meanwhile gone out and cannot be got to the telephone at all, or not without further delay, during which he is running up a bill for additional minutes of line-time.

History of "Personal" Calls in Relation to Standardisation

I have gone into this point in some detail (though, of course, by no means fully) not only because the personal call itself is, in my view, more than a mere accessory service of technical interest—it has, I think, a certain fundamental character in relation to the theoretical object of long-distance telephone service; but also because the history of the subject brings out very sharply some general administrative considerations with which I shall try to deal a little later in reference to standardisation. I will only say now that the *Préavis* system, which contrasts unfavourably with the personal call as worked in North America and in Scandinavia, was endorsed—as an optional facility—by the Telegraph Conference of 1925 (on which it is important to remember that America was not represented since the United States' Government does not adhere to the Telegraph Union), after much controversy which centred round the fundamental point I have emphasised, viz., whether the charge should begin to run as soon as the two *telephones* (after the preliminary warning) are connected over the international line, or not until the Administrations have put the two *people* into conversational touch. This action of the Conference constitutes, in my personal opinion, a classical telephone example of the evils of premature attempts at standardisation. Now that the transatlantic telephone service, in which the full person-to-person call is available, is open to most of the European countries, there is evidence of a desire to extend the better practice in Europe, and the Administrations will next year discuss on the Consultative Committee how to get over the practical difficulties which are undoubtedly involved in modifying the standardised *préavis* system. With good will on all sides, however, there are good hopes of overcoming the difficulty.

Scope of the International Telephone Regulations.

To return to the International Regulations, you will see that these comprise only rules which are to be found in a much more complete and elaborate form in the internal service regulations of most of the countries which have highly-developed telephone systems. The International Regulations are, in fact, only a skeleton scheme—the bare bones of a working system of international telephony—left to be clothed and nourished by the individual administrations with the help and advice of the C.C.I. This may at first sight seem a pity; but it is really not a bad thing at the present stage of European international telephony. It must be remembered that before the International Telegraph Conference of Paris in 1925, at which the present International Regulations were drawn up, there were practically no agreed international telephone regulations at all. Had the Conference attempted to lay down a detailed scheme of working, the effect would probably have been disastrous. Indeed, I think as it was they went too fast in certain respects—e.g., the *préavis* call to which I have just referred. The point is that the International Regulations are compulsory; all the European countries and many others are pledged to adopt them—unless, in a particular service, a country can, so to speak, contract out of some particular regulation by a special agreement with all the other countries concerned in that service. Obviously, any extensive practice of contracting out would destroy the whole object of the regulations, which is to secure the degree of uniformity necessary for efficiency. But, fortunately or unfortunately, different working methods on important points have grown up in the telephone systems of the leading countries of Europe—I mean leading in a telephonic sense—especially Scandinavia, Germany and Great Britain. The example I have already cited—that of the *préavis* call—is only one of many instances of this, of varying importance. I shall have occasion to cite others in dealing with rate-policy. Naturally each country is inclined to think its own way the best, and this is particularly the case in the more important points on which they differ; no country wants to alter its own system in important particulars, or to train its public to use a different system when speaking over the international lines from the one it is accustomed to at home. Indeed, in practice the leading countries definitely will not do this unless their system can be proved by practical experience to be inferior to another. The tactful silence of the International Regulations on some points and the alternative methods which they provide for in others leave a good deal of latitude for each country to go its own way—for the present. Meanwhile, information about the various practices and points of view is compared and collated on the C.C.I., the results being circulated in the form of advisory memoranda to all the countries; and there are already some signs of countries, which have hitherto adopted inferior methods (and for one reason or another this is the case in some respects in *every* country), being ready to learn in a scientific spirit from their neighbours. When we have all learned to subordinate national *amour-propre* to scientific efficiency in matters telephonic, the time will be ripe to extend the scope of the International Regulations, until they provide for uniformity on all those points on which uniformity is really desirable.

Uniformity and Standardisation.

THIS question of uniformity, as it is generally called on the Continent, or standardisation, which is the usual expression in England and America, is so fundamental that I think it is worth while considering it generally. I believe it is not altogether fanciful to see in the difference of use between the two words (although in practice they mean much the same thing)

a historical difference in the point of view from which the common conception, so far as it applies to telephony, has been arrived at. On the Continent of Europe, telephony has in the past been much more closely associated with telegraphy than in America, and, indeed, in its earliest stages, the telephone service in Central Europe was grafted on to the pre-existing already highly-developed telegraph service. The German authorities claim, no doubt with justice, that this was a material help in financing the telephone service in its difficult early stages; and this is borne out by the fact that other countries have found it desirable to co-ordinate and link up their telephone service with their telegraph service at a later stage, to the mutual advantage of both. The telegraph service, of course, already had its uniform rules and regulations, and it is partly, though not wholly, this, I think, which has led to such great importance being attached by the Central European telephone authorities to providing at the earliest possible date a "Festregelung," i.e., a similarly uniform set of rules and regulations, for their telephone service. On the other hand, the early history of the telephone service in America and, to some extent, in this country and in Scandinavia, led to the growth of a number of different systems operated or owned by independent companies; and, when these were ultimately taken over by a single authority—after, in some places, a rather painful struggle, which has left behind it a slowly disappearing trail of evil consequences—the first problem was one of standardisation of plant; the conception of standardising operating methods and so on grew out of this. It must, however, be admitted that there is no English word for "Festregelung"!

Analysis of the Problem of Standardisation.—Plant, Operating and Rates.

I think it may be said generally that standardisation in its application to public utilities has three aspects, corresponding to the nature of the thing to be standardised: first, the standardisation of material (in the case of international telephony, of line plant, repeaters, &c.); secondly, the standardisation of what the French call "la manoeuvre" (in telephony, operating methods and practices generally); and, thirdly, the standardisation of charges to the public. As regards plant and operating methods, the advantages of standardisation are self-evident, though I think it must be conceded that standardisation, like most good things, carries with it certain corresponding drawbacks or, at least, dangers, which, especially in a rapidly-developing service, must be carefully guarded against. The obvious danger is that, partly owing to natural human inertia, as soon as anything is standardised on a large scale, it becomes more difficult to change it when improvements become necessary. An obvious example of the effect of this is the recent history of the temporary upset caused to the American automobile industry when Mr. Ford decided to change the type of his car. In regard to plant, this difficulty is mainly financial and it is common ground that it must be, and can be, got over; the secret of success being always to charge rates in a developing service which bring in a return sufficient to provide for development expenditure, including adequate provision for scrapping plant which has become obsolete on account of new inventions, &c., before it has reached the end of its normal life. This may involve a periodical adjustment of the depreciation accounts. To give an idea of the practical importance, at the present time, of making such provision on an adequate scale in European international telephony, I may mention that the present rate of growth of telephone traffic between this country and the Continent is in the neighbourhood of 40% a year; to cope with this growth it has been necessary to lay a new submarine cable on an average every year for the last 4 years; and technical progress has been so rapid that no two of these new cables (which contain many circuits each) are of the same type.

In regard to operating methods, while the case for some measure of standardisation is quite clear, it is not so overwhelming as in the case of plant. Some slight differences of operating practice at the two ends of the line do not necessarily injure the service. In any case, since each international call passes over a local line at each end and is handled by the local exchanges in the two countries which are being connected with each other, the complete standardisation of the operating of international calls would necessarily involve the re-standardisation on uniform lines of operating methods in the *internal* services of all the European countries. Now the difficulties in standardising operating are greater than in standardising plant, because you cannot train a new set of operators side by side with the old and suddenly switch over from a set of operators accustomed to the old method of working to a set trained in the new, which would be the analogue of what is commonly done when obsolete plant is being replaced. When operating methods are changed, there is likely, therefore, to be a period during which the service, to a certain extent, is upset. This trouble is analogous to the financial difficulty sometimes caused in changing over to standardised plant, but is not so easily met. The functioning of the existing machinery for standardising European operating methods can, I think, best be illustrated by a comparison of two representative views.

First, however, a general point about the third type of standardisation, that of rates. This stands on quite a different footing from the standardisation of plant or operating methods. The first requirement of a rate is that it should be suitably adjusted to the economic and financial conditions of the service, and whether the rate between two particular places A and B, which are 500 miles apart, is the same as the rate between C and D, which are also 500 miles apart, is obviously in itself quite a secondary consideration. For example, London is roughly 200 miles from Paris and about the same distance from Amsterdam. What the business man who has connexions in both places requires is a good service at reasonable rates; but he no more expects the charge for a call to Paris to be the same as the charge for a call to Amsterdam than he would expect to have to pay the same amount for a railway and steamer "through" ticket to these two places. If, therefore (as is, in fact, the case in the example I have chosen), the supply and demand conditions governing the telephone service on the two routes differ, there is no sufficient reason why the rate should not be settled in each case on its economic merits, whether or not the result is equality.

Nevertheless, it is obvious that *within an area not wholly separable for tarification purposes into parts bounded by co-terminous economic and political frontiers*, a system of international telephone rates in which the charges did not *roughly* correspond to distance would be open to criticism, as arbitrary, and might give rise to anomalies of the type which create local grievances. This is especially the case where you have irregularly-shaped land frontiers separating regions which have close economic ties—not an unknown condition in post-war Europe. To avoid such trouble it may be expedient to arrange international rates so that, apart from special conditions such as sea and mountain crossings, they correspond more closely with distances than the pure economics of the case could justify, as is usually done by national telephone authorities in fixing their internal rates. It is obviously a question of degree. Comparatively isolated countries like Great Britain find it both more difficult and less necessary to charge uniform rates (according to distance) on their foreign calls than do large Central European countries such as Germany, whose proportion of foreign to internal traffic is higher, and which naturally tend to look upon their foreign services more in the light of an extension of their inland service than as in a separate class by themselves. I will deal more fully with rates when I come to the finance of the international telephone services; but I wanted to outline the position in regard to this particular point of uniformity as it affects rates before comparing the views of two representative authorities on standardisation in relation to the general functions of the International Telegraph Conference and its Consultative Committee.

(To be continued.)

PROGRESS OF THE TELEPHONE SYSTEM.

THE following gives a brief review of the growth in the telephone system during the year 1928.

The total number of stations working in the Post Office system at Dec. 31, 1928, was 1,722,583, representing an increase of 124,409, or 7.8% for the year. The figures for London, England and Wales (excluding London), Scotland and Northern Ireland separately are as follows:—

	Total No. of Stations.			
	At Dec. 31. 1927.	*At Dec.* 31, 1928.	*Increase.*	*Increase* %.
London	565,590	614,183	48,593	8.6
England and Wales (excluding London)	865,634	931,803	66,169	7.6
Scotland	146,751	155,193	8,442	5.8
Northern Ireland	20,199	21,404	1,205	6.0

Residence rate installations at Dec. 31 last numbered 145,435 in London, and 229,906 in the Provinces, giving a total of 375,341. The net increase in residence rate installations during the year 1928 was 42,414, or 12.7%; the net increase in business exchange installations during the same period was 28,030, or 4.6%. At Dec. 31, 1928, the percentage of residence rate subscribers to the total exchange subscribers was 37.3%.

The total number of call offices working at Dec. 31, 1928, was 25,516, 5,505 of which were connected with London Exchanges and 20,011 with Provincial Exchanges. The increase for the year was 2,013, of which 1,825, or nearly 91%, were kiosk call offices. Kiosk call offices in the London telephone area numbered 1,214, and in the Provinces 4,807, as compared with 733 and 3,463 a year previously.

During the year 1928, 125 new rural exchanges were opened under the Rural Development Scheme of 1922, bringing the total number opened under the scheme up to 1,240. In addition to the 1,240 exchanges opened, there were at the end of the year a further 65 in course of construction.

The total number of exchanges working at Dec. 31, 1928, was 4,438, of which 2,944 serve rural areas.

The number of rural party-line stations at Dec. 31 last was 10,382, the net increase for the year being 208, or 2.0%.

The number of railway stations in rural areas connected with the telephone exchange system at Dec. 31, 1928, was 1,036, an increase of 182 on the total a year previously.

The number of effective calls originated during 1928 is estimated at 1,238 millions, representing an increase of 87 millions, or 7.6% over the estimated total for 1927.

At the time of going to press, complete results for 1928 in respect of trunk calls were not available; but for the 12 months ended Nov. 30, the number of inland calls made was 107,335,024, representing an increase of 8,048,240, or 8.1% over the total for the 12 months ended Nov. 30, 1927. For the same period, the number of outgoing international calls was 414,182, compared with 317,915 in the 12 months ended Nov. 30, 1927, an increase of 96,267, or 30.3%.

Further progress was made during the month of January with the development of the local exchange system. New exchanges opened included the following:—

LONDON—Western (automatic), Hornchurch, Molesey, Sutton.

PROVINCES—Bath, Batheaston (automatic), Hythe.

And among the more important exchanges extended were:—

LONDON—Speedwell, Woolwich, Walthamstow.

PROVINCES—Cobham, Ibrox, Irvine, Leeds (automatic), Northwood, Swindon, Uxbridge, Winchester, Wokingham.

During the month the following additions to the main underground system were completed and brought into use:—

Leicester—Market Harborough cable
Middlesbrough—Saltburn cable
Sheffield—Chesterfield cable

while 70 new overhead trunk circuits were completed, and 82 additional circuits were provided by means of spare wires in underground cables.

REVIEWS.

"*Handwörterbuch des Elektrischen Fernmeldewesens.*" *Two vols.* (*Julius Springer, Berlin. 1st vol., 830 pp., 1,319 illustrations. 2nd vol., 903 pp., 1,450 illustrations. Price, 192 marks.*)

This work, which is modestly described as a dictionary of electrical communication—we have no exact equivalent for *Fernmeldewesen*—is in reality an exhaustive encyclopaedia of all questions relating to telegraphs, telephones and electrical signals generally, whether considered in their technical, historical, economic, juristic or statistical aspects. It is edited by Dr. Feyerabend, Dr. Heidecker, Dr. Breisig and Herr Kruckow, of the German Post Office, assisted by numerous postal officials, engineers and professors, whose names are well known to us as authorities on the subjects mentioned. The rapid progress of electrical communication in its various forms in recent years renders such a work as the present particularly welcome. It fills a gap in the ranks of books of reference and covers adequately the latest important developments in this many-sided branch of knowledge.

It is difficult to notice adequately so comprehensive a book within the compass of a brief review. We may, however, mention that the subjects *Fernamt*, *Fernkabel*, *Fernsprecher*, *Ferntisch*, &c. (trunk exchange, trunk cable, telephone, trunk board) occupy 100 double-column pages, and the section dealing with telephone cable systems includes excellent maps showing the trunk cable development of the principal European countries, as well as statistics and particulars of their electrical properties. Nearly 50 pages are devoted to wireless and the same number to telegraphy, without counting the numerous references throughout the two volumes to special branches of these subjects under their appropriate alphabetical headings.

Under the geographical headings (England, Frankreich, Neiderlande, &c.) are given a general historical account of the telegraph and telephone systems, with the latest tariffs, economic results and statistics up to 1924 or later. (There are also special articles dealing with the questions of tariff policy and statistics in themselves.)

Telegraph and telephone apparatus in all its branches is fully dealt with from the technical standpoint, and methods of working and all aspects of telephone and telegraph practice are fully treated. German practice is, naturally enough, chiefly drawn upon for illustration. Bell, Hughes, Baudot, Murray, Morse, Pupin, Krarup, to name only a few of the goodly company of inventors and improvers, appear in their turn in these pages, which contain not only a description of their works but a brief biographical note of their lives. From this it will be gathered that this book, besides being an encyclopaedia, forms also a biographical dictionary; it will serve, too, as an up-to-date technological dictionary, for all the German alphabetical headings are followed by their English and French equivalents. The volumes are handsomely bound and excellently illustrated. They constitute a work of reference which no scientific library should be without, containing as they do authoritative information on all subjects connected with electrical communications from "A operators" down to "Zugfunk" (railway-train wireless).

"*Civil Service Arts Magazine.*" (*Published by the Civil Service Arts Council, Treasury Chambers, Whitehall. 6d. quarterly.*)

We welcome the appearance of this new addition to the ever-growing ranks of periodicals connected with the service. The Arts should certainly possess their own medium of expression, and it is this medium which our new contemporary seeks to provide. The first issue is largely concerned with the drama and photography, but there are sections devoted to art, music and literature. It is a healthy sign that the contributors to this number come from all ranks of the staff, from porters and telegraphists upwards.

We note with special interest the proposal of a correspondent for the formation of a C.S. Three Arts Club, of which we hope more will be heard.

We wish the new venture all possible success.

CHRISTMAS TELEGRAPH TRAFFIC IN SOUTH AFRICA.

A NOTEWORTHY feature of the South African telegraphs is the huge traffic on Christmas Eve, due to the popular custom of sending greetings by wire.

This season the volume was larger than ever, and the following figures, relative to the transactions at the Central Telegraph Office, Capetown, for the six working days ending Dec. 24 in each of the last three years, show the continuous growth of this traffic, which for 1928 as compared with 1927 was almost phenomenal:—

December, 1926.		*December*, 1927.		*December*, 1928.	
Sat., 18th ...	12,419	Mon., 19th...	18,235	Tues., 18th ...	25,725
Mon., 20th ...	19,007	Tues., 20th ...	16,043	Wed., 19th ...	22,659
Tues., 21st ...	17,538	Wed., 21st...	17,198	Thurs., 20th	21,342
Wed., 22nd ...	17,232	Thurs., 22nd	19,284	Fri., 21st ...	22,401
Thurs., 23rd	22,041	Fri., 23rd ...	28,374	Sat., 22nd ...	26,103
Fri., 24th ...	42,703	Sat., 24th ...	39,491	Mon., 24th ...	63,365
Total ...	130,940	Total ...	138,625	Total ...	181,595

The total of 63,365 messages for Dec. 24, 1928, is the greatest ever recorded in Capetown and South Africa, and exceeds the previous highest—that of Christmas Eve, 1925—by some 16,000. The number of telegrams handled on Dec. 24 is almost four times the normal, and the figures quoted for the one office, which may be taken as typical of the whole South African service, illustrate what is a very heavy volume of traffic for a comparatively small community.

E. E.

JOHN LEE.

[John Lee's interest in economic and administrative questions is well known to our readers. We feel sure that they will welcome the following article which is reprinted by kind permission of Sir Henry Bunbury and of the Editor of *Public Administration*.]

SUNDAY evening in the Common Room at Balliol. Standing at the fireside, John Lee, summing up to an intent audience of men and women the discussions on the varied problems of industrial management which they had met to consider. For over an hour he held them, and no attention flagged. In dead earnest, yet with the racy humour which was part of the man constantly breaking out and never far away. Occasional references, duly announced, to the "little buke" in which he had jotted down his notes of the discussions; for the rest, an easy, conversational, closely reasoned and critical analysis of three days of lecture and debate. If the Chairman's function on that occasion was to stimulate thought and interest among men and women whose daily task lay in doing things rather than in thinking about them, John Lee fulfilled his part that evening supremely well.

A dreary chamber at St. Martin-le-Grand, known, not inappropriately, as the Accumulation Room. The annual meeting of the Post Office Ambulance Corps. High officials make speeches, good of intention, a little solemn in manner and dull in matter, as civil servants' speeches—heaven forgive us—are apt to be. John Lee rises to propose some resolution or other. He begins, and ends, by telling a story which, he says, he has just been reading: it is the story of the Good Samaritan. Gradually the parable assumes a Post Office setting: Priest and Levite become Controller and Superintendent—busy and conscientious men with many official duties needing their attention; and so on to the end. This was art, and something more than art.

One more episode. Lee as Chairman of the most difficult Committee of the difficult International Telegraph Conference at Paris in 1925, representing Britain, if not *contra mundum*, at any rate *contra Europam*. The French of international conferences aspires to rather than achieves the language of France: Lee could lay but a poor claim even to "conference French." He conducted the proceedings, it is reported, in a fluent but hybrid lingo in which his mother tongue, openly or thinly disguised, contributed to his sentences as occasion demanded. With his imperfect knowledge the effort of following the discussion must have been even more severe. Yet, under this handicap, he held and ruled session after session an expert and critical assembly, and got his way, not so much by what he said as by the way in which he said it, and by the force of his personality. Men could not but like him and trust him.

Incidents such as these may help to give some idea of the man who was one of the creators of the Institute and the first Editor of its Journal, whose foundations he laid. He was, it has been said, a born journalist. He had for a good many years plied the craft in his spare time, and loved it. He read widely. His first essays were in literary journalism and novel-writing. But behind the delight in word and phrase was a restless, inquiring mind which insisted on finding out what made the wheels go round and why they should sometimes go round only with effort and friction. He soon developed an interest in commercial economics, which gradually crystallized more and more round the problems of industrial administration and personnel management. It was no doubt his intensely sympathetic nature and his passion for justice that guided his attention so definitely to the human side of industrial and official organisation. He would always speak of the psychology of a situation, and he loved to explain the gradual development of the "scientific management" movement in America out of, and far beyond, its early conception of a purely mechanical efficiency. Perhaps the best papers out of several which, in addition to numerous reviews, he wrote for the Journal, were his "Personnel questions in Government enterprises and large-scale industries" (April, 1927), and a short paper on "Security," in the first number. In both the psychological interest dominates.

It must have been these same qualities that inspired his interest in the formation of the Institute—the passion for knowing how things are done and might be better done, and the desire to extend to others engaged in dull and repetitive work the enlargement of interest which he had, though hardly, won for himself; for he began his working life as a telegraphist before he was sixteen. As far back as 1919 he took an active part in the organisation by the Society of Civil Servants of its first series of lectures on administrative subjects, and in 1920 proposed an essay competition and a silver medal in connexion with them. In 1922 he was made Chairman of a Sub-Committee promoted by the interested associations to consider the educational work which an Institute of Public Administration, if formed, could undertake. When in 1923 the Institute was founded, he became the first Editor of its Journal, and in spite of the many activities which were then crowding upon him, he held the post for the first year of its life, when it was clear that competent hands were ready to take it over. His editorial notes in the first number gave an admirable statement of the scope and principle of such a publication. He served on the Council from the start and was Chairman in 1925-26.

Lee was an incorrigible optimist: even the warnings given by his severe illness in 1926 and the permanent damage to his constitution that it left behind did not daunt him. Yet the news that he must abandon some of the activities to which he had dearly looked forward, and for which his retirement would provide the opportunity, was a heavy blow. He met it with his usual gay courage, but those who knew him best realised all that it meant to him. Editing, occasional writing (in *The Times Engineering Supplement*, *Economist*, and *Church Times*), and his new business interests remained, and into these he threw all, and perhaps more than all, the energy that he was permitted to use, till the end came suddenly, and with plans and aspirations that he still cherished unfulfilled.

The value of his contributions to administrative science lay perhaps chiefly in the ideas thrown out by his singularly fertile and stimulating mind. He was indeed a little impatient of the pursuit of detail, as a man of his qualities of intellect and character is apt to be. His influence on others, both in the departmental world and in the progressive industrial circles in which he moved, was his greatest achievement. To act as guide and interpreter was his métier. His output in the last few years before his illness was astonishing—"Plain Economics," "The Principles of Industrial Welfare," "Industrial Organisation," "Management," "An Introduction to Industrial Administration," "Christian Social Duty," and, still more recently, the editorship of the Dictionary of Industrial Administration. All were written with the same dominant motive, that of inspiring thought and inquiry, of pointing to impending developments, of challenging traditional notions which seemed to him to have outlived their day. He was interested in public administration, but perhaps rather more in the light which it might throw on, and in its relation to, the problems of industrial administration, than in its principles and problems in themselves. It may be that he felt the official machine (how he would have hated the word!) a little too rigid and unreceptive for his eager and idealist habit of mind. Moreover, his incorrigible optimism made him apt sometimes to see facts as he would like them to be rather than as they were. But he was a master of his craft, a leader of men, and he left his mark on the administration of his own department. And he had a pride in the service which he never disguised.

Of Lee in his more personal relations it is difficult to speak. "Everything that he touched," says *The Times Trade and Engineering Supplement*, "he illumined with his own generous and contemplative nature." He had a singular charm of manner, a native gift of eloquence, a ready understanding, and a fund of humour that made him the most delightful of company. His boyish zest in life remained to the end: and if weighty and measured speech and sternly regulated thought are the marks of maturity, John Lee never quite grew up. But he leaves a gap that will not readily be filled and a memory that will be cherished in affectionate regard by all who knew him.

H. N. B.

GLASGOW NOTES ON MR. ARCHIBALD'S IMPRESSIONS OF AMERICAN TELEGRAPHS.

A GLASGOW correspondent writes:

That there was something to learn from American telegraph practice, and much to avoid, was the feeling of the large audience of telegraphists which listened to Mr. Archibald on the 15th ultimo. Glasgow telegraphists are independent and critical, but just as the proverbial Scot is supposed to look at two sides of his pennies, so are they prepared to listen to both sides of a question. Reports preceding Mr. Archibald's visit had not been favourable. One large centre had written of propaganda. Within a few minutes the lecturer had convinced his audience that he had no motive other than to pass on his recently acquired knowledge, and, when he concluded, the audience showed their appreciation of his efforts in no half-hearted manner. As was to be expected the hard-headed Scots were not prepared to accept some of the statements made: the extraordinary line stability provoked questions, questions arising from answers, and even cross-examination, but Mr. Archibald while cautious enough not to claim that everything he had been told was gospel truth, assured the hecklers that he had told them just what he had been told. That stability of lines and apparatus was of first importance to the Glasgow telegraphist was very evident, fully 90% of the questions bearing on it. The others were directed to the beautiful ladies who accepted telegrams at the big hotels over the pond. Why had the lecturer not shown a slide of them? The questioner was very disappointed, and so on. Lt.-Col. Westbury, Postmaster-Surveyor, presided, and wisely ruled as unfair several questions which might have involved Mr. Archibald in controversy.

CENTRAL TELEGRAPH OFFICE NOTES.

Promotions.—Messrs. W. K. Ware and R. P. Mitchell, Overseers to Assistant Superintendents; Miss H. M. Rimington, Supervisor to Supervisor (Higher Grade).

"F" Division Re-union.—Past and present members of the "F" Division spent a very pleasant evening on Jan. 18 celebrating the annual re-union of friends.

C.T.O. Veterans.—The annual re-union will be held on Mar. 16 at Andertons Hotel.

The City of London Male Voice Choir.—A concert has been arranged for Mar. 18, S.S.U. Concert Hall, Old Bailey, at 8 p.m. This choir is practically composed of all Central Telegraph Office men and has won a number of successes at the London musical festivals.

Influenza Epidemic.—Sickness is taking a heavy toll of the C.T.O. staff. On Feb. 19 a total of 466 officers, all ranks (excluding uniform staff) were absent out of a live force of 3,170. The 450 total has been exceeded on 6 consecutive days. The normal figure during the winter months is generally round about 150.

The "Centels" Operatic, Dramatic, and Orchestral Club.—"The Yeoman of the Guard" was presented at Cripplegate Institute at the end of January. A pleasing performance, denoting all-round efficiency, was given and quite a number of congratulatory critiques have appeared in service journals.

On Friday, Mar. 15, the Dramatic Section are presenting a performance of "The Happy Ending," by Ian Hay, at Cripplegate Institute. Tickets may be obtained through the Honorary Secretary, G. Dunthorne, C.T.O.

The Club is completing its programme for 1929-1930, full particulars of which will be given next month.

Honorary members will be welcomed, the annual subscription being 12*s.* 6*d.*, which may be made by instalments entitling a member to two tickets for any performance during the season. Past members of the C.T.O. are eligible for membership.

Sport.—Centels Sport Association.—The annual Dance will be held on April 12 at Victoria Hall, Bloomsbury. Tickets price 3*s.* may be obtained from the Honorary Secretary, D. W. Jones.

The Football Section visited Brighton and Horsham in January on a short football tour. Matches were played against both Post Office teams, the Centels proving victors in both cases.

Library.—The Annual Report and Balance Sheet for the year ended Dec. 31, 1929, once more denotes a satisfactory progress. There are at present 808 members and 2,902 books. There is no doubt that the Library is extremely popular. All classes are catered for—Highbrow to Edgar Wallace. The subscriptions are very reasonable, 1*s.* 6*d.* a quarter for one book, 2*s.* 6*d.* for two books, &c. Why go to any of the well-known circulating libraries when you can be catered for in your own office?

LONDON ENGINEERING DISTRICT NOTES.

Presentations.—Transfer of Mr. H. C. Gray, Assist. Engineer from South East Internal to Centre Internal.

A pleasant little ceremony, at which Mr. A. J. McNicol, the Sectional Engineer presided, was held recently at North Side, Wandsworth Common, when Mr. H. C. Gray, Assistant Engineer, was the recipient of a chiming clock, as a memento of his sojourn in the South West Internal Engineering Section, and as an expression of the esteem and affection which was felt for him by his colleagues of all ranks. Mr. Gray has been transferred to the Centre Internal Section after service in the South West Internal Section since its inception on April 1, 1924.

Representatives of all ranks in the Internal Section, External Section, and Technical Section, were present, and it was very difficult to confine the little ceremony within the limits desired because of the evidently urgent wish of so many to express their appreciation of Mr. Gray and their regret that he had to leave. Mr. Gray gracefully and effectively replied to all the accusations made against him.

Transfer of Mr. A. F. Lewis, Chief Inspector, from Centre Internal to Internal North East.

Mr. Edgerton, Sectional Engineer, presided at a gathering of the friends and colleagues of Mr. A. F. Lewis, to bid farewell to Mr. Lewis on his transfer. Mr. Edgerton said that it gave him great pleasure on behalf of those present to present Mr. Lewis with a barometer and thermometer in token of their esteem and goodwill. Mr. Edgerton also referred to the high esteem in which Mr. Lewis is held.

Mr. Lewis, in replying, expressed his regret at leaving so many old friends and wished them continued success.

Exchange Construction.—The following new exchanges were opened during the month of February:—

Exchange.	*Type.*	*Date.*
Pollards (Norbury)	Manual	Feb. 27.
Valentine (Ilford)	Manual	Feb. 28.

The Epsom manual board was transferred from Streatham to Sutton on Feb. 20.

GLASGOW TELEPHONE NOTES.

A SENSE of humour is one of nature's choicest gifts, and when this is unconsciously expressed it sometimes attains heights of brilliance that make the premeditated effort pale and anaemic by comparison.

Many moons ago a complaint was lodged by certain members of the Glasgow Night Operating Staff that the cleaning and dusting of their exchange affected their ability to render good and efficient service, because of the germ and dust laden atmosphere, causing them to cough and sneeze and so presumably to depart from the authorised operating expressions.

A zealous traffic officer was deputed to investigate and in due course he reported that he had visited the exchange and observed the conditions of which complaint had been made. The gem of the essay was to the effect that while he was present there were:—

"Two coughs (one per man) and one sneeze."

It is supposed that no further official action was taken but as the coughs and the sneeze were actual transactions it is to be hoped that in the following quarterly statistical record these were duly valued, the equating "E" factor applied, and the appropriate allowance made for dropped and end positions!!

On Tuesday, Jan. 22, the staff, or many of them, foregathered for music and dancing at the Locarno, Glasgow. A very enjoyable evening was spent, all present contributing to the mutual pleasure of the company. Amongst others we had Colonel and Mrs. Westbury, Mr. and Mrs. Coombs, Mr. and Mrs. J. Law and Mr. and Mrs. E. J. Johnson. The arrangements were in the capable hands of Miss H. B. Mowat, which will indicate all there is need to tell as to effectiveness and all round satisfaction.

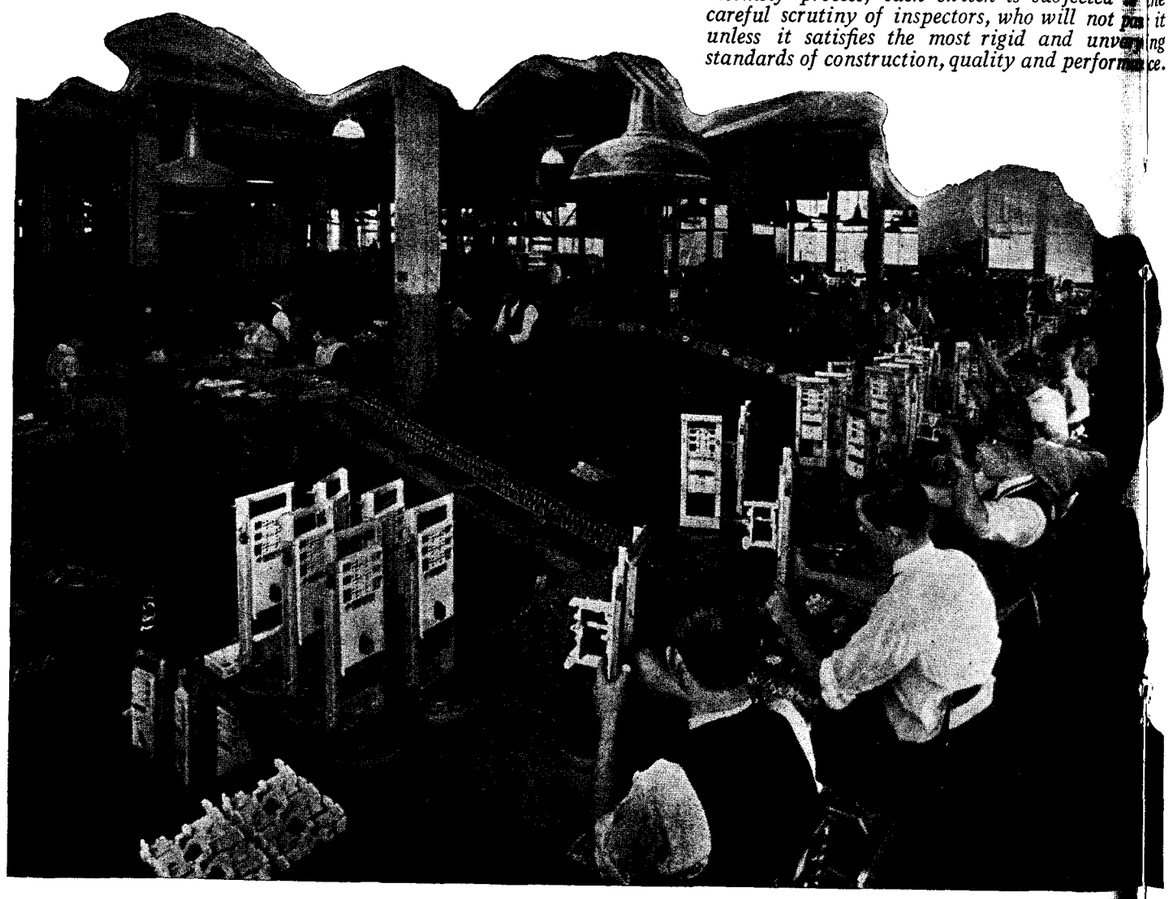
On Explanations.

"You are requested to furnish at once your explanation as to:" (P.O. Form P. 18B). "I'm kind of weak on explanations, partner. You figure it out your own way" (Brand). "Explanations usually are mistaken tactics" (Chisholm). "Explanations only lead to deceiving one or the other or both" (Goethe). "Thinner than a lawyer's explanation." "Lots of things is better just stated, an' not mussed up tryin' to be explained" (Wason). "Who explains, accuses" (French adage). "Facts are more important than explanations. Explanations may disprove facts" (Adams).

Maintaining Strowger Automatic Supremacy—

Progressive Assembly in Switch Manufacture

In the progressive assembly line shown below, while every facility is utilized to speed up the assembly process, each switch is subjected to the careful scrutiny of inspectors, who will not pass it unless it satisfies the most rigid and unvarying standards of construction, quality and performance.



THE accompanying illustration shows one of the switch assembly lines in the factories of Automatic Electric Inc., where selector and connector switches start at one end as bare frames and emerge at the other as practically complete switches. The various component parts which are mounted on the frame are fed to the operators by means of gravity rollers from assembly tables, where they in turn have been assembled. Because of the specialization of each worker upon one particular operation, this method insures greater uniformity of product together with increased speed of production, resulting in lowered costs.

This method of progressive assembly, which has been applied with great success in the automobile industry, has been used in various phases of Strowger Automatic equipment manufacture for many years with the highest satisfaction. It represents but one of the many improved production methods which have been worked out over a period of years by the efficiency experts of Automatic Electric Inc., who always have had as their object the ultimate lowering of cost to the purchaser, in addition to constantly maintaining every element of quality and performance for which this equipment is noted.

This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.

Automatic Electric Inc.

Factory and General Offices: 1033 W. Van Buren St., Chicago, U. S. A.

Sales and Service Offices in All Principal Cities

EXPORT DISTRIBUTORS

For Australasia--Automatic Telephones, Ltd.
Elsewhere--Automatic Electric Company, Ltd.

STROWGER AUTOMATIC

The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. MARCH, 1929. No. 168.

THE POST OFFICE GUIDE.

'WORKING copies of the Guide should be amended accordingly.' So every week the order goes forth; and in every city, town, village, and hamlet (at any rate, all hamlets that possess a Post Office) in England, Wales, Scotland, Northern Ireland, the Isle of Man, and the Channel Islands, it is recorded that deferred and letter-telegrams for Brunei may be in the Malayan language, or that telegrams for Maracaibo "via Trinidad and Wireless" are subject to delay. It may be that at Machynlleth (Mont.) they have never heard of Brunei; it is doubtful whether even in Manchester the counter-clerk would recognize Malay when he saw it; and one may question whether even at that fountain-head of telegraphic knowledge, the Central Telegraph Office, anyone could say with certainty whether a telegram in Malay consisted wholly of plain language and did not contain number-groups in excess of one-third of the words in the text. But if any sender presents a deferred telegram for Brunei in the Malayan language and that telegram is refused, or if he is allowed to cherish optimism about the Trinidad wireless route to Maracaibo, woe betide the counter-clerk!

But surely, the critic may argue, the counter-clerk, with many more serious things to consider, cannot be expected to keep such useless information in his head? The answer is twofold. First, the knowledge is not quite useless—if it were, there would be no need to burden even the Guide with it. Telegrams for Brunei and Maracaibo may happen very rarely, but they do happen; and it is the necessity for inserting in the Guide information that is almost useless but not quite that makes the Guide such a dull record. Secondly, the counter-clerk is not, thank Heaven, required to keep such knowledge in his head; the most that even an exacting Department requires is that he should know where to find it.

How far, then, does the Guide succeed in setting forth its information concisely and conveniently? That is a question that the counter-clerk can best answer; but one may suspect that the counter-clerk, whose misfortune it is to have to refer frequently to the "Table of Charges for Imperial and Foreign Telegrams," might be extremely scathing in his criticism of its anonymous authors. One can only plead in their defence that although the rates for overseas telegrams become more complicated every day, the table in which they are set forth is less complicated than it used to be, and less complicated than in many similar publications in foreign countries. If any critic thinks the work is badly done, let him try to re-arrange the matter for himself before he voices his criticisms.

The main difficulty is that the Telegraph Companies, and indeed the Department itself, continue to shower benefits on the public in the shape of new "services" (that poor overworked word!), and every new service is an additional complication to the counter-clerk. In the aggregate they are possibly not an unmixed blessing even to the public; every big business firm nowadays has a special "Cabling Section," thus confessing that the intricacies of the subject are beyond the comprehension of the amateur. Only a few weeks ago a reduced scale of charges was introduced for night-letter-telegrams to North America; the point at which the reduced scale begins to apply depends on the number of words and varies according to the telegraph "zone" of the office of destination. Altogether the system does not lend itself to very simple expression; and as we go to press there are rumours of further complications still to come. Before very long we shall be faced with the problem of setting forth the new tariffs for code-telegrams.

One thing must be steadily borne in mind. The growing complexity of the overseas telegraph service does bring with it substantial gains to the public; it makes it easier for British trade to capture foreign markets, it makes it possible for not too wealthy people to use the system as a means of social and commercial intercourse. It is arguable that still greater advantages would be gained by a drastic simplification of the whole system of tariffs; but to achieve this object at this stage, while conserving for the public all their present gains, would be a herculean task. In the meantime the counter-clerk can do much to guide the sender through the labyrinth.

We have written of the Post Office Guide from a very narrow angle. But the part may serve to illustrate the whole. We have tried to show that, while the work of those who have to use the Guide is difficult, the work of those who compose it is not altogether easy. Though we gain small thanks from the public for the intricate "correction-slips" that are issued in our endeavours to serve them, let us at least commiserate one another for our joint sufferings in a noble cause.

COMEDY AND TRAGEDY.

SOME stories have recently been current in the Press—they are more or less perennial—of the abuse of the telephone by practical jokers and by persons of more nefarious character whose aim is to decoy people from their houses in order that these may be entered and robbed with comparative impunity. Such abuses are, of course, no more peculiar to the telephone than to any other system of communication. The benefits of the telephone, the telegraph, the express train, and the motor-car fall, like the rain, equally on the just and the unjust. It is a kind of left-handed testimony to their popularity that their aid is readily sought by the criminal and the cad in their unsocial exploits. If, however, the housebreaker has sometimes been known to turn the telephone to his advantage, it is more often enlisted against him, and is, in general, one of the best forms of burglary insurance which the householder can possess.

American journals often favour us with exciting accounts of the ready-witted action of telephone operators who get an indistinct or half completed signal from some subscriber in distress, and, guessing that something dramatic is toward, dispatch the police to the scene of action in the nick of time. It was possibly under the influence of some such stirring tale that a Paris telephonist recently exercised what the *Daily Telegraph*, in its account of the incident, describes as a "too vivid imagination." He was on duty, we are told, at the Mercadet Exchange, one of the busiest in the city, when he received a call at four a.m. from a subscriber in the Rue Caulaincourt. He took up the receiver, but heard nothing at first. Then a sound suggesting a violent commotion struck his ear. This was followed by what he believed to be a woman's cry of anguish, lasting several seconds. The lamp at the exchange was extinguished. The person making the call had hung up the receiver.

The telephonist was convinced that a drama was being enacted, and that a woman, finding herself in danger, had as a last resource, called for help by telephone. All was, therefore, proceeding on classic lines. He immediately got into communication with the police station in the Passage Tourlaque and reported what he had heard, at the same time expressing his fears that a woman was being done to death.

A few minutes later two cyclist policemen called at a flat in the Rue Caulaincourt, and were received by a man in a jovial humour. They found a jovial company. Then the tenant of the flat explained what had happened. One of the guests had upset the telephone instrument, and, when it fell to the floor, a young woman broke into a shriek of laughter which the imagination of the telephonist transformed into a cry of distress.

Several morals might be drawn from this little story. One is that it is but a step from the sublime to the ridiculous, or, shall we say, from the tragic to the comic, and that a commendable promptitude which would be rewarded with official encomiums in one set of circumstances only earns unfeeling laughter in another. For the action of the telephonist was undoubtedly praiseworthy and was intended to forestall a tragedy. Despite its ludicrous *dénouement*, it was conceived in the proper spirit of public zeal. Too vivid an imagination is better than dull-witted indifference or a timid repugnance to making oneself look foolish. Who can say how many tragedies are enacted because those who might have averted them are either too slow to grasp the situation, or else hesitate to interfere from a dread of making a blunder.

HIC ET UBIQUE.

TELEPHONE service between this country and Poland was inaugurated on Feb. 15. It is confined at present to communication between London and Warsaw.

Telephonic communication between Paris and Buenos Aires was officially inaugurated on Jan. 30 by M. Briand, who held a conversation with the Foreign Minister of the Argentine Republic.

The charge, says the Central News, will be £6 5*s*. for a three-minute conversation, and two guineas for each additional minute.

Under new arrangements which lately came into operation, all telephone exchanges throughout France with more than 200 subscribers are now provided with both night and day services. No fewer than 170 exchanges are affected by the new order, bringing the total provided with a 24-hour service up to over 300 exchanges.

We also learn from the Central News that telephone rates in France are to be raised in consequence of the deficit shown in the past. Government officials are of the opinion that the telephone system should be made self-supporting as in Britain and the United States.

According to the *Southwark Diocesan Gazette* one of the clergy attached to St. John's, East Dulwich, had something of a shock a few weeks ago. He was at home feeling exceedingly ill. The doorbell rang, and as there was no one else in the house to answer he dragged himself downstairs. In front of him stood a burly British workman, who said in sepulchral tones, "I've come to put you underground." The clergyman gave a start and then stammered "I—I—I—beg your pardon." "Can I start at once," said the visitor, "I'm from the Post Office to put your telephone line underground." "Oh, certainly," said the priest, "I thought you were a gravedigger."

The circumstance that the new exchange at Kenton is to be called "Wordsworth" has moved a poet in the *Evening Standard* to write some verses concluding with the following happy lines :—

After the customary wait
I heard an answer to my call,
And murmured "Are you Wordsworth 8?"
A pleasant voice, but one so small,
It might have come from highest Heaven,
Replied, "Wrong number. We are 7."

There is trouble in Chicago because some of the hotels charge 10 cents to their guests for a 5 cent call. The Illinois Commerce Commission point out that by their regulations and the Chicago City ordinance it is forbidden to subscribers or lessees to charge more than 5 cents for a single local message. The hotel people explain that they only charge 5 cents for the calls—the other 5 cents is for "service." They evidently have their own ideas of the great American ideal—"Service."

According to the annual report of the Polish Administration for 1927 there were 79,122 km. of telegraph wire in use at the end of that year. 14,547,203 telegrams were handled of which 1,935,426 were international messages. The total number of telephone subscribers was 111,721, and of telephones 146,420. Of the latter 82,585 belong to the State system and 63,835 to the telephone company's system.

NOTE.

WE hope to publish in our next issue Mr. G. T. Archibald's paper, "Impressions of the American Telegraph Systems," which he has read to several gatherings of the provincial staff since giving it in London.

Several interesting articles are held over this month owing to the pressure on our space.

COMMISSION CONTROL OF PUBLIC UTILITY SERVICES.*

BY A. J. WALDEGRAVE, ESQ., M.B.E.

ONE of our legislators, a few months ago, when pressed to give a definition in circumstances which were difficult, escaped from his difficulty by saying that although he could not define an elephant he knew one when he saw it. It is perhaps unnecessary to go much further in defining a public utility service—or, adopting the abbreviation of the Americans, a "public utility" simply; we all recognise railways, water supply, gas, electricity, telegraphs, telephones, &c., as services of this nature. It is worth while, however, considering a little closely the distinctive feature which marks off these services from the many other services which people render to one another on a commercial basis and which make up the main sum of business life. The public utility is characterised by the fact that it combines the two features of being a necessity of civilised life and of tending inevitably to become a monopoly.

The large-scale system of interdependence which we call modern civilisation could not continue without the existence of services of this kind as the very skeleton of its structure. Excellent types of human life may be possible without water-mains or railways or telephones, but they must differ greatly from life as we know it in our present environment. The public utility is the link which the individual cannot forge for himself, yet which, under modern conditions, is essential to his life as a member of the community. And not only the individual but every social group and commercial company is dependent on the services of this nature; contact with them is vital.

But "necessity" is not sufficient as a distinguishing mark of the public utility. Linen collars and silk stockings, for example, may be necessities of civilisation but the organisation which exists for the provision of them, and the frequent renewal of them, does not rank as a public utility service. Another element must enter for this purpose, viz., the element of monopoly. Or, perhaps I should say, of tendency to monopolistic conditions; for the services which are now recognised as public utilities did not spring into existence as complete monopolies and have not in all cases even to-day attained the position of secure and unassailable monopoly.

Consider the railways. These have a long history of competitive activity, a history which, as we shall see presently, has left its mark on the development of the system of Commission control, which is the subject of this paper. And although the rivalry between the great main lines in Great Britain has now, under the grouping arrangement, been refined into a sort of pictorial poster competition, a new phase of competition has been entered upon with the development of motor transport. In spite, however, of competition, there has always been a large element of monopoly in the position of the railways.

Similarly with the other public utilities. Gas and electricity have been subject to competition, the one by that of the other. Trams have had to face the attack of motor-buses; telegraphs have yielded much ground to telephones, and cables have been forced to come to terms with wireless (terms, the discussion of which would, I apprehend, be ruled out of order by the Chairman). Water, perhaps, has had no rivals (for we can scarcely count the efforts of brewers and distillers) and stands out as the type, *par excellence*, of a public utility, combining the two elements of necessity and monopoly. But even in the case of the several other services mentioned, the existence of the competition of substitutes or of potential supplanters does not alter the fact that they are essentially monopolistic—always in tendency and often in actual operation.

This monopolistic character is sometimes created by law—as in the case of the postal service, which, although we may find some difficulty in realizing it, is not a natural monopoly but an artificial one. In general, however, the public utility is a natural monopoly. A very clear instance is that of the telephones. The practical impossibility of the existence of more than one telephone system in a locality has been demonstrated by history, and the monopoly which exists to-day in this country has rather been appropriated than created by the State.

The case of telegraphs is not quite so clear. We were reminded in the paper read at the last meeting of this Society that in America rival telegraph systems do in fact exist and flourish side by side. Whether they will continue to do so remains to be seen. That they are able to live in competition with one another at all is because telegraphs do not exhibit in quite so marked a degree as other public utilities, the factor which in general enables such services to occupy a position of monopoly. That factor, giving the public utility its pull, is the operation of the service by means of a large fixed plant, tied to the locality in which the utility operates. In the case of a telegraph system, the plant, essential as it is, and spectacularly prominent though it may be, is *relatively* a small factor in the cost of running the business. But in the case of telephones, of railways, of electricity supply and other utilities, the plant costs in relation to other costs are so high that competition, which involves duplication of the plant, is difficult to institute and maintain. Moreover, in some cases there is physically not room for more than one enterprise, as, for example, in the case of a tramway, or in that of a water company, where there is only one practicable source of supply.

* Paper read to the Post Office Telephone and Telegraph Society of London.

Even where there is no physical restraint on duplication or multiplication of services it may be uneconomic to have more than one service in the field, and in those circumstances the tendency to monopoly is bound, more or less quickly, to assert itself.

It is important, however, to realise that, given due safeguards, it is to the interest of the users of the service that monopoly should exist. During the development of the modern conveniences which are now called public utilities it has become increasingly evident that too high a price may be paid for the benefits of competition and that it may be of advantage, even to the consumer, to eliminate the overlapping and the wastefulness of rival systems and to let the control of the service be in the hands of one concern.

The advantages of monopoly are not, however, likely to accrue to the consumer unless steps are taken to secure his interests—which are naturally in conflict with those of the owners of the monopoly. There are, it is true, incentives operating to induce even the monopolist to cheapen service in order to attract as much as possible of the patronage of the consumer, but if the service which he supplies is a necessity he may find it easier to make profits by providing an indifferent service at exorbitant rates than by providing an efficient service at low rates. Under monopolistic conditions, with the making of profits as the primary object, there can be no guarantee that the conflict of interests between the exploiting company and the user of the service will be equitably adjusted by the mere operation of economic forces.

Various methods have been devised of avoiding the conflict or of reconciling the interests of the antagonists. One such method, which is in operation to a considerable extent in this country, is that of public ownership, either by the State or by the local authority. It is not the purpose of this paper to enter upon, or to provoke, a discussion of the principle of nationalisation of public services. As members of this Society, we are all engaged in trying to promote the higher efficiency of a State-owned service, but that is on professional and not on political grounds. Whether our special position is calculated to make us better or worse judges of the general political issue I should not like to say. Successful treatment of the problem by the nationalisation method is clearly dependent on the existence of a high level of political intelligence and probity in a community, and it is scarcely necessary for us this evening to discuss such interesting questions as to whether the British public gets a better or a worse service than it deserves, or whether the distrust of State-ownership in America is a reflection on the quality of American political institutions. Let it suffice for the moment that public ownership is one way of dealing with monopolistic conditions.

Another method of dealing with those conditions is by setting up an authority like the Port of London Authority or the Metropolitan Water Board, which does not dispossess the holders of the stock but which eliminates the speculative element from the enterprise and fixes rates with consideration, to the best of its judgment, of the various interests concerned. So far as incentives to enterprise and efficient management go, an authority of this kind is in much the same position as a Government Department, except that it is free from direct political interference.

In this connexion, it should not be overlooked that the mere apprehension of being displaced by a State or municipal service or an *ad hoc* authority, may be a deterrent against extortion and inefficiency on the part of a public-utility company.

Apart from such apprehension, attempts at restraint on the abuse of its privileges by a public-utility company have, in this country, usually taken the form of provisions in the Act of Parliament authorising its operations or in the licence from the local authority enabling it to work; and it has not been uncommon for these provisions to contain restrictions on the rates which may be charged. That is to say, maximum rates have been fixed. But in these cases the maximum has generally turned out to be too high to constitute any effective check on abuse of the monopolistic conditions. It is in the nature of things that a maximum rate should be higher than is really necessary; and a new invention or a development of technique may soon render it quite ridiculous.

In the gas industry a system of controlling rates in the interest of the consumer by means of a sliding-scale system has been introduced and this system is in operation in the case of most of the larger companies. The scale usually adopted is that called the London Sliding Scale, which was introduced in 1875, providing that for every penny of reduction below the standard price the gas company might pay $\frac{1}{4}\%$ above the standard dividend.

The principle of the sliding-scale system is that there should be an automatic division of good results between the company and the consumer; and in recent years there have been several notable developments of the idea of applying this principle to more complex utilities than the gas industry.

Under the London Electricity Acts of 1925 provision has been made for application of the sliding-scale principle to the supply of electricity. Standard prices are to be fixed, being finally determined by the Electricity Commissioners, if necessary, and if lower prices are actually charged, giving rise to what is called "consumers' benefit," a sum equal to one-sixth of this consumers' benefit may be added to the dividend payable by the Company.

In the Railway Act of 1921, which reorganised the railway system of this country, the net revenue of the year 1913 was taken as a standard and it was provided that one-fifth of any profit earned in excess of that standard might be added to it, while rates should be reduced so as to aim at eliminating the other four-fifths in future years. If, however, the profits grew further the process would be repeated and the standard net revenue again increased;

and so on. So far, as is well known, the companies have not yet succeeded in earning up to the 1913 standard.

The same principle of sharing results is embodied in an arrangement made a few months ago for a new steamer service to the Highlands and Islands of Scotland, but with the omission of any provision for an increasing standard of profits. In this case, half the profits above 6% are to be paid to the steamship company and the other half paid into a contingencies fund. This fund will be used to level up the earnings in lean years, and every two years the rates charged are to be reconsidered and an effort made to adjust them so that the balance in the fund will be kept at a certain comparatively low level. A more recent case still is that of the Imperial Communications Company, which is to take over the Beam Service and the Imperial Cable Service of the Post Office, as well as the service of the Pacific Cable Board. In this case an amount has been fixed as the standard revenue, which will yield approximately 6% on the assessed value of the capital assets of the company. If this standard is exceeded, one-half of the excess will be taken by the Company and the other half will be devoted to the betterment of the service to the public, presumably, in ordinary course, by reduction of rates. But the detailed arrangements are still under discussion. When these arrangements are completed they will constitute the latest attempt to reconcile by means of the sharing principle the interests of the consumer with those of a company in the carrying on of a monopolistic service.

In the United Stated the problem of the public utility has been approached in a distinctive way and the history of the efforts to find a satisfactory solution does not run parallel with the corresponding efforts in this country. In order to understand the direction which they have taken it is necessary to know something of the political constitution of the half-continent which we call the United States. In particular, it is necessary to appreciate the fact that the separate States in uniting into a federation, retained a very large measure of autonomy, of which they are very jealous. It is not easy for us in England to realise that the division into separate States is much more analogous to the division of the British Empire into Dominions than it is to the division of England into counties. Such, however, is the case. Moreover, it is necessary to remember that when the federation was formed the rights of the individual citizen, in whatever State he might reside, were in certain respects defined and guaranteed by a written constitution. One of the provisions of the constitution is that "no person shall be deprived of life, liberty or property without due process of law; nor shall private property be taken for public use without just compensation"; and another provision is that "no State shall pass any law impairing the obligation of contracts."

The inviolability of the constitution is guaranteed by the Supreme Court, sitting in Washington, to which appeal can be made against any breach of the constitution, either by one of the States or by the central Government itself. Each State has its own legislature and its own courts of law and, except in matters where, under the constitution, it has definitely surrendered its powers, exercises self-government.

Across this vast territory of America, this huge network of semi-independent States with their unique constitutional and judicial system, came the nineteenth-century stream of expanding population, bringing with it, besides certain habits and institutions which are of no particular interest to us this evening, two features on which we must concentrate our attention viz., rapidly developing railways and the English common law.

The development of railways was the very life-blood of the invading civilisation. Agriculture, which was the prime interest of the new communities was dependent upon railways in a supreme degree, and every inducement was given to promoters and speculators to push ahead with their schemes. Railway communication at any price was the order of the day. Lines in all directions, with much overlapping and competition, were projected and constructed, and for a time no regard was paid to the dangers of exploitation and monopoly on the one hand or to those of unnecessary and expensive duplication on the other. But after a while farmers and traders, who constituted the bulk of the community, began to realise that all was not well with the railway system on which their business life depended. And many of them were stung by the loss of savings which, during the boom, they had invested in ill-considered or mismanaged railway schemes. (It is worthy of note that 70% of the railways in the United States have, in the course of their development, gone through the process of liquidation).

Complaints were loud of extortionate rates and of discriminatory rates. The latter kind of complaint, i.e., of discriminatory rates, arose mainly from the fact that at points where a railway company was subject to competition it instituted lower rates than at points where it held a monopoly. The farmers at the latter points saw their rivals getting their crops to market on more favourable terms, but no remedy was available. There was discrimination against districts as well as against individuals, with corresponding patches of discontent.

It might be supposed that the public at the points where lower rates prevailed because of competition would be happy; but they did not long remain without grievances. For naturally a disposition among the competing lines towards working agreements and more or less close amalgamation set in, and the flame of indignation against the railways was fanned by this tendency towards combination.

Out of the general discontent grew up a movement for control of the abuses connected with the railways, and this movement expressed itself in the appointment by various States of commissions to deal with the matter. At first these commissions were of an investigatory and advisory character only: they were given power to prosecute enquiries into the management of the companies and to publish the information; and reliance was placed on the force of public opinion in bringing about reform. Soon, however, some of the Western States, with traditions no doubt of the virtue of encouraging the pianist by shooting at him, began to turn these advisory commissions into mandatory ones, with power to fix rates and to impose conditions of service.

As soon as this happened there arose the question of the legality of such interference with the freedom of the companies to conduct their business according to their own wishes; and so began a long course of litigation on the subject of the control of public utilities, which, as we shall see, is not finished yet. The issue of the right of the States to interfere at all with the rates charged by a public utility company was fought out in what is known as the Munn case in 1876. The State of Illinois had ordered a reduction in the rates charged by a company in Chicago for the storage of grain in the great warehouses, called elevators, which were an adjunct of the railway system connecting the West with the East. The case went through to the Supreme Court and it was held by the court that the relations of traders with the company came within the scope of the Common Law, which from time immemorial had recognised that some sorts of business are in a special way "affected with a public interest" and if carried on at all must be carried on with due regard to that public interest. The occupation of common carrier was a business of this kind, and the railways must accept the liability to Government regulation which their special character as common carriers involved. It is interesting to note that telegraph and telephone companies have since been formally declared to be common carriers and to come under this ruling.

Although the legal right of regulation was thus established there was for a time a reaction against mandatory proceedings on the part of the commissions and a hesitation to harass the companies, which were in the throes of a financial crisis. But the tendency towards regulation reasserted itself and the struggle was again carried to the courts. The case *Smyth* v. *Ames* is the next landmark in the history of regulation of public utilities in the United States. The case reached the Supreme Court in 1898, and in its judgment the court pronounced the formula which thereafter became the foundation principle of all legislation and administration in connexion with the control of public utilities, viz., that these utilities are entitled to "a fair return on a fair value"—that, fully that, but nothing more.

In giving its judgment the court said: " . . . the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity of the company under particular rates prescribed by statute, and the sum required to pay operating expenses . . . are to be given such weight as may be just and right in each case. We do not say that there may not be other matters to be regarded in estimating the value of the property. What the company is entitled to ask is a fair return on the value of that which it employs for the public convenience. On the other hand, what the public is entitled to demand is that no more be exacted from it for the use of a public highway than the services rendered by it are reasonably worth."

It was a substantial gain to the movement for regulation to have it established that the formula, "a fair return on a fair value," was to govern the relations between the public and the companies, and that there was nothing unconstitutional in the provision of administrative machinery to ensure the application of this standard; it was not fully realised at first how ambiguous and how difficult of application this simple principle is, and what an amount of dispute was possible on the two questions, "What *is* a fair value," and "What *is* a fair return on it." The development of the commission system went on and the commission took definitely the mandatory form.

For a good many years now, commissions have been established in all the 48 states of the Union except the small state of Delaware; and their method of functioning is similar throughout the country, though they differ in the extent to which the appointments are influenced by political considerations and in the quality of their personnel.

Primarily the commissions represent the public interest and are only semi-judicial in character, i.e., they are concerned to defend the public against the encroachments of the companies, the assumption being that in general these are well able to look after themselves, particularly as they are able, if they dissent from a decision of the Commission, to appeal to the courts on the ground that the decision amounts to confiscation. For that is the constitutional procedure. The order of the commission may be appealed against, first in the state courts, and, if that is not successful, in the Supreme Court at Washington, as confiscatory and therefore unconstitutional. The courts do not themselves fix rates. The commissions employ a staff of engineers and accountants to advise them on cases, and do not adopt the purely judicial attitude of listening to experts called by the respective sides and then—well, doing whatever it is that judges do when faced with diametrically opposite views from equally eminent experts.

In theory the commissions have the right to initiate enquiries, but in practice the enquiry originates either in complaints from the public or in an application by a company. From whichever side the application comes, the investigation is carried out in public and with all the forms of law. Evidence is taken with all the solemnity of an ordinary court of law and is available if there is an appeal and the case actually goes forward to the courts. It seems a cumbrous and expensive procedure, but at any rate it ensures full publicity, and that is an important consideration, perhaps the vital consideration, where the issue lies between public interest and powerful private interest.

(To be continued.)

CORRESPONDENCE.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—As a Postmaster at a small office for over 30 years, I suggest the primary cause of the decay in matters telegraphic is the cost of the messages.

When telegrams were sixpence and postage one penny, people did not hesitate to send telegrams as they do now, they reckoned the cost of the telegram at fivepence. It was easy and cheap to send telegrams, and the service was popular.

The telephone has largely supplanted the telegraph owing to the fact that it puts people into direct touch, thereby saving time, especially on short distance calls.

Long-distance calls are made only when the business is very urgent, and these are not always satisfactory, as there are considerable delays and annoyances in getting effective connexions. Telegraphs and telephones are not, or should not be, antagonistic services.

There is room and necessity for both, and each should be adjusted to fit into the other so that the best might be obtained from them.

The telegraph plant exists as an effective communicating machine. To scrap it would be wasteful in the highest degree.

Telegraphs and telephones are run as separate departments. I suggest they should be under one control. The tendency of dual control is to lose a sense of the relative values of each undertaking.

A large expense falls on telegraphs, as staffs have to be kept to meet the business which may or may not come along.

It would be more profitable to keep the staffs employed on cheaper telegrams.

A sixpenny rate might not be justified all through the day, but as in telephones, the rates could be varied according to the busy or slack periods and the distances.

I venture the opinion there would be no loss if the service was made cheaper as the increased turnover would balance the position.

Only an experiment for a period can prove whether there would be loss or gain from a reduction. It would be worth while to try.—I am, Yours faithfully,

"SMALL OFFICER."

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—I should like to submit the following comments apropos of the "Technical," "Operating" and "Traffic" sections of the article by "A C.T.O. Telegraphist."

The Teleprinter No. 3 has a speed of 60 words per minute, or 3,600 words per hour. This is equal to 257 messages simplex and 514 messages duplex, where the average telegram is 14 words per message, excluding preamble.

If, therefore, traffic existed and there was no need to time, check, and record receipt of the telegram an ideal circuit would carry an enormous volume of work per hour.

We have, however, recently heard that totals of 80 to 100 messages are possible with a certain amount of concentrated effort, and this presents the fact that such totals represent only in actual "paid time" 20 and 27 minutes, respectively, of each hour. The remaining period of the hour appears to be a liberal margin for the non-manipulative part of the work in connexion with each message.

I would, however, like to add that the speed of the Teleprinter, 60 words a minute, is high with very long circuits and that if it were dropped to 50 words per minute to suit, say, a cable 300 miles long, greater stability would result with no reduction in speed of disposal of traffic. Keep the speed of the Teleprinter as high as possible with short lines, but reduce it as the circuit lengthens beyond, say, 200 miles. I believe the result would increase stability.

The writer remembers that it was difficult to fix a higher speed than 50 words per minute each way at Wheatstone Duplex on a 300-mile cable loop, and that the Morkrum instrument speeded at 40 words per minute was decidedly more stable on that circuit than a Teleprinter No. 3 at 60 words per minute.

Regarding "Traffic," motor omnibus services have also reduced the short-distance telegram, just as they have affected short railway journeys in the provinces, and to-day the percentage of racing telegrams is very small in the afternoons as compared with 6 or 8 years ago. The racing and Press traffic filled the afternoon, whereas to-day we find little of either, and no canvassing will bring that work back again.

What, then, can be done? So long as loss in connexion with telegrams exists, increase of traffic will increase that loss. It is, therefore, up to telegraphists, if they can, to suggest a means of reducing the existing loss. Handling more and more telegrams per minute or hour, either by machine or other effort, would no doubt be the ideal solution.—Yours faithfully,

Carlisle, Feb. 12. CANDID.

THE AUTOMATIC MULTIPLEX.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—Dislocations due to travel have prevented me from seeing until now the letter of A.C.B. about the Automatic Multiplex in your issue of December, 1928. Like the author of that letter, I am keen about historical accuracy in matters telegraphic, and I notice that some of A.C.B.'s corrections need further correction.

The famous old pessimist, Ecclesiastes, the preacher, said: "There is no new thing under the sun. Is there anything whereof it may be said, See, this is new? It hath been already of old time, which was before us." In one respect at least Ecclesiastes was wrong. *Success* is always new, and it is customary to give credit to the man who succeeds, and not to those who fail. Quite a number of people attempted to make an automatic multiplex, especially in America, but they all failed, just as the Baudot Automatic Multiplex failed, because certain elements of success were not supplied by them, and were supplied in the Murray Multiplex. To mention just one, there is the start and stop for the Murray tape transmitter, automatic as well as manual, so arranged as to stop between the transmission of letters. That was a new and essential printing telegraph device. The Baudot machine made no interlocking provision, manual or automatic, for starting or stopping the transmitter at the right instant. How could an automatic multiplex be successful without that element? There was also the application of the phonic drive to the Murray Multiplex distributors, an important feature, and a number of practical details about which it is not necessary to trouble your readers; but I may mention the importance of speed in the keyboard perforator. The Murray keyboard perforator is exceedingly rapid. The Baudot keyboard perforator was not speedy. It was also clumsy and badly designed and punched square holes. The transmitter was a sliding contact device, with no practical durability about it. If the Baudot Automatic Multiplex was successful, why didn't the French Government adopt it, and why was it not adopted by the British Post Office after the purchase of a set by Colonel Booth on behalf of his administration in 1907?

A.C.B. says that the Baudot set purchased for the Post Office in 1907 was shown to me soon afterwards, with the result that I abandoned my perforator, which had a feed of half an inch per letter and was used on my high-speed automatic system, and adopted the method of cross perforations with a feed of one-tenth of an inch, as in the French instrument.

That statement is not correct. I retained my lengthwise perforated tape until 1912, five years afterwards, when I sold my American rights to the Western Union. My object in retaining the lengthwise perforated tape was to enable the same tape to be used on both the Murray Automatic and Murray Multiplex. In 1912, when the Western Union bought my American Multiplex rights, the Postal Telegraph Company held the American rights to my automatic system, and in these circumstances I recommended the Western Union to use cross perforated tape, as there was nothing to be gained in that case by adhering to the more expensive lengthwise perforated tape. There was nothing new about cross perforated tape, even for automatic printing telegraphs, nor were the dimensions new. Several American inventors used almost identically the same cross perforated tape before me, and so did the Scottish inventor, A. J. Forbes, at a still earlier date. In all these cases the Wheatstone tape dimensions seem to have been adopted. I took the Wheatstone as my standard, and not the Baudot tape. Indeed, I think A.C.B. is also in error in stating that the Baudot tape was spaced 10 to the inch. The Baudot tape had square holes and it was considerably wider than the Murray Multiplex tape, which is now standard practically everywhere.

It is an historical fact that the Automatic Multiplex was not a success until my inventions were applied to it. Then it became a very great success. I have testimony to that effect from the Western Union, and if A.C.B.'s official duties had permitted him to accompany the G.P.O. Telegraph Commission of Enquiry that went to America last year, he would have seen just how great that success has been. It is only fair to the Western Union engineers to say that they added many other important improvements to the automatic multiplex, more than sufficient to justify the title of the Western Union Multiplex; but it was the Murray Multiplex inventions that first made the Automatic Multiplex a practical success.

If, as A.C.B. asserts, the French Telegraph Service must be given the honour of being the pioneers of automatic multiplex working, why is it that the French Telegraph Service is now giving orders for Murray Multiplex keyboard perforators and tape transmitters, and is not using the Baudot keyboard perforator and tape transmitter made by Carpentier in 1907?

If *first success* justifies the claim to pioneership, then Mr. Stuart Jones was correct in saying that the Murray Multiplex was "The pioneer of automatic multiplex." In the Law Courts in Great Britain and the United States and other countries, one of the criteria of invention is first success, and it is a matter of telegraph history that the Murray Multiplex was the first successful Automatic Multiplex. In precisely the same way the Morkrum Teletype was the first successful pioneer of the start-stop printers. The Teletype succeeded because it contained certain inventive elements that were lacking in its predecessors. It is generally agreed that the Teletype was the pioneer start-stop printer, and the Murray Multiplex is in exactly the same position in regard to the automatic features. Success is the legal and logical and commonsense criterion of pioneership.

A.C.B. states that "the American authorities" obtained the requisite Baudot apparatus for America from Elliott Bros., the obvious insinuation by A.C.B. being that it was from the Baudot system that the Western Union developed their multiplex. I can only characterise that insinuat on by saying

that it is not only untrue but unfriendly, and it gives me an unpleasant impression that there is a desire on the part of A.C.B. not so much to ensure historical accuracy as to gratify personal malice by belittling my work. The Western Union bought two Baudot distributors, but did not get satisfactory working from them until, on my advice, they applied the phonic drive ; then they went well. No " American authorities," to my knowledge, experimented with more Baudot apparatus than these two distributors, and the Western Union afterwards developed their own distributor on entirely different lines from the Baudot, but retained the vital phonic motor drive.

A.C.B. raises an issue of more general interest to telegraph engineers when he says that the permanent duplex arrangement for the Baudot devised by the British Post Office was also adopted by the Americans as well as by Mr. Murray. I am afraid this is a case in which Ecclesiastes was right. Of course Ecclesiastes and I may both be wrong, and duplexing the Baudot may have involved some new inventive element. To settle the question, perhaps A.C.B. will inform the telegraph world exactly what Colonel Booth invented when he " duplexed the Baudot " ? Would he also explain how it is possible to duplex any printing telegraph apparatus whatever ? I had an impression that duplexing applied only to the telegraph *line* and to the main line relay, and not to the *apparatus*, and that duplexing the line had been done already of old time. Also I have an *Ahnung*, or presentiment, or clairvoyant impression, that the Rowland Multiplex was working commercially with the duplex balance, and that I saw it so working, long before Colonel Booth " duplexed the Baudot."

Apparently A.C.B. thinks I couldn't invent a door knob. I return thanks for the compliment, and by way of proving that other people besides D.M. differ from A.C.B., I may, perhaps, be allowed to make the following quotation from a letter I received from Mr. G. M. Yorke, Vice-President for Engineering, Western Union Telegraph Company, when I retired from business in 1925 :—

" This may be a good time to express again our appreciation of the invaluable help which you and your principles were to us in getting started on our Multiplex career in the right way. By getting started in the right way and at the right time, the Western Union was able to carry its war burden with credit, where otherwise I fear there would have been most serious embarrassment."

Some of these days, if I get time, I may write my autobiography. If so, I shall have more space and more latitude for expressing my views about inventing doorknobs and duplexing the Baudot.—Yours faithfully,

DONALD MURRAY.

[NOTE.—We have shown this letter to our correspondent " A.C.B.," who wishes us to make it clear that, in correcting what he regarded as misstatements of fact in Mr. Stuart Jones's paper, he did not intend to make any attack on Mr. Murray.—ED. *T. & T. Journal.*]

MANCHESTER NOTES.

Lectures.

ON Jan. 23 and 24 a series of two lectures on " Automatic Telephony " were given by Mr. J. L. Parry (Traffic Superintendent). The lectures were part of the scheme to afford some elementary knowledge of " Automatics " to the Contract Officers and Clerical Staff, and on each occasion an audience of approximately 140 attended and were well rewarded by an excellent exposition, illustrated by lantern slides, of the principles, not only of the " straight " system but also of the " Director " system, which is to be installed in the Manchester District, the first provincial district to be catered for in this respect.

That such instructive lectures were appreciated by members of the staff, who have little opportunity of becoming acquainted with the latest developments in telephony, was evinced by the numerous questions put to the lecturer after the reading of the papers and the eagerness displayed at the demonstration of automatic apparatus.

At the end of the second lecture, Mr. Godfrey (Staff Officer), deputising for Mr. Whitelaw, the District Manager, who had to fulfil another engagement, proposed a very hearty vote of thanks to Mr. Parry for the admirable lecture he had given and for his very clear explanations in response to the questions asked, and this was carried by acclamation. Mr. Parry replied in suitable terms.

Resignations.

Miss M. James, Writing Assistant, who resigned the service on Jan. 26, for the purpose of entering a convent, was presented by the Staff of the Fees Division with a suitcase.

Miss D. E. Moorhouse left the service on Feb. 9 on the occasion of her marriage, which took place on the 11th instant. A very handsome canteen of stainless cutlery, subscribed for by the staff of the District Manager's Office, was presented to her and many beautiful gifts from her special friends amongst the staff were also given to her.

TELEGRAPHIC MEMORABILIA.

ABYSSINIA.—Reuter's agency states that it is understood that the Government has advertised for tenders for the erection of a large international radio-telegraph station at Addis Ababa.

ARGENTINA.—Reuter's Trade Service at Buenos Aires informs us that the International Telephone & Telegraph Corporation has made formal application to the Minister of Posts and Telegraphs for permission to establish a wireless-telephone service between Buenos Aires and New York.

AUSTRALIA.—It is reported, says *The Electrical Review*, that the British General Electric Co., Ltd., has secured a contract for the telegraphic transmission of pictures between Melbourne and Sydney, the first experiment of its kind in Australia.

The same reliable authority also states that an agreement has been reached by the Commonwealth Government and the Western Australian Farmers' Broadcasting Co. for the continuation of the " A " class station in Perth, 6WF, under Government ownership. It was known that the company was anxious to sell its interest in the enterprise, which had proved a very unprofitable venture, but the terms under which the Government had agreed to take it over have not been disclosed. The Postmaster-General (Mr. W. G. Gibson) said negotiations for taking over " A " class stations in the other States were being undertaken on behalf of the Government by the Broadcasting Advisory Committee.

AUSTRIA.—According to *World-Radio*, at the end of 1928 the total number of receiving licences in force was 325,200. There were 17,283 cessations, but by Jan. 14, 1929, the total was 317,382.

BELGIUM.—It is announced from Brussels that the company known as Les Fils Isolés Belges, of Brussels, has entered into arrangements with native producers of cables and insulated wires for the sole sale of a part of their production. The firms concerned are the S.A. des Ateliers de Constructions Electriques de Charleroi, the Société Belge pour la Fabrication des Cables et Fils Electriques, of Brussels, the S.A. Manufacture de Cables Electriques et de Caoutchouc, of Eupen, the S.A. Cabléries de Seneffe, of Seneffe, and the S.A. Cabléries et Corderies de Hainaut, of Dour.

From the same capital city, but through Reuter's agency, it is also announced that a new wireless station is to be opened in the Belgian Congo. Arrangements are under way to set up a station for broadcasting talks and musical programmes. The Belgian Colonial Minister has given his assent to the scheme, and it is now being submitted to the Governor-General of the Congo for his consideration. The initiator of the scheme is Mr. Goebel.

BRITISH EAST AFRICA.—The *Electrician* draws attention to the following facts regarding broadcasting in British East Africa and the possible trade opportunities in this special direction, thus : " The Office of H.M. Trade Commissioner in East Africa reports that the programmes of the British East African Broadcasting Co., Ltd., comprise transmissions on 33.5 metres (1 kw.), with a range of approximately 1,000 miles, and also on 400 metres (4 kw.), with a range of approximately 60 miles. Broadcasting will take place each evening simultaneously. It is estimated that at least 2,000 sets will be sold within the next twelve months in the area served by the station. The most popular set will probably be the three-valve short-wave set with a loudspeaker, designed to pick up British, American and Dutch broadcasting services in addition to the local station, and adapted also to receive the 400-metres station. A smaller set of two valves with headphones will probably be demanded as a cheaper alternative, and crystal sets for use with the 400-metre station may also be in demand. British firms interested may obtain the names of likely importers of wireless apparatus on application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1."

CANADA.—From a report of the High Commissioner for Canada in London we learn that more than a quarter of a million Canadians using receiving sets had paid the Government tax of one dollar up to the end of November, 1928, an increase of 17,000 compared with the end of November, 1927. According to the *Board of Trade Journal*, the returns indicate that there are 226,240 private receiving licences, although it is believed that more than 100,000 sets exist on which no licence has been issued. The revenue from the issue of licences is devoted by the Department of Marine and Fisheries to the improvement of radio services, about a score of radio interference investigation cars being in use.

CHILI.—A company has recently been formed in Santiago, with a capital of £75,000, to introduce wireless picture telegraphy into Chile.

CHINA.—By the time these lines are printed the commercial wireless service between New York and Shanghai, via the Philippine Islands, will have been inaugurated by the Radio Corporation of America, says a reliable informant.

DUTCH EAST INDIES.—The commercial agent at Batavia (Mr. H. A. N. Bluett) has informed H.M. Department of Overseas Trade of a report that the Nederlandsch-Indische Radio-Omroep Mattschappij (Netherlands Indian Broadcasting Co.) will shortly be formed. The company will be established in Holland, and will be represented locally by two delegates. The capital required is f. 600,000, of which f. 300,000 has been promised by Messrs. Maintz & Co., Radio-Holland, and the Philips group in equal shares. The broadcasting station will be built in the neighbourhood of Batavia ; it is estimated that it will cost f.400,000.

According to Reuter's agent in Amsterdam, the wireless-telegraph traffic between Holland and the Dutch East Indies (direct and via America) yielded during the fourth quarter of 1928, so far as the Dutch portion of the revenue is concerned, roughly 462,800 florins, compared with 328,000 florins during the corresponding period of the previous year; figures for the whole year 1928 were 1,663,950 florins, compared with 1,107,000 florins in 1927, being an increase of over half-a-million florins, or just over £40,000.

FRANCE.—With reference to the suspension of broadcasting from the Eiffel Tower after 9 p.m. in order to avoid interference with Daventry (5XX), a statement has been made by the French Under-Secretary of Posts and Telegraphs. This statement is to the effect that the Eiffel Tower changed its wavelength from 2,650 metres to 1,484 metres, and the Under-Secretariat admits in the communiqué issued that numerous protests have been received since the beginning of the year. The change was, however, inevitable, since the big liners are now utilising waves exceeding 2,000 metres. It was for this reason that the Washington Conference of 1927 provided that the major European wavelengths should be confined to a band between 1,340 and 1,875 metres. The Administration also points out that the new length has given satisfaction in Southern Algeria, the Levant and Alsace. The forthcoming European conference in Prague may find a satisfactory solution.

The well-known firm of Messrs. Schneider & Co., of Le Creusot, France, have recently secured the French rights in the new system of signalling developed by the Submarine Signal Corporation, of New York, says *The Electrical Review*. It is stated that the system enables acoustic signals to be transmitted and received from below the surface of the sea, also enabling the direction and distance of the source of the signals to be determined.

GERMANY.—The number of subscribers increased during the final quarter of 1928 by 301,314, bringing the total to 2,635,567 on Jan. 1, 1929. The increase during 1928 was 625,725. Bavaria, in spite of its four transmitters, perhaps owing to the scattered peasant population, has not been able to boast of any great number of listeners, having only about six million inhabitants. According to *World-Radio*, they total now exactly 174,102, against slightly over 151,000 on Oct. 1. Every listener canvassing a new listener and giving his name and address to a Bavarian radio paper obtains a premium of 2 marks, the cost of a month's licence in Germany (24*s*. a year). The simultaneous transmitter at Berlin-East, which uses the same wavelength as Stettin and Magdeburg, has begun experimental transmissions.

International Consultative Committee.—Meetings of the International Consulting Committees of Telegraph and of Long-distance Telephone Communication are to be held in Berlin from June 10 to 17 next.

GREAT BRITAIN.—The British Post Office statistics show that last year damage to telegraph and telephone lines by gales during the year cost the Department £400,000, which figure was above the average, owing to the exceptionally severe weather. During the last four years £44,000,000 has been spent on capital account for the development of the telephone service with the result that five-sixths of the telephone wires of the country are now laid underground.

The British Post Office commercial accounts for the year ended Mar. 31, 1928, show that the cash receipts from wireless licences amounted to £1,234,898, from which was deducted £154,362 for expenses of management and £1,427 contributed towards the cost of converting certain spark marine telegraph stations. From the sum of £1,079,109 which remained, £824,237 was paid to the British Broadcasting Corporation and the balance to the Exchequer. The expenditure incurred in respect of the change of coast stations to the interrupted-continuous-wave system was the first instalment of a total expenditure estimated at £20,000, necessitated by an agreement reached at the Washington International Radio-Telegraph Convention in 1927.

The Association of British Chambers of Commerce recently addressed an inquiry to the Postmaster-General relative to the action which had been taken by the Post Office upon the recommendations contained in the report of Sir Hardman Lever's Committee on the inland telegraph service. In his reply, the Postmaster-General states, according to the *Daily Telegraph*, that five recommendations are still under consideration. Arrangements have been made which will facilitate more frequent adjustments of staff to traffic in the larger telegraph offices. The telegraph supervising force in London and the larger provincial post offices has been reduced in the last two years by about 160 posts. The replacement of Morse by teleprinter apparatus is being carried out as rapidly as possible, regard being had to the rate at which teleprinter apparatus can be manufactured and telegraph operators can be trained to work it. The question of concentration of traffic is being pursued, and circuits unnecessary for traffic purposes are being suspended.

Hull.—The B.B.C. announces that the Hull station has been included among those stations transmitting on the national common wavelength of 288.5 metres (1,040 kilohertz), which is ultimately to be adopted by practically all British relay stations; the change took place on Feb. 1. As the Hull station formally transmitted on a frequency of 1,020 kilohertz (294.1 metres), the change is so slight that very little, if any, readjustment of receiving apparatus should be necessary, as doubtless our reader-listeners have already discovered.

Kinnaird Head.—The automatic wireless beacon at Kinnaird Head, Fraserburgh, which has a range of a hundred miles, has been completed, and the first tests have been successfully carried out by representatives of the Marconi Company. The station may be identified by the call signal MMK, and it operates on a 1,000-metres wavelength. All the machinery is duplicated, and power is obtained from two 5-h.p. kerosene engines and storage batteries.

The General Post Office, as is generally known in radio circles, is gradually replacing the spark wireless telegraphy sets at its coastal stations with interrupted-continuous-wave instruments, which have already been installed at Seaforth (near Liverpool), Niton (Isle of Wight), North Foreland and Mablethorpe. This year the change will be made at Cullercoats, Northumberland, Fishguard and Wick.

London.—Wireless Pictures.—Some Interesting Examples.—On the 16th of last month the prospectus of a company was issued in London. New York financial interests were anxious to participate, but it was necessary for the prospectus also to be advertised in New York. The only way the prospectus could be got through in time for the next day's newspapers in America was by means of one of the wireless-photographic processes, in this case that of the Marconi Company. Within four hours the prospectus in photographic form was in the hands of the New York addressee.

Only a few days previously the New York correspondent of the *Daily Telegraph* had cabled the following:—

"By means of a blue print diagram sent by wireless telegraphy to New York from London, a new rudder is being constructed here for the disabled British steamer *Silver Maple*.

"The vessel is now being towed to Bermuda, and the new rudder will be shipped to her this week. To have sent the diagram by mail would have entailed a delay of eight days."

The *Daily News*, which itself utilises picture-telegraphy periodically, states that the "Fultograph system is at the moment undergoing tests by the British Air Ministry." The same authority adds:—

"The Meteorological Office hope to be able to adapt it for sending complete weather charts by wireless."

As these lines go to press the decision of the Air Ministry is still awaited. Meanwhile it is understood that "the apparatus has also been placed at the disposal of the War Office for tests."

The wireless correspondent of the *Daily Telegraph* also gives the following forecast of what looks like another "merger." He writes:—

"I understand on good authority that Wireless Pictures, Ltd. (the Fultograph system) and the Baird Television Co. may shortly join forces. Conversations have recently taken place between representatives of the respective boards of directors with a view to a merger. It is hoped that under this new arrangement the B.B.C. will continue to transmit Fultograph still pictures, in accordance with the contract signed with Wireless Pictures (1928) Ltd., last year.

"It is possible that another test of the Baird system will be made shortly. It will not be so much a technical test as one to obtain views as to the present value of television with regard to occasional television transmissions in the near future from B.B.C. stations."

HOLLAND.—The Radio Council, says *The Electrical Review*, recently formed by the Dutch Government for the purpose of exercising general control over all wireless telegraphy and telephony in the country has held its first meeting. The Minister of Waterstaat, under whose department the Council will work, pointed out that as yet broadcasting in Holland was not in a satisfactory state, and many difficult problems would have to be solved by the Council.

ISLE OF MAN.—Sir William Mitchell-Thomson (Postmaster-General) has stated that if no unforeseen difficulties arose the work of laying the submarine telephone cable between the Isle of Man and the mainland would be completed in July next.

JAMAICA.—Reuter's Kingston Agency reports that Mr. Russell F. Pike, of the Radio Corporation of America, intends to form a wireless broadcasting corporation to be controlled and operated by Jamaica and also that the capital shall be raised on the island. He has received assurances of support from 12,000 Jamaicans of good standing.

JUGO-SLAVIA.—The 28 rooms in the building of the Academy of Sciences (Nauka) at Belgrade which are to house the new broadcasting company are nearly ready for occupation, and the Marconi apparatus from England is already being placed in position. Dr. Braun, formerly in the service of Ravag, is a director of the new company, and its general manager; tests will begin on Feb. 1 with 6 kw. energy, and the two aerial masts, 80 ft. high, are already erected on the roof of the premises. Hitherto South Slavia has been very ill-provided with broadcasting stations, that at Zagreb is only of 0.7 kw., but, according to *World-Radio*, Ljubljana (Laibach) is nearly ready now, with its Telefunken plant of 2.5 kw. and masts 400 ft. high.

Vienna reports that the Belgrade Government intends to lease all the telephone and telegraph services to private companies.

LUXEMBURG.—The Grand Duchy now possesses a broadcasting station, Radio-Luxemburg, which can, it is reported, be heard throughout the whole State. At present the sole resources of the station are derived from the subscriptions of members of the Association of Friends of the T.S.F. for the development of broadcasting in the Duchy, says *World-Radio*; owing to the limited income, it is not possible to give daily transmissions.

NEW ZEALAND.—Through Reuter's Wellington Agency we are informed that the number of wireless listeners' licences issued in New Zealand last year was 42,801, which is an increase of 4,616 over the figure for the previous year.

ROUMANIA.—The ban that has existed since 1925 on the use of transmitting and receiving stations within a zone of 30 km. of the frontier has been removed. According to the *Wireless World*, after a long period of hesitation, Rumania has finally decided to adopt broadcasting, and it is hoped that a 12-kw. station under construction at Otopeni, between Bucharest and Ploesci, will be working before the end of the present month. A provisional 400-watt transmitter is already in operation on 401.6 metres. According to the *Plan de Bruxelles*, the station should be working on 223.9 metres.

The following item from the columns of the *Electrician* may not be unconnected with the above information: "According to a Customs Circular dated Dec. 14, 1928, wireless apparatus and accessories may be imported into Roumania without any permit from the Roumanian Postal Authorities."

The *Board of Trade Journal* states that the First International Exhibition of Radio Apparatus in Roumania takes place in Bucharest from April 15 to June 1 this year. Apparatus for exhibition admitted free of duty. The *Journal* suggests British firms could exhibit with advantage. For further information apply Le Comité d' Organisation, Exposition Internationale de Radio, 171, Strada Romana, Bucharest III.

RUSSIA.—The number of individual listening licences in the Soviet Union now exceeds 304,000, says *World-Radio*, of which roughly 264,000 represent dwellers in towns, the remaining 40,000 being villagers; the number of crystal-set users is 255,000, and the balance (49,000) have valve sets, and, of the latter, 13,000 have loud-speakers. Thus, 87% of the receiving sets are in towns and 13% in the country; 10,000 crystal sets and 300 loud-speaker sets are being used in "houses of detention" (the Soviet substitute for prisons). A Russian expedition has established a radio transmitting and receiving station on the Caucasian mountain Kazbek. Experiments are being carried out at various altitudes up to 5,300 metres. The leader of the expedition is the director of the most northerly station, Tiflis. The Chief Hydrographical Department of the U.S.S.R. has decided to establish a radio station on Cape Jelanyi, 77 degrees of northern latitude, to observe the movement of ice fields and also carry out scientific meteorological observations. It will be the most remote northern station in the world, and, together with those on Matochkin Shar and Yougorsky Shar, will serve the Polar seas.

SIAM.—The Prince of Kambaeng Bejra, Minister of Commerce and Communications, explains that the law banning wireless apparatus is designed to protect the pocket of the Siamese citizen. Experiments are under way which are designed to test broadcasting conditions in Siam to find out what type of apparatus is most suited to the climate, the *Evening News* announces. As soon as they are completed, says the Minister, announcement will be made of the type of broadcasting contemplated for Siam and the type of wireless sets most suitable to receive it. Then the ban will be lifted.

SOUTH AFRICA.—The South African Wireless Telegraph Co. decided, on Jan. 8, to order equipment for a radio-telephone service with England, which is expected to be in operation within nine months.

SWEDEN.—Reuter's Trade Agency in Stockholm informs us that the number of receiving licences is steadily growing, the increase during the last three months of 1928 having been nearly 10,000, so that the total rose to 381,000, or 62.6 per thousand inhabitants.

SWITZERLAND.—The Canadian Broadcasting Commission (see also under CANADA) visited Geneva on Feb. 8 and had discussions with members of the Communication and Transit Section of the League of Nations and with the Secretary-General of the Union Internationale de Radiophonie.

There is no truth in a report that cable communication is being established between Geneva (Switzerland) and Kootwijk (Holland) for the world broadcasting of League conferences at Geneva. According to *The Times*, the report probably arose out of the fact that the League Secretariat proposes to begin, at the end of February or the beginning of March, new technical experiments (on the lines of those of last summer) in the broadcasting of speeches from Geneva to distant points by a short-wave transmitter. The Netherlands Government is again placing its Kootwijk station at the disposal of the Secretariat for one experiment a week.

TRISTAN DA CUNHA.—The Rev. A. G. Partridge sailed last month to take up his voluntary duties as Chaplain. He has with him a standard Marconiphone three-valve short-wave set, which has been presented to the island by friends. As there are no facilities for charging batteries, the high-voltage anode energy will be provided by a bank of 90 large Leclanché cells, and the valve filaments will be heated by special Sterling "Invicta" cells. It is calculated that they should last twelve months, and as it is hoped that arrangements will be completed for a special schooner from Cape Town to call at least once a year, there should be no interruption of reception. Thus this tiny group of humanity will be brought into daily contact with three continents: Europe, through 5SW (Chelmsford, England) and PCJJ (Holland); America, through 2XAD, 2XAF, and other short-wave transmitters; and Australia, through 2FC (Sydney), and perhaps 3LO (Melbourne). It is also possible that the Cape Town (South Africa) station may be heard, adds *The Electrical Review*.

U.S.A.—The last-mentioned journal also publishes the interesting information that the American Institute of Electrical Engineers, through its Edison Medal Committee, has awarded the Edison medal to Dr. Frank B. Jewett for his contributions to the art of electrical communication. Dr. Jewett is vice-president of the American Telephone & Telegraph Co. and president of the Bell Telephone Laboratories. In 1904 Dr. Jewett joined the staff of the American Telephone & Telegraph Co. and began his engineering research work in telephony. Under the direction of Mr. John J. Carty, then chief engineer, Dr. Jewett worked out methods which led to phantom loading of large-gauge and open-wire circuits, the practical use of telephone amplifiers and the development of phantom duplex cables. In 1912 he became assistant chief engineer of the Western Electric Co., and in 1916 chief engineer. During the war he served in the U.S. Signal Corps, and in 1925 was appointed to his present position.

British Relay.—Music broadcast by the B.B.C. was heard on Feb. 1 by American listeners from New York to San Francisco. The programme was carried on a wavelength of 25.53 metres by the National Broadcasting Company, being picked up from Chelmsford at Riverhead, Long Island. The experiment was not altogether successful owing to severe atmospherics.

British programmes will also be heard all over the United States in March by transmitting them by short waves across the ocean. The British Broadcasting Corporation's programmes are to be received at New York, says *The Times*, by the Radio Corporation of America at Riverhead, Long Island, the Corporation arranging for further broadcast from the Atlantic to the Pacific. Arrangements are also being made for European listeners to hear American programmes.

At its meeting on Dec. 22, the Radio Board decided to rescind, on Jan. 1, 1929, the licences of two television stations, namely, WGY Schenecaty, and WIBO Des Plaines, Ill., and indicated that a special broadcast band would be set aside for television experiments, says *World-Radio*. This action, it appears, followed reports that television transmissions were causing interference with the regular broadcasting channels.

American Radio Dispute.—With regard to the dispute mentioned in our last issue (p. 85, col. 2), it has since been reported that a suit against the "Radio Trust" licences was to be heard in the United States Court at Wilmington Del, on Feb. 11. The *Financial News*, however, points out that the "Trust" has lost its case twice, and that the present suit is to make the injunction permanent. It will be recalled that the G.E.C., the A.T. & T., the Western Electric and others were defendants.

GENERAL AND PERSONAL.—*Parliamentary Queries and Replies.*—On Jan. 29 Mr. Malone asked if the Ministry of Transport was aware of the progress made in Germany in the development of communication between railway trains and the telephone service; and whether any experiments were being conducted in this country.

Sir W. Mitchell-Thomson, who replied, said he had asked for and received reports from time to time from the German authorities concerning an experimental service which was in operation on certain trains running between Berlin and Hamburg for the provision of telephonic communication between passengers in trains and telephone subscribers. Similar experiments conducted in this country had demonstrated the practicability of establishing telephonic communication with moving trains, but at present the demand for such communication did not seem likely to be sufficient to justify the expense involved to the railways in the provision of facilities.

Mr. Malone asked the Postmaster-General whether his department had at any time suggested to the British Broadcasting Corporation that facilities for experimental transmissions should be afforded to the Baird television system, such as had been arranged with the "Fultograph" apparatus.

Sir W. Mitchell-Thomson said he had informed both the British Broadcasting Corporation and the Baird Television Development Company a few months ago that, so far as his Department was concerned, he would be prepared to agree to the use, subject to suitable conditions, of one of the Corporation's stations for experiments with television apparatus. The Corporation decided, after its officers had witnessed a demonstration of the Baird system, that it did not then fulfil the conditions which would justify a trial through one of its stations, although it expressed its readiness to review this decision if and when development justified it. A further demonstration was being arranged, after which the question of using a broadcasting station for television would be reconsidered.

On Feb. 5 Mr. Thurtle asked the President of the Board of Trade if he was aware that the Baird Television Development Co., Ltd., had not held any annual meeting or submitted any accounts and balance sheet since the company was floated in 1927, a period of more than 18 months; and if he was proposing to take any action to enforce the law against that company.

Sir Philip Cunliffe-Lister said he understood from the Chairman of the Company that the meeting was deferred in view of negotiations with the General Post Office and British Broadcasting Corporation, which were in progress in the latter part of the year for the provision of facilities for an experimental broadcast of television; that arrangements had only just reached a stage at which progress could be reported to the shareholders; and that a general meeting was now being convened. In the circumstances, he did not think that any action on his part was required.

Lord Apsley asked the Postmaster-General how many miles of telephone and telegraph lines were relaid underground in 1928 and at

what cost; and whether he was making any arrangements with electricity supply companies with a view to securing their co-operation where new electric cables were being laid in the same district.

Sir W. Mitchell-Thomson said that ducts and cables containing approximately 600,000 miles of wire, were laid underground during 1928 at a cost of £4,280,000. About 40,000 miles of this represented diversion of overhead wire. Arrangements had been in operation for some time past for the exchange of information between the Post Office and other undertakers, including electricity supply companies, with regard to projected underground works, and every endeavour was made to secure co-ordination in this respect; but it was undesirable to lay telephone or telegraph lines in very close contiguity to power circuits.

On Feb. 7 Colonel Howard-Bury asked the Chancellor of the Exchequer whether, seeing that the receipts of wireless licences amounted to £1,250,000, of which £824,000 was paid to the British Broadcasting Corporation and £254,000 to the Exchequer, he could see his way to reduce the wireless licence fee from 10*s.* to 7*s.* 6*d.*

Sir W. Mitchell-Thomson, who replied, said he could not. He shared the view expressed by the Crawford Committee that a fee of 10*s.*, which was equivalent to 1*d.* for three days' programmes, was not unreasonable, and he did not propose to recommend a reduction.

Also, in reply to a question in the House of Commons, Lord Wolmer, Assistant Postmaster-General, stated on Jan. 24 that the number of wireless receiving licences in force on Dec. 31, 1926, was 2,178,430; on Dec. 31, 1927, it was 2,395,106; and on Dec. 31, 1928, approximately 2,628,000.

Private Companies.—Amalgamated Wireless (Australasia), Ltd.—Dividend of 6% for year ended June 30, 1928 (first since 1922), is announced. Pending result of wireless cable negotiations, board thinks it desirable to postpone the ordinary general meeting.

Western Union Telegraph Co.—The earnings report for the past year, with the December figures estimated, shows a gross revenue of $139,244,596, against $134,460,816 in 1927. The available balance is given as $18,983,074 (against $18,614,784), and after deducting interest on bonded debt there is a net income of $15,373,669, as compared with $15,030,453.

For Our Advertisers.—A Danzig firm desires to be placed in touch with British firms able to supply 170 tons of copper wire and 4½ tons of bronze wire. My information is undated, but the reference number for further details from the Department of Overseas Trade is A.X. 7,374.

New Zealand Post and Telegraph Department. Mar. 26—Switchboard cords (reference B.X. 5,067).

South African Posts and Telegraphs. Mar. 28—Supply of telephone switchboard cords (tender No. 148) (reference B.X. 5,048).

Postmaster-General's Department, Melbourne. April 2—Supply of jumper rings and terminal strips (schedule C. 405) (reference B.X. 5,066).

All references are for D.O.T. See also under "British East Africa" above.

Obituaries.—The death of Mr. Stephen Paget Luke took place on Jan. 1, in his 84th year. He was appointed to the Indian Telegraph Department in 1868. In 1890 he was appointed Director of the Construction Branch of the Telegraph Service. In 1895 he was promoted to be Deputy Director-General of Telegraphs, represented India at the International Telegraph Conference at Budapest in 1896 and retired in 1897. Mr. Luke was a director of the Telegraph Construction & Maintenance Co., Ltd., and was for some years chairman of the Calcutta Electric Supply Association

The death took place on Feb. 2, at his residence, at Weston-super-Mare, of Mr. Thomas C. Stephens, superintendent at Weston for the Commercial Cable Co. He succeeded Mr. J. P. Gorton in this position in December, 1927, and he had been with the company for 40 years.

Mr. J. H. Jones, late manager of the cable depot of the Eastern Extension Telegraph Co. at Singapore, left £12,263 gross and £12,031 net personalty.

To this list of veterans of the Telegraph Service who have honourably served the craft in their respective spheres one must add yet another equally honourable; maybe less widely known; certainly not less beloved. Henry John Smith (Daddy Smith) passed over on Jan. 27, due to an attack of influenza, in his 88th year. His daughter, Miss F. Smith, is at the present time a supervisor in the C.T.O., where her father spent so many of his service years. He entered the Electric Telegraph Co. in 1861. After the transfer, in 1870, he was attached to the night staff as a Clerk in Charge, together with the late Mr. Alfred Eames, Stanley J. C. Ferguson and others, including Mr. Harry Brookman, still living in his 90th year.

Mr. Smith's sobriquet, of "Daddy," was earned in his early days, always wearing a long flowing beard, and later to the fact that he was most gentle in all his dealings with his subordinates. He had reached the Higher Grade of Superintendent in 1901, when he retired after 40 years' service.

Congratulations to the following: Miss Stokes, upon her retirement from the C.T.O. upon reaching the pensionable limit of those who, despite the stress and strain of these latter supervising years, have reached the desired goal, and that, with health not too sadly impaired to preclude a long and happy leisure.

Miss Stokes entered the Service as a Telegraphist in 1884, promoted Asst. Supervisor, 2nd Class, 1904, 1st Class 1914, Supervisor 1919 and later Supervisor, Higher Grade, and leaves behind her a host of friends and well-wishers in all ranks.

To Miss H. M. Rimington, who takes her place, none will begrudge this official seal on her competency.

To the following group of C.T.O. Overseers and Superintendents, especially in these lean years, congratulations also, wishing the group were much larger: Mr. T. W. Jones to Asst. Supt. (Lower Grade), Messrs. C. Custance, E. Hopkins, A. E. Wheeler, F. Norton, Sen., E. W. Hewer, W. K. Ware and R. P. Mitchell, to Asst. Superintendent's class.

Greetings from Mr. A. Statham, now in charge of Karachi Civil Radio Station, and who wishes to thank the staff of the C.R.O. for their help and courtesies when visiting that section in 1926. Also from Mr. E. Bradley, travelling in Algeria!

It was a thousand pities that the inclement weather and other circumstances reduced the audience who were able to put in an appearance at the I.E.E. on the 18th ult. to so small a number when A. J. Waldegrave, Esq., M.B.E. (Deputy Comptroller and A.G.D.), gave a most illuminating address on "Commission Control of Public Utility Services."

Anyway, those who listened to what one of the speakers afterwards declared to be "one of the most *listenable* addresses," were well repaid for *any* inconvenience suffered by putting in an appearance. Doubtless the paper will be published, but nothing will give back again to those who were fortunate enough to be among the privileged few to *hear* the actual delivery; its freedom from all monotony of tone, its touches of dry humour, which, without rancour, drove home a point, its simplicity of language, and the evident sincere desire of the author to give a well-balanced view of matters which are coming more and more to the fore in the next decade or two.

THE THINKING MAN.—"The man who cannot think is not an educated man, no matter how many college degrees he has acquired."—*Henry Ford.*

J. J. T.

C.T.O. PENSIONERS' NEW YEAR REUNION.

THE 9th New Year gathering of pensioned colleagues of the C.T.O. took place at the Express Dairy Private Rooms, Bloomsbury, on the 9th ult.

There was, as usual, a good attendance, though naturally, with the flux of time, several familiar faces were missing, some through more or less temporary causes, while one or two had joined the Great Majority since last we congregated.

Of these, Mr. W. T. Picking (Little Tommy Picking), who, entering T.S. in 1873, quitted it 3 years later to be an old R.E. man, and served in Cyprus and during the Boer War in 1899, retiring from the Telegraphs in 1920, passed away at the close of last year, followed only by a few days by the much-beloved Miss M. A. Watts. Miss Watts joined the old "Electric" Company in 1864, and fell asleep in her 86th year. She had a wonderful personality and was one of those rare folks who seem to bring an atmosphere of goodwill, brightness and love of all that is beautiful with them. To the end she was able to take long journeys alone. To the last she declared in word and deed, "Life is a Beautiful Thing."

Still, in the last month of the year there also came the news of the death and burial at sea of that Controller friend of the C.T.O., Mr. John Lee, whose energetic spirit was far too strong for mortal flesh to hold any longer.

One minute's silence, all standing, was requested by the Chairman, Mr. J. Bailey, and reverently observed in memory of the dear dead.

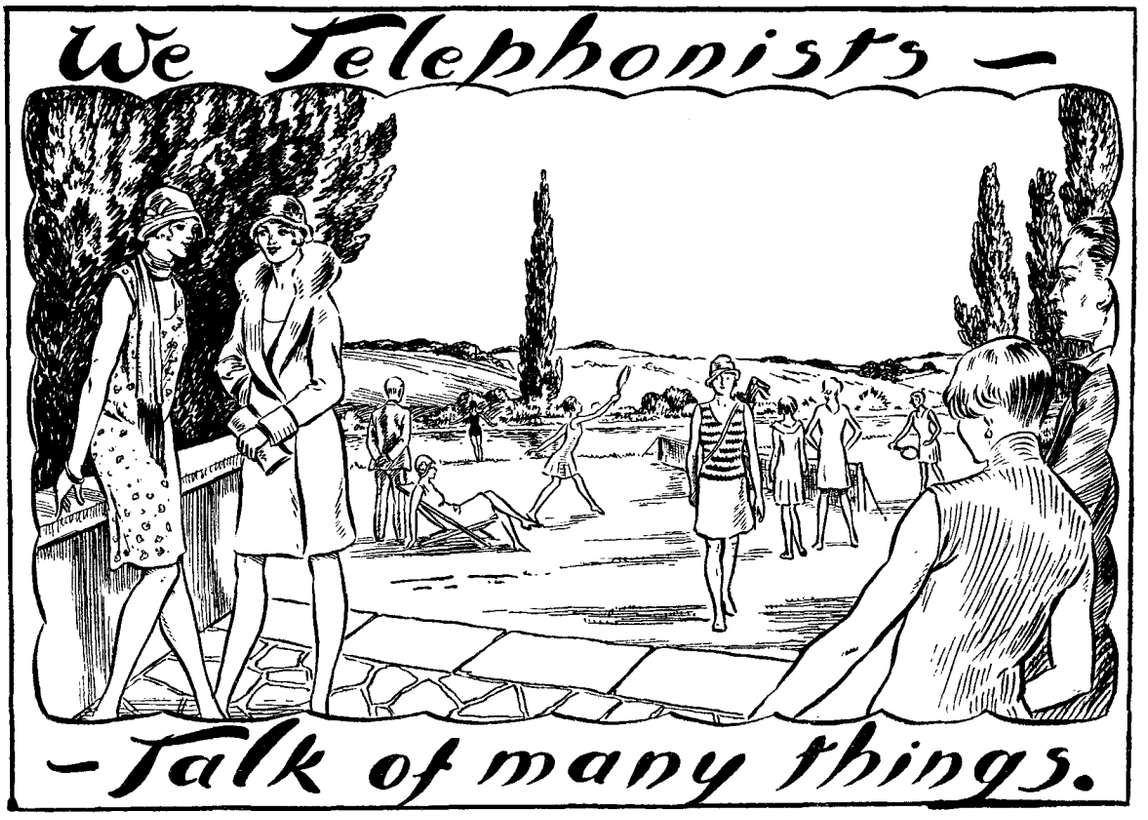
Present: Messrs. W. W. Abery, G. Adams, H. E. Adams, B. G. Askew, J. Bailey, I.S.O., J. Bearman, T. G. Beavis, A. E. Beckett, H. E. P. Bell, C. Bent, G. T. Bennett, E. Bird, C. J. Boulton, H. J. Broughton, F. W. Butler, W. J. Callow, T. W. Charter, E. J. Clarke, F. Clark, J. H. Crook, J. Downing, A. W. Edwards, O.B.E., C. Elphic, H. Evans, H. W. Evans, C. J. Faunch, F. J. I. Fischer, W. S. Fisher, F. W. Fryatt, P. Garrood, W. E. Gibbins, J. G. Goldsack, J. Gough, E. C. Govier, G. Gray, T. W. Gunter, W. Haggerty, F. W. Harrison, C. H. Heywood, F. Hicks, G. H. Hickman, H. E. Higgins, E. L. Hilton, W. F. G. Hodes, G. Janes, D. W. Jones, J. J. Jones, W. E. Jones, A. W. Judd, C. S. Keen, R. E. Kemp, G. F. A. Lange, C. R. Lowe, A. W. F. Ludlow, R. C. Luttrell, A. W. Malein, J. A. May, C. J. Minors, A. Morgan, F. J. Muller, G. W. Murdoch, H. Oakman, S. Pearce, H. Pond, E. F. Poole, J. E. Sayers, H. W. Senhenn, S. T. Shapcott, J. W. Sherrington, S. J. Smith, E. J. Stone, J. J. Sympson, G. E. Taylor, W. J. Town, S. Trott, C. J. Turner, W. Turner, J. J. Tyrrell, A. E. Ward and H. B. Winder.

In any case, one cannot but note the presence of some of the notables, Jim Bailey, bland and smiling, W. S. Fisher, the doyen of the party and now in his 82nd year, Alf Morgan and Ben Askew, who are running neck-and-neck for their diamond jubilee wedding celebration, Teddy Hilton and "John Bennett" of old P.T.C.A. fame, Alf Edwards, alert and genial with a full programme of activities new and old, Master Judd, the last of the old "I.D.," and Jimmy Tyrrell with his old mentor, Harry Broughton.

The presence of that trenchant, incisive speaker and writer, Adam Jordan, was sadly missed, though the news of his condition was somewhat reassuring one is glad to note.

It was unanimously agreed that appropriate letters should be sent on behalf of the gathering to the bereaved and to those who were laid aside.

C. S. K.



INTELLIGENT anticipation! Watch this space next month for an article by Percy Flage on "Influenza."

London Wall Exchange.

The London Wall Refreshment Club gave a Christmas Dinner and Dance to 340 members and friends at Lyons' Corner House, Coventry Street, on Jan. 3, 1929.

Mr. Grove, who was accompanied by Mrs. Grove, acted as M.C., and the guests included Miss Cox, Miss Beaumont, Mr. and Mrs. Beck and Miss Ralph.

The committee is to be congratulated on the well-organised arrangements which made the evening so enjoyable to all present.

A concert was held on Jan. 9, 1929, at the Cripplegate Institute, to inaugurate a Dramatic and Orchestral Society. It was well attended, and the performers gave evidence that talent is plentiful at London Wall.

Misses C. Hunt and E. Shaw showed themselves possessed of fine voices, and recitations by the Misses E. Cooper and V. Antrobus were much appreciated.

The sketches—"The Society for Worn-out Wives" and a "Holiday in Switzerland"—did credit to all who took part, and the concerted items by the "Chorus" were well done.

Miss J. Moore spoke during the interval on the aims of the proposed Society; and the producer of the sketches was presented with a bouquet of carnations by the "Company."

Miss Johnston especially thanked the artists for their splendid efforts when the concert was over, and the evening was so successful that an election of officers for the new Society will take place at an early date.

G. M. T.

Bermondsey Children's Tea.

On Jan. 5 the Bermondsey Exchange and Engineering Staffs provided a tea and entertainment for a party of 100 children drawn from two of the day schools in the poorest part of Bermondsey. The entertainment took the form of a performance of "Aladdin" by members of the Exchange Staff and was much appreciated. The tea followed, when the children did full justice to the ham sandwiches, cakes, &c., provided for them. Afterwards they played games until 7.30 p.m., when each child was given a doll or toy and a bag containing cakes, sweets, apple, orange and bon-bon. Altogether the time passed very happily for all concerned.

K. E. W.

Mountview Exchange.

Among the notable people who visited Hornsey last week-end was our old friend Father Christmas, who paid a belated visit, but none the less welcome one, to the local schoolchildren at a party given at Campbourne Road School by the staff of the Mountview Telephone Exchange.

In spite of the chilly weather the little children arrived very early, some very much before the appointed hour, and all very anxious to be admitted.

More than one hundred children sat down to tea, and all ate with great relish the dainties provided for them—the arrival of Father Christmas brought forth a great cheer from the "kiddies." We hope that there still are some children who believe in the beautiful tradition of "Father Christmas."

Whilst the hall was being cleared for further activities, the children sang community songs with great gusto, and were entertained by recitations from two of the helpers, which met with such enthusiasm that only an encore would suffice.

Meanwhile the ball was kept rolling by the Bowes Jester Concert Party and a nigger minstrel who amused the children very much with their funny songs and stories.

And now—the great event of the evening had arrived. In one corner of the hall stood a large Christmas tree very tastefully decorated and lighted with many coloured fairy lights. Much thought had been spent in decorating the hall and tree, and the helpers were amply rewarded by the keen appreciation shown by the children.

Father Christmas presented each child with a toy and a packet of sweets from the tree, and they all appeared very happy and contented with their respective presents.

As all good things must come to an end, so did our little party. When the children were ready to go home they were given an apple, orange, banana and balloon.

Thus ends our second annual children's party, which we hope will only be one of many more.

D. A. P.

Willesden Section Social and Dance.

An enjoyable social evening was spent at St. Gabriel's Hall, Cricklewood, on Friday, Feb. 1, when all Exchanges in the Willesden section were represented, the total number present being approximately 150.

During intervals of dancing, songs were excellently sung by Miss Calkin of Finchley, Miss Pearson of Willesden, Miss Agar of Barnet, and Mr. Nobbs of Willesden. An exhibition of toe dancing was given by Miss Wotherspoon, of Willesden, and Miss Gustine of Finchley gave two interesting recitations.

Considerable amusement was added to the evening's entertainment by a play in one act, "Five Birds in a Cage," given by some of the Pinner telephonists, viz.: Misses Keeley, Worman, Daynes, Vainey and Blindell.

Mr. Marland, Service Superintendent for the section, who acted admirably as M.C., passed a vote of thanks to Miss Sewell (Chief Supervisor at Willesden) for the excellent organisation and the enjoyable evening.

We all hope that there will be a repetition.

C. M. B.

Joggin' On.

I suppose it is at this time of the year that one is apt to feel the ill-effects of the strain entailed during the preceding winter months. Colds are rampant, and a general chill seems to be in the air. We feel somewhat disheartened, and discouraged. The following little rhyme, which I remember reading in a book some time ago, is perhaps a good description of this mood :—

I keep on joggin' on,
The Lord knows where and back ;
Each day seems the same,
Leaves me on the blessed track.
Seems to me I never move,
Every day's like them that's gone—
Still—I'm trampin' all the time,
Joggin' on.

And yet, although we may not appear to be accomplishing anything very great, we are in fact "tramping all the time," "sticking it," "facing the odds," "doing the work that's nearest" (though it's dull awhile !), and too, maybe, we are helping a few lame dogs as we go along. I think it was Spurgeon who said "By little strokes, men fell big oaks," and it is by many small things well done that we may find we have sown better than we knew, and the reaping may surpass all our expectations.

Let us take heart. The fairest day has yet to be—the sweetest hour is yet to come !

L. R.

A (True) Leaf from a C.O.'s Diary.

Now my "paper-work" is o'er,
I think a spot of "door-to-door"
Is indicated ;
And by employing *all* my wiles,
Whilst standing on the pathway tiles
Most antiquated
Of this still more ancient and decrepit villa,
I *may* induce the owner to consider
How much better
Off he would be with a 'phone,
How it couldn't be too well known
That a letter
Takes much longer to arrive
Than the spoken word—in short you're not alive
Without a "tele" in the hive.

* * * *

Two solid and misspent hours !
No wonder that a C.O. sours
At thirty-five.
What a street ! What a life ! !
And I'll bet that speculation's rife
As to why I've
Been around, and what's the game ?
They're all cast in the mould the same.

* * * *

Still, one more try. That new building there,
'Tis of a goodly size, and fair
At least I'll sow
The seed of a future heavy order.
(Perhaps I'll then be able to afford a
Bigger row
Of carrots next year in my garden).
Well, here we are—I *beg* your pardon,
In this half-light
I quite over-looked you A cigarette ?
Yes, vile weather—er—I did not get
To rights
Your name ? Ah, the general foreman, Arthur.
Well, well, I suppose you've not much farther
To proceed
With this job—Five floors ? Begad !
Accept this—I'd be glad—
Oh yes, indeed.
Now could you furnish me with "pars."
Of the firm concerned—I'd say a garage,
Am I right ?
For then I can arrange . . .
What ! A TELEPHONE EXCHANGE ! !
GOOD NIGHT ! ! !

R. A. L.

Meek Boy's Vengeance.

The English master at a certain school thought he might well employ the last period of one of his junior forms before the holidays in the construction of couplets. He gave the boys the first line, and waited to see what they could do. To the line—

"If I had twopence to call my own . . ."

a very insignificant and meek 11-year-old added :

"I'd insult the Head o'er the telephone."

—Extract from Provincial paper.

A. J. C., Preston.

Contributions to this column should be addressed : THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch.

THE business done by the Contract Branch during the month of January resulted in a net gain of 5,984 stations, as compared with 5,590 last year.

We have referred more than once in this column to the good results obtained from enclosing postcards advertising extensions with the accounts of subscribers who do not rent extensions. Up to the present orders for 2,458 stations have been obtained from this source and we take it as a compliment that this method of advertising, which emanated from the branch, has now been extended to the Provinces. It is a pity, however, that, through being a Government Department, we have not got the liberty of an ordinary commercial undertaking in choosing and designing our advertising matter.

We are glad to know that the suggestions in the notes entitled "Help" in the *Journal* for September are beginning to interest the staff outside the Contract Branch. Indeed, "Self-help" might have been a more appropriate title, as it must be evident that the increased growth of the system means more opportunities for the staff of all grades and branches, and when this sinks in fully we ought to have a large number of "unofficial Contract Officers" anxious to see the system extend as rapidly as possible. By-the-bye, have you sent in the names of any possible subscribers yet ?

The following extract from a letter indicates the curious nature of some of the instructions our Contract Officers receive during an epidemic of influenza like the recent one :—

"I want a longer cord. I am ill in bed. My maid is also ill in bed.

"When your man comes he is to ring the bell, then go and stand on the steps, and I will throw the keys of the house to him."

We hear that one member of the branch whose waist measurement is decidedly above the average went into a multi-coin box call office the other day to ring up the office ; he put his twopence in the box in order to get the exchange and explain that he wanted a service call, and intended to press button "B" to get it back. Imagine his face when he realised that his "corporation" had pressed button "A" during his efforts to get near the mouthpiece and his twopence had gone ! !

Up to the time of writing these notes, orders for 365 exchange lines and 37 call offices have been taken for the British Industries Fair, which was opened at the White City on Feb. 18. Arrangements have been made for continental and transatlantic calls to be available from certain call offices as well as from the exchange lines. A demonstration set of the automatic system has also been placed near the Imperial Institute Exhibit.

The orders obtained last year covered 311 lines and 28 call offices.

There were 214 exhibitors at the recent Furniture Exhibition at Olympia and orders were obtained for 85 lines. Last year orders for only 77 lines were obtained from 215 exhibitors.

The day when newspaper placards in London read "London Temperature below Zero," the staff at one of the district offices were trying to forget the cold and the frozen pipes and cisterns they had at home when they received two agreements, one signed by Jack Frost & Co., Ltd., and the other from British Evercold, Ltd. ! ! !

Four persons living in two adjoining houses in Horn Lane, Acton, had narrow escapes from death through gas poisoning recently. One of them

WHERE TO STAY.

owes her life to a telephone call. She realised her bedroom was full of gas and tried to get out but collapsed on the landing. After a time she was aroused by the telephone bell, struggled to answer it, and heard her neighbour say "Open your windows; come down and get out of the house."

She managed to carry out these instructions and is now more than grateful to the Contract Officer who induced her to rent the telephone some time ago.

* * * *

National Sanatorium, Benenden.

The third of this winter's series of concerts provided by the staff of the L.T.S., and ably organised by Miss Margaret Worth, was held on Saturday, Jan. 26.

The artistes were Miss Norah Smith, soprano, Miss Hilda Knight, mezzo-soprano, Miss Winifred Shaw, elocutionist, Mr. H. A. Wharton, trumpeter, Mr. John Curr, violinist, Mr. Tommy Watler, humorist, Mr. Hugh Williams, tenor, and Mr. A. C. Vincent, accompanist.

Miss Knight and Mr. Curr made their first appearance at these concerts and the former, in operatic solos, and also duets with Mr. Williams, proved a worthy addition to the party, while the latter's violin solos were greatly appreciated.

The audience, as usual, was very enthusiastic, particularly in the community singing numbers led by Miss Worth and assisted by the rest of the party. At the conclusion anxious enquiries were made as to the date of the next concert, and an assurance was given that a further visit would be arranged on Mar. 2.

One patient expressed a hope that he would not be discharged before that date, eager as he was to get home once again. Before leaving, Dr. Menzies, on behalf of the Medical Officer in charge, who, unfortunately, was a victim of influenza, in thanking the concert party in general and Miss Worth in particular, stated that the staff and patients' debt of gratitude to the L.T.S. was increasing to an enormous extent. Such an obligation could never be redeemed, but appreciation and thankfulness were offered in an abundant measure. After the concert the Matron provided an excellent supper for the artistes, and before departure Mr. Hugh Williams, on behalf of the artistes, once again thanked the staff for their hospitality.

A suggestion has been made in more than one direction that a Sanatorium programme should be given in town so that those who have shown so keen an interest in these concerts should have an opportunity of enjoying a type of programme that is at present confined to patients at the "San." Such a function would not be difficult to arrange, and the proceeds could be devoted to provision of further entertainments for our colleagues, the patients, but what measure of support would it receive?

Will the local representatives of this journal who receive any further enquiries with regard to this proposal kindly forward them to Miss Worth, 96, Goodwood Road, S.E.14.

* * * *

The London Telephonists' Society.

On Saturday, Jan. 26, the Annual Dance of the London Telephonists' Society was held at the Bishopsgate Institute.

Many who came to the dance are old friends who come because their recollection of past pleasures gives them pleasant anticipations of those to come; but amongst those who attended were many who had never before been present, and we hope that they, too, have now joined the magic circle.

The weather was kind: a great advantage when one is going to a dance, consequently everyone arrived feeling in the best of spirits. Owing to the goodness of Mr. Thirkell, who acted as M.C., the whole evening passed smoothly into our memories.

The Fourth General Meeting of the Society was held on Friday, Feb. 1, at the City of London Y.M.C.A., Aldersgate Street, E.C.1.

Owing to the unavoidable absence of the President, Mr. Dive, the chair was taken by Miss James, who introduced Captain Reid, a lecturer we had heard with pleasure last session.

Capt. Reid explained that his subject dealt with the psychological side of the problem of physical and mental aptitude of certain persons for a given calling, and he gave us many examples of the experience he has gained when carrying out investigations on behalf of various commercial firms. He told us of research work with which he is connected, instituted as the result of efforts of the Director of Medical Research of the R.A.F., the outcome of which will have a great effect on psychological selection as opposed to personal selection in the recruitment of staff; and which, he states, will avoid the possibilities of misjudgment which the latter method presents.

The methods used were demonstrated on some apparatus brought by Captain Reid for the purpose, and although the type of tests demonstrated were for finding the suitability of certain persons as aircraft pilots, the underlying principles would be the same if applied to other occupations.

At the conclusion of his lecture the audience were invited closely to examine the apparatus, and much practical interest was exhibited.

There is no doubt that this lecture was most popular, and the thanks of all were warmly extended to Captain Reid for the pleasure he had given us.

Football.

After rather a bad spell the team has suddenly returned to its best form by recording two successive wins against the Land Registry, and Dollis Hill Research Depot, and the victories seem to have restored that confidence which was a notable feature of the team's work in the early months of the season.

The defeat of Dollis Hill, who have been leaders of the League for the greater part of the season, was particularly meritorious and the final score, 2—0, just about represented the difference in the two teams. The home forwards proved to be the better opportunists in a hard-fought game, although at one period of the game only superb goal-keeping kept the Dollis Hill forwards at bay.

The match against the Land Registry provided another keen and interesting encounter and resulted in a win by 3 goals to 1.

As against these two successes a close game with Customs, who are contending for the League leadership, ended in a draw of 2 goals each.

* * * *

The Telephone Play.

Rehearsals for the Telephone Musical Play, which is to be staged in April next, are actively in progress. The play bears the alluring title, "Telephone Tangles, or, Love in a Mist," and, when fully materialised, will prove to be another example of that happy combination of clever writing, tuneful music, charming dresses, and pretty faces, which Miss McMillan and her enthusiastic company have provided year by year.

The cast will include many well-known names. To mention some, there will be Miss Blair-Street—to give her the name by which she is best known to members of the London Telephonists' Society—Miss Latimer and Miss Price; Captain Hemsley, Mr. Whiffen and Mr. Hugh Williams. As in previous years, Mr. Pounds is the producer, while Mr. Cherry will be responsible for the scenery and effects.

Members of the London Telephonists' Society with recollections of the telephone plays of previous years will need no reminder to keep April 4 and 5 free of other engagements. As before, the play will be presented at King George's Hall, Caroline Street, Tottenham Court Road, and despite the close proximity of the performances and the Easter Holidays, a record attendance is confidently expected.

LIVERPOOL TELEPHONE NOTES.

MR. J. C. BURSTALL.—News has come to hand that Mr. F. Colin Burstall, late Traffic Supt., Class II at Liverpool, who, towards the end of 1925 went for a term of service with the Egyptian Government, has been appointed to the important position of Deputy Inspector-General of the Egyptian State Telegraphs and Telephones. We extend to him our heartiest congratulations. Mr. Burstall's earlier appointment, offering new opportunities and wider scope for his abilities, was confidently regarded as a step towards a successful career abroad. It comes, therefore, as no surprise to learn that within a period little more than three years he has been advanced to higher office.

Rapid progress is being made in the Egyptian Department of Communications, and within the Telephone System a very extensive programme is in hand—notably, conversions from manual to automatic switching. To these developments Mr. Burstall will, we feel sure, continue to bring wise direction and inspiration. We shall follow his work with the closest interest.

NOTTINGHAM TRAFFIC DEPARTMENT: VISIT TO MESSRS. ERICSSONS.

AN interesting visit was paid in January by the Traffic Staff of the North Midland Telephone District at Nottingham, through the instrumentality of Mr. G. Findley and by the courtesy of the Chief Engineer, to Messrs. Ericsson's Telephone Works, at Beeston.

Practically all the departments of the Works which cover many acres within sight of the beautiful Clifton Grove and near the river Trent were shown to the visitors.

Apparatus which is so familiar in our exchanges and apparatus rooms was seen in different stages of construction. One item attracted much attention, the "All-in-one-piece" telephone plug, which is turned out with great skill and rapidity and of which the firm has special reason to be proud. The imagination was put to the test by endeavouring to identify the various parts which were afterwards recognised as components of the auto switch gear.

After the tour of the works had been made the Firm very kindly provided tea, and during the progress of the meal Mr. C. N. Carter, Traffic Superintendent, expressed very hearty thanks for the pleasure and profit afforded by the visit.

THE

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All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.4.*

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXIII.

MR. FRANK RILEY.

MR. FRANK RILEY, Chief Superintendent of Telegraphs, Newcastle-on-Tyne, may be described in popular parlance as one of the bright young men of the Telegraph Service, having attained his present position at the unusually early age, in these days, of 42 years.

Possessed of an engaging manner, a sound sense of proportion, and a shrewdness native to his Yorkshire origin, Mr. Riley has made many friends who are not surprised at his progress.

Commencing his Post Office career at Sheffield in 1902, he became Telegraph Overseer in 1911. Two years later saw him Assistant Superintendent at Nottingham, and in 1919 he was promoted Telegraph Superintendent, Bradford.

Primarily a telegraph man, keenly alive to the possibilities and difficulties of that service, he was also associated with the sister service in the capacity of Trunk Exchange Manager in pre-transfer days and at Bradford his interest in telephones locally was helpful and constructive. When performing the duties of Assistant Postmaster he has also shown considerable adaptability in the mastery of detail.

A fund of dry humour finds expression on occasions when Mr. Riley can be induced to give some of his Fragsonesque numbers at the piano.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

III.—BY A CENTRAL TELEGRAPH OFFICE OVERSEER.

[NOTE.—*The Editing Committee accepts no responsibility for the views expressed in this series of articles.*]

THE Government telegraph service of the present day is subject to hard criticism by the British public, partly because it is a State Service, and the ordinary citizen is encouraged to decry all nationally-owned businesses—but largely for the reason that the telegraph as a quick and reliable means of communication has deteriorated. Users will agree that although the telephone meets many needs, it cannot be patronised to the exclusion of the telegraph and that the time is far off when the network of telegraphic communications throughout the United Kingdom can be abandoned. They are therefore disgruntled, and justly so, that a service which they are prepared to subsidise, as it is recognised it must be subsidised when widespread to nearly every town and village, is not as efficient as it could be made. They cavil a little at the subsidy when it is annually brought to their notice, but make no serious complaint. A good telegraph service they are prepared to pay for; it is any inferiority of service which is condemned.

The greatest improvement then, which will appeal to users, is not a slightly diminished annual deficit brought about by extreme measures of economy but the consolidation of quicker and more reliable methods. They would see gladly the necessary fractional increase in the national expenditure if their telegrams were dealt with expeditiously and without error. Such a service could be organised on businesslike lines.

First of all, the opportunity to telegraph at all reasonable hours and with little inconvenience. Every town of fair size should have at least one office of acceptance open from 7.0 a.m. until 11.0 p.m., and in the largest towns and cities an office open always. District Branch Offices should be open for acceptance until 10.0 p.m. in London and 9.0 p.m. in big provincial towns. No telegraph office should cease acceptance before 8.0 p.m. and all offices should remain open for delivery for at least half an hour after the hours of acceptance, for the telegraphic delivery the same evening without exceptions of all telegrams handed in. The public is not getting a square deal if messages paid for and accepted as telegrams are not treated as such. The practice of posting telegrams should cease. On Sundays and holidays, offices opening in the morning should open again later in the day; the opportunity to telegraph without the possibility of reply before the next day is not good business. The cost of such additional services would be practically only that of wages, with a small amount for lighting and heating. Other overhead charges, individual and accommodation, would be almost *nil*. The premises and the lines are there all the time.

The next thing is reliability. With the substitution of underground for overhead routes, excessive delays due to shortage of lines should be unheard of. There are too few spare lines on direct main routes. The most unfortunate breakdown, under modern possibilities, should not cause an additional delay of more than one extra transmission, and adequate staff and apparatus provision should be made for easy alternative main routing. Each zone centre should carry a generous reserve of staff and apparatus in order that any one centre may assist another with facility. Such reserve equipment of zone centres, at small percentage addition to the total telegraph expenditure, would have a remarkable effect in the stabilisation of the general service. The reliability of communications could be further improved by reducing the possibility of electrical and mechanical stoppages. The tendency is to attempt to work with too small a margin in every way. Conductors of low standard, low voltages, highest possible speeds and not enough reserve apparatus; all these things in combination reduce the stability of working. This traffic man or that engineer may propose various means by which margins can be reduced here and there, and show illusory savings; but their ideas are frequently more costly in the results. Experiment should be strictly limited by margins fixed to ensure continuous working on all lines with a minimum of electrical and mechanical trouble, and it cannot be emphasised too strongly that the primary function of both traffic and engineering sections is to maintain communications without interruptions, rather than to sacrifice reliability in order to reduce costs.

Regarding the variety of types of apparatus each of which is favoured by different sections or individuals, it is probably already recognised that the number of species now in use is far in excess of practical needs and must be reduced; also that further introductions, except some extraordinary improvement thoroughly proved, must be discouraged. Reliability of communications brought to a higher standard would affect appreciably the reliability of operator working. Much of the unsatisfactory transmission of to-day is caused by the high proportion of errors and corrections associated with automatic telegraphy badly treated. Errors which can be directly attributed to operating are to a great extent caused by the interruptions and distractions which take place through apparatus faults and stoppages over which the operator has no control. A trained operator able to proceed steadily, with confidence in his instrument, makes few mistakes, and is encouraged to good work by good results.

The next important factor is speed. Not speed of apparatus, for that should be governed by reliability, but the speed of transmission from sender to addressee. Assuming that no time is lost from counter to instrument, adequate staffing is, of course, the first need. Most of the delay now takes place at re-transmission stages, particularly in the large offices, and there the remedy should be applied. Staffing at every stage should be with the object of signalling each telegram immediately on arrival and avoiding accumulation. That pernicious system the "carry-over" should be eliminated from telegraph working arrangements. To provide only sufficient staff to deal with only part of the traffic coming to hand during any half-hourly or hourly period is simply to create delay at the source and to multiply that delay at each point of re-transmission. Ordinary circumstances in any large office, such as slight delay from originating offices, minutes lost in the change over of staff, minor stoppages, &c., will always provide a "carry-over." To arrange for an original "carry-over" to which is added that due to the ordinary circumstances mentioned, all to be multiplied at each re-transmission point, is rank bad business if speed of transmission is to be recognised as the main object of the invention of telegraphy. There is no doubt a higher average operator-output can be obtained by having always a supply of telegrams on hand waiting to go forward, but it is the type of economy which does not appeal to the taxpayer. They are his telegrams which are kept waiting. Operators should be waiting for telegrams, not telegrams for operators, if an efficient service is to be established. The speed of delivery, too, could be quickened. Particularly in London, delivery offices are too few in number, in some cases being as much as two miles apart, and this in business areas. The "walk" system, whereby telegrams are accumulated to be sent out in batches at intervals of $7\frac{1}{2}$, 10, or 15 minutes, causes unnecessary delay. There was much to be said in favour of the old "docket" system, when telegrams were sent out immediately if a messenger was available, and the boys were encouraged to make rapid journeys by the payment of a small commission based on the number of deliveries made. Naturally it would not do to go back to all the old practices, particularly the one where the docket rate was reduced if the boys were considered to be doing too well, but a commission rate as an addition to a reasonable wage would be worth introducing.

Before the telegraphs can be turned into a first-class business concern, however, not only must there be every effort made to deal with telegrams as really urgent communications to be passed through as quickly as possible, but there must be a serious attempt on the

part of those responsible for higher administration to improve the relationship between themselves and the staff which they control, that all may feel they are working together for a good service. There exists at present a cloud which must be dispelled. With the introduction of improved engineering and mechanical plant all the advantages have been seized for exchequer credit. The public gets its telegrams no cheaper and no quicker, the operator has to work as hard or harder than before. Operator output is gauged by estimating the highest possible number of transmissions per hour and multiplying by the number of working hours per week, and for many it is a life sentence. The act of cutting out all possibility of even momentary relaxation during hours outside peak pressure periods has automatically eliminated all reserve energy. An operator treated as part of the machine is likely to become machine-like. As well expect the machines themselves to initiate, co-operate, and take a pride in the business. Good work is still performed, but when minimum staffing at all times prevents the possibility of rising to any special occasion, enthusiasm becomes lessened. Every hour of the day must seem alike and such monotony is discouraging. Minimum staffing during peak hours is sometimes inevitable; at other periods reduced standards would not only relieve a continuous strain but would prevent those difficulties which occur frequently during maximum pressure from dragging on throughout the day. Further, a feeling has spread that the telegraphs are regarded as a dying concern, and that the ruthless curtailment of establishments is to hasten the funeral. Nothing short of definite changes in organisation and improvements in working conditions will revive a spirit which at one time never flagged. Greater attention to the comfort of the staff would be generally beneficial; well-ventilated, well-lighted, and bright offices are conducive to cheerful service. Good staff conditions must be made an important feature, as they are in every successful modern industry.

Given the right machinery, the official provision and intention to build up a fast service, the stimulation of staff interest and pride of service, then will be the time to go for more business.

Let the public know it can send telegrams early and late, with a fair chance of delivery the same day. Encourage registration of abbreviated telegraphic addresses by offering a permanent registration for one payment of one guinea, instead of an annual charge; telegraphic addresses on business correspondence bring more telegrams. Pass through as "Urgent" all prepaid replies. Cease charging twopence extra to the sender who does his own operating from a telephone call box. Abolish the extra charge for telegrams on Sundays. Brighten up the public offices, light them well, keep clean the windows—and advertise.

[The next article in this series, by a representative of the Imperial Cable and Wireless services, will appear in our May number.]

CORRESPONDENCE.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—Thirty years' observation of the troubles of the Telegraph Service leads me to suggest that the most urgent reforms necessary to save the service are:—

"RUSH," &C., CLASSES.

1. Provision of three classes of service:—

(*a*) "Priority" at treble ordinary rate;
(*b*) "Ordinary" rate;
(*c*) "Period" (or Deferred) at half rate.

Local Telegrams for delivery in same town at half rate.

FULL TIME DELIVERY.

2. Arrangements to be made with garages, hotels and any suitable subscriber on telephone for delivery, on commission basis, of urgent messages when usual means not available. Confirmatory copies being sent by post. This system should be tried in suitable localities. Fees being collected from addressee. Refusals of fee would be scarce, if message refused delivery.

ADVERTISE.

3. Publicity by means of posters on P.O. premises, outside and inside, giving propaganda matter similar to Underground posters. Total messages sent—Average time of transit—Percentage of failures—Averages of Priority—Deferred and local services, &c.

FREE ADDRESSES.

4. Free addresses—this would eliminate the expensive system of registered addresses, with its delay and errors. Large firms could use name and 'phone number which would be quicker and easier to circulate at delivery stage. Other messages would be easier to deliver and trace. The innovation would be immensely popular with the public, and would expedite the service.

OFFICE DELAY.

5. Reduce the serious "Drag" period in all offices by giving only one-hour collecting periods to collectors and insisting on *immediate* transfer of messages at *all* periods, especially slack hours and Sundays. Provision of conspicuous traffic cage for *all* circuits. Raising present collecting rack to more conspicuous height.

"A" FORM OBSTRUCTION AND RISK.

6. Eliminate the serious delay, especially on fast-speed circuits, caused by wrong signalling numbers of words and indistinct writing on "A" forms. This is a frequent occurrence and counter clerks should be compelled to re-write such words. The two faults should always be regarded as serious and deterrent action instituted to remove this cause of delay and risk to operators.

CONCENTRATOR EFFICIENCY.

7. Extension of concentrator system in large offices. This system, I believe, is extremely economical and adjustable to traffic, staff and apparatus maintenance. The costly installations of teleprinter system could be obviated, especially in view of the declining state of traffic.—Yours sincerely,

CONVINCED.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—I read with interest the remarks by a C.T.O. Telegraphist on how to improve the telegraphs.

In the main the arguments advanced are similar to those previously put forward on a number of occasions and are, relatively speaking, more for the improvement of local conditions than for the advancement of P.O. telegraphic business generally. When the telegraphs first became of public service they were, comparatively speaking, a novelty, and as such provided their own advertisement. There was nothing at the time to compete with such a service as was developed for speed and reliability of communication. The system was a self-centred, homogeneous organisation which came to be respected for its work and skilled personnel.

In time a serious competitor arose in the telephone, which has since absorbed much short-distance traffic. The convenience of the telephone has resulted in its taking premier place in the public notice and the telegram habit has dropped in favour of a telephone call.

Time has seen the growth of a number of cable companies which have attracted public attention. True they do not handle inland traffic, but they are prominent as examples of private enterprise as distinct from the P.O. and form a basis for comparison. The average Englishman usually makes good use of his right to criticise the Government—generally in a more or less ambiguous manner. We in the P.O. suffer from the effects of our own particular form of the eternal triangle. If we attempt a thing and make it pay, we are accused of doing so through unfair competition and to the detriment of private enterprise. If we make an attempt which fails there are gurglings of joy and talk of the "usual Government muddle." If we do nothing—then a commission is appointed and we get the verdict of "inertia."

This state of affairs is obviously very damaging to the efforts of any body of workers. The incentive of ungrudging appreciation from the public is too often lacking and we hear only of our errors and lapses.

Apart from the effects of trade depression I should say that perhaps one of the most serious causes of the diminution in telegraph traffic is the apparent subordination of this business to other Government services which are operated from practically all offices in the kingdom. It would appear that far more space, time, staff and general attention is bestowed on M.O. business, parcels, licences, pensions and similar services than is given to telegraphs. The attention of the public is directed far more prominently to these matters than to encouraging the sending of telegrams. The C.T.O. is waiting to handle a considerable increase in traffic. It did so in the past and can do so now. The machinery and apparatus are there in readiness and a willing staff is available to participate in an enthusiastic effort to revive their craft. In this respect we could achieve much by displaying a really prominent sign above every telegraph counter and provide adequate staff to convince the public that we are really anxious to get its business.

Furthermore, it is of paramount importance that we should be able to guarantee delivery within a certain time.

For this purpose it would be helpful to display charts at telegraph counters showing approximate delivery times to various centres, local and provincial. It is fully realised by private companies that the public is greatly influenced

by attractive forms and a neat businesslike presentation of the subject matter. Beam traffic emanating from T.S.F. is typed upon good substantial forms which can be effectively filed by the business man for future reference. But what of the traffic sent over the inland wires ? Are we certain that this is sent out in an equally attractive manner ?

The whole subject of our actual contact with the public must be overhauled and steps taken to see that only specialised officers are selected for accepting and interviewing duties. We must also insist upon the delivered copy coming up to modern standards and advertising telegraphic matters only. On the backs of all forms there should be printed a list of central or, more important still, the local offices, with their telephone numbers, from where the public may obtain a messenger.

The question of charges is a matter for separate and serious consideration of the specialists.

However, experience with cheap foreign greetings telegrams would indicate that there is scope for this class of traffic for inland telegraphs—say a rate of sixpence for anything in the nature of *bona fide* greetings or congratulatory messages. This, after all, is not much more than the cost of a birthday card and the necessary stamp.

There is field for enquiry and the need of some gentle persuasion in getting many of our business men to overhaul their telegraphic arrangements. The majority of them have little regard for themselves or other people when it comes to the question of actual delivery. It is usually a far more difficult and prolonged affair for a boy to deliver a telegram than for a postman to dispose of a bundle of letters. The messenger is sometimes at the mercy of certain hall porters and commissionaires, whose peculiar idea it is to regard all messengers as veritable imps of mischief and therefore help them as little as possible—the lift being absolutely taboo ! It invariably happens that the messenger must walk up to the second or third floor and through various departments to the firm's office and there await the attentions of any clerk who may be handy.

All this time there are probably several more telegrams in the boy's pouch for clients who must suffer for the inevitable delay. I feel certain that if these matters are given attention we shall see the desired result in an increase of telegraphic traffic—but the business must be boosted ! We cannot nowadays sit back and wait for traffic to come to us but we must go out and fetch it !

Increase in traffic must inevitably alleviate many of our internal problems.

Cable Room, W. F. CASHMORE.
Feb. 26.

LIVERPOOL TELEPHONE SERVICE NOTES.

ON the evening of Mar. 8 the male members of the Traffic staff met at the St. George Restaurant, under the chairmanship of Mr. Staite, Traffic Superintendent. The occasion was one which afforded the staff the opportunity of appreciative expression to one of our colleagues, Mr. J. R. Hill, whose recent promotion to the position of Traffic Superintendent, Class II, at Canterbury, gave us so much pleasure.

Guests of the evening were Mr. Gauntlett, our District Manager, Mr. Coombs, of Glasgow, and Mr. Hammett, who left us a little while ago to take up another Civil Service appointment in the city.

The evening opened with a Hot Pot supper, admirably cooked and well served. This was followed by a few words from the Chairman, who presented Mr. Hill with a couple of pipes ; these being supplementary to other gifts which were presented earlier in the day. Various tributes were then paid to Mr. Hill by his colleagues, followed by a few words from Mr. Gauntlett and Mr. Coombs. Mr. Hill responded in a manner wholly characteristic of him.

One could tell by the sincerity of utterance of the many tributes that the occasion was tinged with that feeling of sadness which must always accompany the loss of a colleague whose qualities have endeared him to all and everyone with whom he has come into contact. The tributes stressed the character of the man rather than that of the civil servant, and, as such, must surely occupy a warmer place in the recollections of Mr. Hill than could any tributes paid to official excellence only. We have sustained a real loss.

The presentation was followed by a musical entertainment, and a very pleasant evening passed all too quickly.

We have to congratulate Mr. G. Johnson, Asst. Traffic Superintendent, on the occasion of his marriage. The event was suitably recognised by the Traffic Staff, and no doubt our Manchester friends will join in the chorus " Better late than never."

A delayed social was held by the District Office staff on Mar. 1. The influenza epidemic was the cause of the delay, but happily all is now well. The social was a great success, and again the Traffic staff turned up in force. What a number of " young " lads and young ladies we have !

We offer the best of greetings to Mr. Askin, who has joined us from Shrewsbury.

INTERNATIONAL TELEPHONY.*

BY H. TOWNSHEND.

(*Continued from page* 108.)

Uniformity and Standardisation.—Representative views.

I will first quote the view expressed by Dr. Feyerabend, the permanent head of the German telephone service, in a very interesting book which he published recently on the occasion of the 50th anniversary of the invention of the telephone (" Fifty Years of the Telephone in Germany ").

" The reports of the C.C.I., which rest on the judgment of the experts of the European telephone administrations in this field, are indeed only valid as recommendations, but the International Telegraph Regulations prescribe that the Administrations should keep, as far as possible, to these lines. The Telegraph Conference, which took place in Paris in 1925, associated the C.C.I. with the World Telegraph Union. Since 1924 the C.C.I. has met regularly and does very useful work.

" The decisions of the Paris Telegraph Conference represent a substantial step forward. The working and administrative prescriptions are assimilated in a far-reaching manner to the tested regulations of the internal German telephone service, to the benefit of those circles engaged in foreign traffic. The new and detailed regulations correspond to the views of most of the Administrations and could, therefore, to a great extent be adopted in the Règlement " (i.e., the International Regulations) " as binding prescriptions. Special agreements " (i.e., between the individual administrations concerned in each international telephone service), " which certainly cannot yet be entirely dispensed with, are required only to amplify the Règlement in a few points. In particular, they must fix the charges (terminal and transit rates), as regards a unit basis for which the Paris Conference could arrive at no agreement. In the meantime, the C.C.I. has set out rules on the rate question upon which most of the Administrations are building. The former variegated nature of the international telephone service is, therefore, disappearing more and more."

It is interesting to compare with this the view of an English authority, Mr. Frank Gill, a past President of the Institute of Electrical Engineers and a Vice-President of the International Telephone and Telegraph Corporation, who has been intimately associated with the development of European telephony for many years and who took a very active part in the preliminary work leading up to the founding of the C.C.I. I quote from a paper which Mr. Gill read recently to the Post Office Telephone and Telegraph Society : " The functions of the C.C.I., so far, have been to form a common public opinion among the long-distance telephone authorities of Europe as to certain matters, such as specifications for the construction of land-lines, rules regarding maintenance and some standardisation of traffic and rating matters, though these two are not as advanced as what is known as the Transmission Section. But in daily operation of the " (international) " service much more than common opinion or a book of rules is required." (I am tempted to add—much more still than a book of rules without common opinion behind it.) . . . " In all this, it is not the adherence to prescribed standards that is so important ; it is rather the constant striving after better results, assisted by comparisons between divisions " (in Europe at present, countries) " which results in progressive efficiency."

You will see that both Dr. Feyerabend and Mr. Gill offer appreciative and constructive criticism of the achievements and methods of the International Telegraph Conference and the Consultative Committee—the former approaching the problem from the point of view of uniformity and the latter from the point of view of standardisation, in each case as a means to efficiency. I shall not venture to add anything further on this subject.

Finance.—Long-Distance Telephony Generally.

I now come to finance. Long-distance telephony is, of course, governed by the same general economic principles as other comparable public utilities, e.g., railways ; and the classical doctrines apply. The costs are mainly capital charges incurred in the provision, maintenance and renewal, when either worn-out or obsolete, of the expensive line plant, consisting mostly of large-capacity cables and their associated repeater stations ; staff costs are relatively small. The *amount* of line plant to be provided is determined by two factors :—

(1) The busy-hour traffic load, i.e., the average number and duration of the calls made per hour at the busiest time of the day ;

(2) The speed of service to be given at the busiest hour of the day.

As regards the busy-hour load, it is obvious that no additional line plant can ever be required to carry the calls outside the busiest time of the day ; if enough plant has been provided to carry the traffic in the busy hour without undue delay, the same plant will carry the lower load at any other hour with even less delay.

As regards the speed of busy-hour service, it is always possible within limits to allow orders for calls to accumulate during the busy hours, and so to be delayed to a certain extent, in order to save providing more international circuits on the route (which might be idle at other times) to dispose of the rush quickly. The extent to which it pays the Administrations and the public

*Paper read before the Institute of Public Administration on Dec. 13, 1928.

to spend money freely in providing line plant to give a really rapid service in the busy hour is a controversial point to which I will return later. It is sufficient here to note that this question of busy-hour speed of service is inextricably bound up with rate policy, which, of course, largely influences both the total volume of the traffic and its degree of concentration into the busy morning hours. The *type* of line plant is determined primarily by engineering considerations; since, at any given time, when laying a new cable, &c., it practically always pays to put down one which will give the best possible speech transmission. The cost side of the accounts, which, as we have seen, depends mainly on the amount and type of line plant laid down, is therefore largely governed by two factors:—(1) Technical developments, and (2) the effect on traffic development and concentration of the rate policy adopted. On the revenue side, the governing factor is obviously the rate policy. The problem of rate fixing, or "tarification," is, therefore, fundamental to the finance of long-distance telephone service, and is bound up with the question of the speed of service to be aimed at.

Indeed, it is obvious that in any public utility supplied mainly by capital plant, the use of which is paid for by means of charges for individual services rendered—as distinct from utilities such as roads, which are provided free of direct immediate payment, or water supply, which is paid for by a levy whose incidence does not correspond very closely or immediately with individual consumption—the tarification policy adopted by the controlling authorities determines the point up to which each consumer's economic demand becomes effective, and so, indirectly but effectively, controls both the volume and the direction of the stream of capital flowing in to provide and keep up the plant. To treat tarification in such a utility as a mere question of cost accounting is to ignore the variations in the form of demand curves, and to throw overboard altogether the ultimate criterion of maximum satisfaction. There was, however, at one time a grave danger of this happening in Europe.

Finance of International Telephony.

In the case of international telephone service, the general principles of public utility tarification are modified both in theory and in their practical application by the peculiar conditions which necessarily obtain. In order to discuss these special conditions and their effect, it is convenient to summarise the recognised economic principles governing the general case.

General Principles of Rating.

It is, of course, common ground that the *general level* of rates in a public utility should be sufficient to cover the costs (interest on capital raised, including a sufficient element of profit to provide for development or research expenditure, depreciation, maintenance and operating) averaged over a sufficient period to allow for growth, the replacement of plant at possibly enhanced cost and the adoption of improved technical methods. The principles for determining *individual* rates may be put in the form that the rate for any service should be fixed primarily on what the traffic (i.e., the economic demand for that class of service) will, in fact, bear, rather than on what the individual class of service is supposed to cost. I say, "supposed to cost," because, as is, of course, well-known, where capital charges are the preponderating item in the total cost of an undertaking (and this is essentially the case in long-distance telephone service), there is always an element of doubt about the answer to the question, what does any particular class of service cost? This doubt is due to a theoretical ambiguity and cannot be resolved by any form of cost accounting, however elaborate. (This is, of course, a familiar general point in works on costing, and is not confined in its application to public utilities.) Since, however, most people naturally think about the rates they pay for a public utility in relation to costs, real or supposed, the classical principle can be translated into popular terms with rough accuracy as follows: The charge for any individual service in a public utility should be related to the special cost of that service (in the ordinary economic sense of the gross cost which the Administrations would save if they ceased altogether to provide that particular class of service, *other things remaining unchanged*) plus an appropriate fraction of the general or overhead costs of the whole utility, these fractions covering in the aggregate the whole of the general costs, and the fraction assigned to each individual service varying more or less inversely with the elasticity of the demand for that service.

General Inferences about Rating.

A few general conclusions about long-distance telephone rates can be drawn directly from these general principles. In the first place, as regards the general practice of accepting calls during the slack hours of the evening and at night at lower rates than in the day time, there is often a good deal of confusion of thought which can, I think, be avoided by going back to first principles. I have heard it argued that, since no line plant has to be provided to carry traffic at night, such traffic should be accepted at very low rates indeed, calculated at a level not much higher than would cover the operating costs. This argument, of course, comes from people who want to use the line at night. On the other hand, the view has been held, though not generally, that it is unfair to the ordinary user, who wants the bulk of his calls in the day time and has not much use for a cheap night service, to accept calls at night at anything less than the ordinary day rate. As the general theory shows, the criterion is the answer to the question—Is the demand for calls at night an elastic one? Or, in other words, will a reasonably low night rate bring in enough traffic during those hours to increase the total return on the line over a period of years? In general, the answer is yes; but obviously the night rates must not be too low or the effect of the differential, even if it does attract additional traffic, will merely be to lower the total return. If, however, the differential rate is properly fixed, so that the *total* returns are increased, its effect is to benefit not only the people who take direct advantage of it but also the ordinary busy-hour user, because, in the long run, the additional returns enable the general level of rates to be kept down.

Generally speaking, the correct fixing of almost any kind of international telephone rate involves a judgment about the degree of elasticity of the public demand for the particular service which is being dealt with. This is, indeed, only natural; it is precisely that kind of judgment which the business man is always consciously or unconsciously exercising—whether it be the directorate of a large firm studying the profitable exploitation of bye products or a small shopkeeper selling perishable goods cheap on Saturday nights. The particular question of night rates which I have cited as an example of long-distance telephone tarification is one upon which telephone authorities are now practically all in agreement. Unfortunately, however, this is not yet the case in regard to the general principles which should govern the rating of auxiliary or accessory services. As regards these, it follows, I think, from the general economic principles, that there should be a bias in favour of fixing the main rate at a sufficiently remunerative level not only to pay for a reasonably rapid busy hour service but also to enable the public to be offered such accessory services as they desire cheaply, without too much regard to the supposed average additional cost of the accessory services. A really useful accessory service, by bringing in additional ordinary traffic at a remunerative level, will increase the returns on the whole undertaking, even if the additional charges for the accessory facility itself are barely sufficient to cover its cost, considered separately.

Special Conditions of International Telephony.

So much for general principles; now to consider their application in the special condition of *international* service. Both the main principles, that governing the general level of rates and that which should guide the policy in fixing charges for particular classes of service, tacitly assume control of the whole utility by a single authority. But in the international telephone services there is no such authority. The telephone service between each pair of countries is conducted jointly by two or more independent telephone Administrations—usually national—who each provide, at their own expense, plant situated on their own territory. For example, both the cost of, and the revenue derived from, telephone calls between England and Sweden are shared between the Governments of Sweden, Germany, Holland and Great Britain. But these authorities are also each similarly interested in other international telephone services, as well as in their internal services. It may be presumed that accounts exist in each country for the international services in which it is interested taken as a whole, so that a general European, or even world, international telephone account could theoretically be made up by taking all the accounts of the separate countries and adding the respective cost and revenue sides together. Of course, no one is in a position to do this. Further, even if it were done, such an account could not be used to guide rate policy, because each country naturally requires its own international services to pay their way, and it is certain that neither in theory nor in practice would this result follow unless the revenue and costing elements of each country were treated separately. In practice, of course, this is what happens. The rate for a telephone call from Great Britain to Sweden, for example, is made up of 4 elements: The charge accruing to Sweden, that accruing to Great Britain and those accruing to the transit countries, Holland and Germany. This is equally true of the corresponding costs. This brings in two important points, one bearing on the question of the general level of rates; the other, on rates in individual services.

National Cost Levels—Interests of Transit Countries.

First, although plant may be more or less standardised as between the different countries, the gold cost of this plant is not so standardised. It is well known, for example, that in Europe some countries are countries of cheap engineering costs, and others of dear costs. Secondly, in considering the rates in individual telephone relations, that is, for calls between two given countries, it has to be borne in mind that, although all the countries providing the plant have a common financial interest in seeing that their share of the service pays its way, the terminal countries have a more direct interest in seeing that the (total) rate for each class of service offered is properly adjusted to the economic demand, and that the accessory facilities are suitable and adequate, because if any of them are not, their public will remind them of the fact. Fortunately, most countries are countries of transit for some telephone relations, as well as terminal countries in regard to their own international telephone services. But in so far as this is not yet the case, the preponderatingly transit countries, being as such out of direct touch with the users of the utility, naturally tend to take what is traditionally called a "Treasury" view of rating questions—with a tendency to overemphasise the costing side of the economic position, to mistrust advocates of elastic rating schemes (e.g. in connexion with accessory services) designed to attract remunerative traffic in the future, and generally to adopt a protective rather than a bold rate policy, aiming less at trying to exploit profitably the public demand (in other countries) for service by means of their cables than to avoid incurring any risk of loss on individual calls, or classes of call, in the interests of foreign telephone users. It is only right to add that in regard to provision of plant, as distinct from operating and rating questions, most of the transit countries have adopted a far-sighted policy and have laid expensive cables freely to provide for anticipated growth of traffic passing through their territory; indeed, the rapid development of European international telephony during the last few years has been in no small measure due to this.

(*To be continued.*)

TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—*The Times* Canberra correspondent states that the Government is making arrangements to assume control of broadcasting throughout Australia on July 1, and tenders are invited for the supply of large quantities of material.

The telegraphic transmission of pictures between Melbourne and Sydney will be begun in the next two months.

BOUVET ISLAND.—Over twelve months ago, anxious to give our readers every scrap of news concerning telegraphy, it was announced in these columns that an expedition had already set out from Norway well equipped with *radio apparatus, meteorological gear and stores. There was even some* debate as to the ownership of this island. However, the island—or iceberg, as some aver it to be—refuses to be landed upon, and the expedition has returned to Cape Town.

CANADA.—Trans-Canada Communications, Ltd., with headquarters in Toronto, has been incorporated, with a capital of $1,000,000 (£200,000). Its charter includes everything pertaining to radio, including power to operate broadcasting stations, to manufacture or deal, and provide regular inter-city communication.

Receiving licences for the nine months ended Dec. 31 last totalled 243,768. *In all the provinces, a steady increase over the corresponding* period in 1927 was maintained.

The Commission of Inquiry into Broadcasting, which arrived in England on Jan. 15 by the White Star Liner *Baltic*, subsequently included Sir John Aird, its Chairman, whose sailing from Montreal was delayed. After studying *broadcasting conditions in England, the Commission visited Switzerland* and Germany before returning to consider the situation in Canada.

A conference on short waves took place at Ottawa in the latter part of January. The United States was represented by three members of the Federal Radio Commission, two of the Navy, and an assistant solicitor of the Department of State; Canada by the Deputy Minister of Marine and Fisheries, the director of the Radio Branch of that Department, and others connected with radio work in the Federal Government. Newfoundland, Mexico and Cuba were also invited to send representatives, who were present. Their recommendations were later reported to the plenary conference which, it is expected, will approve of them.

According to *World-Radio*, the recommendations are as follows: "The Governments agree to adopt a frequency standard based on the unit of time, and to compare at least once every six months the actual radio-frequency measuring standards; all stations other than mobile and amateur stations to tune their transmitters within an accuracy of 0.025%, or better, of their national frequency standard; and to maintain their frequency with an accuracy of 0.05%, or better, at all times. Each Government agrees to adopt for the present separation of 0.2% between channels; for commercial telephony a band width of six kilocycles will be permitted; for the present, a 100-kilocycle band width will be considered standard for television; to use transmitters which are as free as practicable from all emissions (such as harmonics, decrement, spacing waves, frequency modulation, key clicks, type of keying, mush, &c.) not essential to the type of communication carried on, which would be detrimental to communication being carried on by stations in other countries."

One can hardly overlook the significant mention of "television" and the measure of confidence suggested in its future by the reservation of a band for its use.

Carrier-current facilities.—The Bell Telephone Co., of Canada, contemplates an expenditure, says *The Electrical Review*, of $27,000,000 during 1929 on construction and expansion of facilities on its lines in Eastern Canada. This will be the highest appropriation in the history of the company, comparing with $22,000,000 during last year, which in turn was $4,000,000 larger than the 1927 amount. Of the $27,000,000 for this year, $7,000,000 will be for extending long-distance lines, including expenditure on new carrier-current facilities, new cables, &c. Part of the total is for the new headquarters *building in Montreal, which will be ready for occupation in five or six months;* eleven major building projects are under way.

GERMANY.—"We learn that tests have now been completed with the Korn photo-telegraphy apparatus which will allow German police to transmit finger-prints and photographs of wanted criminals by wireless. Sets of apparatus are being installed at Berlin and Breslau, and they will shortly be in use, Professor Arthur Korn said. Great improvements are said to have been incorporated in the latest apparatus, the whole picture is transmitted and received in one minute, which means that 5,000 of the points building up the picture are dealt with every second. The police will send all their telegrams as well as finger-prints and photographs by photo-telegraphy. They will simply write out their messages and transmit them as though they were pictures."

Brittain Scienservice, my informant, completes this paragraph by saying "Then mistakes will be impossible," which claim one might venture is likely to prove an impossible one to maintain.

Satisfactory results are claimed to have been obtained with a new method adopted by the Fultograph Gesellschaft for the transmission of still pictures. The altered system, which allows the immediate transmission of topical pictures, was first used on Feb. 21, by the Königswusterhausen station. Hitherto the Fulton system has necessitated the conversion of the picture at the transmitting end into a specially prepared foil, covered in varying *degrees with insulating material. The new method replaces the metal point* used in connection with the prepared foil to produce the electrical oscillations by a very fine ray of light, which plays upon a rotating glass cylinder, on which a photographic negative is placed. A Kalium cell inside the cylinder converts the light impulses into the required electrical impulses. Pictures have been transmitted on the Fulton system from the German national station at Königswusterhausen since Nov. 20 last. The hours of transmission are from 9.45 to 10.15 p.m. (Greenwich mean time) on Tuesdays and Fridays, and 12.45 to 1.15 p.m. on the other week-days and Sundays.

GREAT BRITAIN.—According to the British Broadcasting Corporation's estimates, the number of *listeners during December, 1928, and January, 1929,* increased by about 500,000, one of the biggest advances recorded. The increase in the number of licences for the two months is stated to be over 120,000, and is 20,000 more than the figures for the same months last year. The number of licences at the end of February was 2,690,116.

The *Wireless World* states that the exports of radio apparatus from this country during November last had a value of £84,049 (including valves £9,960). The principal buyer was the Netherlands, whose share was valued at £11,241 (valves £60). The next in order were Australia, £10,111 (valves £2,285); France, £7,301 (valves £174); Irish Free State, £6,042 (valves £929); India and Burma, £3,349 (valves £241); Rumania, £3,175 (valves £373); Germany, £3,167 (valves £82); and Italy, £3,126 (valves £16).

London.—The Faraday Centenary.—A meeting of British engineers and scientists was held at the Royal Institution on Feb. 15, under the presidency of Sir Arthur Keith, to arrange for the celebration in 1931 of the centenary of Michael Faraday's great discovery of electro-magnetic induction. A number of societies and organisations were represented, including the Royal Society, the British Association, the Institution of Electrical Engineers, the Institution of Mechanical Engineers, the Electricity Commissioners, and the British Broadcasting Corporation.

Parkeston.—A coastal wireless station at Parkeston and three new steamers for the L. & N.E. Railway Co.'s continental route, *via* Harwich-Hook of Holland, are to be equipped with Marconi valve transmitting apparatus. The interrupted-continuous-wave method of signalling will be used and the transmitters will each have a power of 1½ kilowatts and work on wavelengths between 600 and 800 metres.

Portishead.—It is exceedingly interesting to note the tribute paid by a French steam trawler engaged in long-distance fishing in the neighbourhood of New Amsterdam, in the Indian Ocean, to the excellent short-wave service the French operator was able to obtain with Portishead radio station.

The steamer is one of a fleet owned by *La Langouste Francaise* (now, then, ye experts in French menus !), and from letters which the writer holds, it is clear that the absolute sharpness of the signals received from the English station, the ease with which the telegrams were dealt with and their subsequent rapid disposal to their French destination, have evidently given more than usual satisfaction.

Swindon.—In a review of the progress of the Great Western Railway during last year it is mentioned that a system of wired-wireless has been adopted, giving an additional channel of communication between Reading and Swindon. Transmission from Reading is on a wavelength of 6,000 metres, and from Swindon of 7,000 metres.

On the occasion of the first ordinary general meeting of the Baird Television Co., Ltd., Sir Edward Manville (chairman), who presided, said that owing to questions which had been asked in the House of Commons the directors had been compelled to call the meeting earlier than they desired. He claimed that the company's system had attained a remarkable degree of perfection, and although at present the "televised" images were on a small scale, they hoped soon to be able to obtain the same degree of perfection on a larger scale. The Baird International Television Co. was in negotiation for the establishment of broadcasting of television on the Baird system in most parts of the world. The company owned two-thirds of the results of the International Co. from dealing with the patents outside the United Kingdom. The International Co. was formed with a capital of £700,000 so arranged as to give a working capital of a sum exceeding a quarter of a million pounds. Negotiations were in progress for the formation of companies in the Colonies and many foreign countries. Transmitting and receiving apparatus was now being installed in the chief Berlin wireless stations, and at least seven Continental broadcasting stations (including Radio-Paris) had invited the company to install transmitters. The company did not intend to manufacture receiving apparatus, but it had produced a number of such instruments to satisfy the first demand to a certain extent. Another direction in which the company was working was "Phonovision," the recording of images for subsequent reproduction with the sounds corresponding to them. Then there was also "Noctovision" and fac-simile telegraphy. One side line from which they were drawing royalties was a distortionless amplifier circuit. Arrangements had been made with an important French company for the establishment of broadcasting and television in almost all the principal centres of the Continent. After the chairman had answered a number of questions, the report was adopted.

Great possibilities are claimed for an invention that has been patented under the title of "an improved transmitter and remote recording system

and apparatus therefor," says *The Electrical Review*, and to which our contemporary gives the name "Telfograph." Simple in the extreme, it consists solely of a small instrument, a few inches square, which acts either as a transmitter or a receiver of written messages, the connecting medium being either a telephone wire or wireless circuit. Its cheapness (the inventor, Mr. Archibald E. Telford, and the owner of the patent rights, Mr. W. J. Bullmore, stated to the *Morning Post*) supports the claim that it could be used by every telephone subscriber for receiving and transmitting written messages. The instrument contains a small typewriter of one key only, and a revolving drum on which the letters of the alphabet are arranged in suitable formation; a person can tap out the required letters, which are typed on tape automatically at either end of the telephone line. Should the engaged signal be given, the operation can still take place, and a message collected later by people when they return home.

Listening in to the Herrings!—Rear-Admiral H. P. Douglas, Hydrographer of the British Navy, recently revealed to members of the Royal Geographical Society that echo-sounding apparatus is now being used in an improved form for locating fish—the herring, for example.

"Fifteen trawlers," it is stated, "have now been fitted with the echo-sounder," and by listening in the "echo-sounder has proved of inestimable value in finding the banks where the fishing is good."

IRISH FREE STATE.—At present there are 26,000 receiving licenceholders in the Free State, bringing in a revenue of £13,000; on Mar. 31, 1928, the number was 24,000. On Jan. 13, 1929, the wavelength of the Dublin station (2RN) was changed from 319 to 411 metres, in conformity with the European redistribution. The Free State intends to be represented at the international conference which is to take place at Prague in April next. The Post Office recently submitted to the Ministry of Finance a memorandum on the service, including the proposal to erect a high-power station. There are now three studios, a new one having been opened last year in the P.O. buildings in Dublin.

JUGO-SLAVIA.—*World-Radio* informs us that before the opening tests last September of the new transmitter at Ljubljana, which serves the whole of Slovenia, Zagreb was considered the "local" station for Slovenia. When Ljubljana took over on Oct. 1, 1928, there were exactly 2,512 licences in force in Slovenia, the latest figure is 4,246, and since Jan. 1, 1929, the 5,000 mark has been passed. The number of actual listeners may be four times the number of licences, or about 20,000. Ljubljana is, of course, close to the Italian frontier; the Italian authorities, however, do not issue licences for sets within 30 km. of the frontier.

LUXEMBOURG.—*Wireless and the Movies!*—A Luxemburg scientist living near Paris has recently completed an intricate, but apparently practical, device for the transmission of moving pictures by wireless, says *Commerce Reports*. While the transmission and reprojection of films by wireless has already been accomplished by various means, in the present instance the size of the image transmitted is not limited; in fact, the perfection of the image reproduced increases with the size of the screen. The use of a positive film is eliminated, the transmission being accomplished by using the negative film direct, obviously an important consideration from the point of view of the rapidity with which pictorial news items, for example, could be displayed. The transmission and reproduction of the film do not necessarily take place at the time the negative is projected into the apparatus: the impression of the film is electrically transmitted and magnetically conserved (on a series of fine metallic ribbons) in such manner as to permit its subsequent wireless transmission for exposure on the screen, or screens, either immediately or at a later time. The conservation of the intermediate magnetic impression being more or less indefinite, the wireless transmission of the picture can be repeated without further recourse to the original negative film. The registration of sound can be accomplished simultaneously with that of the moving picture itself, so that talking films can be projected into the device, magnetically conserved, and transmitted by wireless for reproduction.

NEW ZEALAND.—From official New Zealand sources we learn that there are now 42,801 listeners' licences in force, besides 169 transmitting and 1,464 dealers' licences.

The *Daily Telegraph* correspondent in Wellington says that the American receiving sets have been dominating the market, but improvements made by British manufacturers have enabled them to secure a good proportion of the trade. German makes are in the market, and competition is being experienced from Australia.

RUSSIA.—Reuter's Moscow agency states that since the beginning of this year the whole business of broadcasting in the U.S.S.R. has been placed in the hands of the Commissariat of Posts and Telegraphs. A radio university has been opened (in addition to the existing technical and agriculture courses), the lectures of which are given only by radio. On Oct. 1, 1928, there were 326,285 registered radio sets in the U.S.S.R., 1.5 times as many as in 1927. This year the Commissariat of Posts and Telegraphs has been considerably extending the "radiofication" of villages by the adoption of the system of broadcasting by wire. According to the estimates of the Commissariat, the wire system should increase the number of radio listeners at the end of this year by more that a million. The broadcasting stations are now experimenting with so-called radio-films. Radio theatres have been opened in Moscow and Leningrad. On Aug. 1, 1929, a new radio station is to be opened in Moscow with a power of 75 kw.; its construction will cost 1,800,000 roubles.

SOUTH AFRICA.—Reuter, cabling from Cape Town, states that in replying in the Union House of Assembly to a question regarding the Imperial Cable and Wireless Merger, Mr. Sampson, the Minister of Posts and Telegraphs, said:—

"I do not think any Government of South Africa would confer on the existing wireless company, or any possible future combined wireless and cable company, a sole monopoly of all foreign wireless communications."

The following is apparently a further and expanded statement by Mr. Sampson, Minister of Posts, who, according to the same agency, made a communication with regard to his statement in Parliament on Feb. 12 respecting the Imperial cable and wireless merger. Reports suggested that Mr. Sampson's statement confirmed fears that the Union might establish some sort of service to compete with the merger, but Mr. Sampson emphasised that nothing in his earlier pronouncement justified such an interpretation; indeed, there was now no reason, after certain adjustments had been made, why a Government licence should not be issued to the Wireless Telegraph Company of South Africa. How could the Government grant a licence and at the same time set up competition against the South African Company? The Government did not contemplate such competition, and it would not be appropriate for the Government to exercise any pressure for the formation of a merger in South Africa, but if a merger were negotiated on voluntary lines by the cable and wireless interests, the Government had no power to oppose it, provided the terms of the Government licence and the Act were adhered to. The Government would insist on the full responsibility of the party concerned in carrying out its contract, whether it were a wireless company, a merger, or any other body. The British Post Office had, in connexion with the merger negotiations, reserved to itself the rights of telephony. He felt that the Union Government, in conjunction with the "beam" service, could possibly come to an arrangement on that matter and that terms also acceptable to the British Post Office could be arranged at the British end.

According to the *Daily Mail*, the British Post Office is awaiting the end of negotiations in the respective Dominions before beginning tests between England and Australia, South Africa and India.

U.S.A.—*The Ford Car and Radio.*—Reuter's Washington agency reports that the Ford Motor Car Co. has applied for permission to erect a new wireless station to enable it to communicate with the Ford rubber plantations in Brazil for both private and limited public service.

The new Universal Wireless Communications Co., which was recently granted forty of the seventy available commercial short-wave radio channels by the Federal Radio Commission, over the Radio Corporation of America, the Postal Telegraph-Cable Co., and other applicants, is already facing the possibility of a Congressional investigation as to "where it got the pull" and who, if anyone, is behind it politically. The transaction is reported by the *T. & T. Age* to have caused much discussion at the Radio Conference at Ottawa, Canada, which is trying to settle the intermediate-wave band on the North American continent amicably with delegates from the United States. The Universal Wireless Communications Co. is said to be organised by financiers in Buffalo, N.Y., with a backing of about $25,000,000, and claims that it intends to establish radio service between 110 cities in 48 States.

Nevertheless, Reuter's New York agency records that the Radio Corporation of America's annual report describes 1928 as the best year since the organisation was formed, the income for 1928 amounted to £4,732,397, as against £2,359,930 the preceding year.

The same agency reports that Mr. Newcomb Carlton, president of the Western Union Telegraph Co., stated on his return from Europe that a communications merger between the Radio Corporation of America (which works in conjunction with the European services of Marconi) and the Western Union Co. was still under discussion, but no definite decision had yet been reached.

The announcement that the laying of a transatlantic telephone cable between America and England was contemplated by the American Telephone & Telegraph Co. during the next five or six years was not a surprise to most of the cable technicians. The *Daily Telegraph's* New York correspondent cables: "The tremendous increase in the number of continent-to-continent calls by radiophony already threatens to overtax the wireless facilities, according to Mr. Walter Gifford, president of the company. The new telephone cable, the construction details of which the engineers have already worked out, will provide another means of transatlantic communication of maximum reliability. The cost of the cable is not stated, but it will be included in a sum of £400,000,000, which the company will spend on developments in five years."

WEST AFRICA.—The London *Times* reports that a wireless station is being built at Takoradi, Gold Coast. It will be equipped for communication with other West African colonies and to link up with the nearest stations of the main Empire service.

GENERAL AND PERSONAL.—*Parliamentary Queries and Replies.*—On Feb. 13 Sir Nicholas Grattan-Doyle asked the Postmaster-General if he would state what, for the year 1928, was the cost of the service organised by his department for the purpose of detecting radio apparatus operated without licences; what amount was recovered by fines; how many prosecutions were instituted; and whether the balance of expenditure was charged against the cost of the department or was deducted from the revenue from broadcasting licences.

Sir W. Mitchell-Thomson said it was not possible, without undue cost in accounting, to segregate the cost of the specific work of detecting radio apparatus operated without licences. 1,135 prosecutions were instituted in 1928, and convictions were obtained in all but seven cases. The total amount of fines recovered, including costs where granted, was £1,186. The difference between the cost of the prosecutions and the amounts recovered was borne out of the proportion of the licence revenue which was retained for management.

On Feb. 14 Lord Wolmer, the Assistant Postmaster-General, informed Mr. Wellock that for the period from April 1 to Dec. 31 last the gross receipts of the Post Office from the Imperial "beam" wireless services were estimated at about £358,000. The credit balance in respect of the same period (before charging depreciation or interest on capital) was estimated at about £152,000.

On Feb. 21 Commander Bellairs asked the Postmaster-General, in view of the loss of £1,300,000 or more per annum on the inland telegraphs, whether he was aware that the Hardman-Lever Committee of 1927 was not permitted to consider the aspect of transfer to private enterprise; and whether, as the situation had been changed by recent legislation transferring the external cables to the new Communications Company, the Government would open negotiations on similar lines with that company with regard to the remaining telegraphs.

Mr. F. G. Penny, who replied, said that the circumstances under which certain overseas services were to be transferred to a Communications Company had no analogy in the case of the inland service; and the reply to the latter part of the question was in the negative.

Commander Bellairs also asked the Postmaster-General whether he was aware that, in Section 66 of the Hardman-Lever Report of 1927, the Committee unanimously advised that the possibility of the complete fusion of the telegraph, cable, wireless and telephone services might with advantage be explored; and whether it was the intention of the Government to obtain the evidence of officials of American companies.

Mr. F. G. Penny said that the answer to the first part of the question was in the affirmative, and to the second part in the negative.

On Mar. 5 Sir William Mitchell-Thomson, Postmaster-General, in reply to Mr. Thurtle (Lab.-Soc., Shoreditch), stated that on the invitation of the Post Office a demonstration of the Baird television system had taken place and was witnessed by a few members of all Parliamentary parties, in addition to representatives of the B.B.C. and the Baird Company. It was necessary to restrict the number because at present the nature of the apparatus made it impossible for more than a few persons to witness the experiment simultaneously.

CONTRACTS.—April 15.—Wellington, N.Z.—Post and Telegraph Department.—Supply of conductor cords. (D.O.T.)

OBITUARIES.—Though somewhat late one cannot but pay tribute to a tribute which *The Electrical Review* proprietors paid to their much-respected and beloved Arthur Hinton Allen, Technical Editor of the journal mentioned. Mr. Allen was only in his 57th year when, influenza and pneumonia close following, there "passed quietly on," quoting the words of our contemporary, "a man of pioneering spirit in scientific thought, research and practice, the advocate and champion of many an electrical movement, a straight and honourable gentleman who could give no quarter to a sham."

During the funeral of the late Sir John Denison-Pender, chairman of the Eastern Telegraph Co., the telegraph circuits throughout the whole of the far-flung system of the company were stopped for one minute, the staffs on duty standing in silence to honour their dead.

On Feb. 19 there passed away an at one time well-known figure in the C.T.O., Mr. Frank Farnam, after a sudden and brief attack of meningitis. Mr. Farnam retired in 1912 with the rank of Asst.-Supt. 1. As a telegraphist he was an old-time Wheatstone expert, and was frequently sent to special events. On one occasion a unique incident happened to himself and four other colleagues when detained at Newbury P.O. till 1.45 a.m. in order to dispose of a speech of 20,000 words by Lord Carnarvon. Getting back late to their hotel, mine host thereof who happened to be of an opposite opinion to the chief speaker of the evening, refused to re-admit the five special telegraphists because they "had to do with a Tory meeting," so shut down the window and went to bed. It was raining hard and the police-station was the only refuge of the party!

The Post Office, however, took a serious view of the affair and mine host appeared at Reading a month or two later, before Baron Huddlestone, as to whether he had any reasons to put forward, &c., &c. The delinquent was suitably dealt with by the judge.

There must be some special attraction for retired C.T.O. officers in Algeria, for hardly had last month's columns been printed with the note that Mr. Bradley, formerly Supt., was visiting that country, than information came to hand that the Misses F. D. Stokes, Miss A. Wyatt and Miss E. R. Wright, all former Chief Supervisors, C.T.O., had just left on a tour in Italy, ALGERIA, &c.!

BUSINESS ADJUSTMENTS OF TO-DAY.—"Every business enterprise must in this highly commercialised age be prepared to adjust itself to any national change affecting its competitive status."—*Sir Josiah Stamp.*

J. J. T.

GLASGOW TELEPHONE NOTES.

THERE was a wonderful "gathering of the clans" on Wednesday, Feb. 27, in Central Exchange Retiring Room, when Col. Westbury presided over what was probably the most representative Staff Meeting ever held in this district. The occasion was the climax of the series of Official Meetings held during the past winter and anticipations were more than realised. Altogether there would be about 50 persons present. Each grade of the staff—day and night—was represented, officially and "associationally." Mr. H. West, the Head Postmaster of Paisley, was also present. The tone of the proceedings and the general atmosphere surrounding the talks of everyone concerned left no doubt whatever as to the efficacy and desirability of a movement such as this.

We have once again concluded a strenuous season of public official lectures on the Service. In the Session 1927-28 our readers will remember that 33 of these lectures were given to an aggregate "audience" of 4,067. During the current Session there have been 23 meetings with an aggregate attendance of 3,238. Over the two Sessions, therefore, 56 meetings have been held and 7,305 members of the public have listened to—and we think, enjoyed—our expositions and demonstrations of the service "from within." It will be seen that the average attendance per meeting works out at 130, which figure speaks for itself, not only as to the keenness of Glasgow audiences, but as to the sustained interest of the public in "telephones." The "Lecture Party" are to be heartily congratulated on their spirit and effort.

We regret to announce, and old members of the Glasgow Staff serving in other districts will regret to learn, that Mr. J. G. Mackay, Assistant Traffic Superintendent, passed away on Mar. 9 after a long illness. Prior to his superannuation early in October last, John had spent almost two years in a sanatorium seeking to regain health and strength, and it looked at one time as though he had been successful. He did in fact resume duty in August last, but the effort appeared to be too much. Messrs. Johnson (Traffic Supt.), Macdonald, Kennedy, Harvey, and Kerr represented the staff at the graveside, and floral tributes from the staff marked the passing of a popular A.T.S.

In place of the usual bi-monthly concert a Whist Drive, promoted by the Trunk Exchange staff, was held on Friday, Mar. 1, for the entertainment of the wounded soldiers at Bellahouston Hospital. A pleasing feature of the social was the substitution at whist of the men who are still confined to bed by their lady visitors, two of whom secured prizes for their protégés. Tea followed play, and then the prizes were presented by Miss Kay, who aptly expressed her own pleasure and that of her staff in again meeting those "who had done so much for us." One of the soldiers suitably responded on behalf of himself and colleagues to "Miss Kay's gracious remarks," and thanked the staff for a very happy evening.

A further successful Staff gathering was held on Wednesday, Mar. 13, in Green's Ball Room, Renfield Street, when a goodly and representative assembly foregathered for music and dancing. We were again favoured by the presence of Col. and Mrs. Westbury, Mr. and Mrs. A. E. Coombs, Mr. and Mrs. Johnson and others. Miss H. B. Mowat was in charge of the arrangements, than which nothing more falls to be said!

Our cordial congratulations to Miss A. W. Thompson, Assistant Supervisor II, on her promotion to Assistant Supervisor I, and to Miss A. B. Brown on promotion from an allowance post to that of Assistant Supervisor II. We also include in our congratulations Miss H. A. Watt, Clerical Officer, who, like many of her countrymen before her, has seized the opportunity of travelling South on a "single" railway ticket. The opportunity in Miss Watt's case was her appointment on Mar. 1 to an allowance post in the District Manager's Office, St. Albans. That all three officers may live long to enjoy the reward of their past labours is the sincere wish of everyone.

On Sickness and Sick Absence.

"Montaigne, who was great upon doctors, used to beseech his friends that if he felt ill they would let him *get a little stronger* before sending for the doctor. Louis XIV, who, of course, was a slave to his physicians, asked his friend Molèire what he did with his doctor. "Oh, Sire," said he, "when I am ill I send for him. He comes, we have a chat, and enjoy ourselves. He prescribes. I don't take it, and I am cured." (Dr. John Brown). "Esculapius knew that in all well regulated states there was some certain work enjoined everyone in the city which was necessary to be done, and no one allowed to have *the leisure of being sick*, and attentive only to the taking of medicines. This we may pleasantly observe in the case of labouring people, but we do not observe it in the case of the rich, and such as are counted as happy. For instance, a smith, when he falls sick, thinks it fit to take from the physician some potion to throw off his disease quickly, but if one prescribes for him a long regimen, putting caps on his head, and other such things, he quickly tells him that he hath not leisure to lye sick, nor doth it avail him to live in this manner, attentive to his trouble and negligent of his proper work, and so bidding such a physician farewell, he returns to his ordinary diet and, if he recovers his health, he continues to manage his own affairs, but if his body be not able to support, he dies, and is freed from troubles." (Plato).

"It is dainty to be sick if you have leisure and convenience for it." (Emerson.)

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at Jan. 31, 1929, was 1,730,782, representing an increase of 8,199 on the total at the end of the previous month.

The growth for the month is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at Jan. 31	617,570	1,113,212
Net increase for month	3,387	4,812
Residence Rate Subscribers—		
Total	146,643	231,808
Net increase	1,208	1,902
Call Office Stations (including Kiosks)—		
Total	5,536	20,108
Net increase	31	97
Kiosks—		
Total	1,245	4,897
Net increase	31	90
Rural Party Line Stations—		
Total	—	10,377
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	17	1,035
Net increase	—	16

The number of inland trunk calls made during December, 1928, was 8,906,427, bringing the total number for the year up to 107,592,369 ; this figure represents an increase of 7,613,940 or 7.6% on the total for the year ended December, 1927. Outgoing international calls made during December, 1928, numbered 35,325, making the total for the year 421,914, an increase of 101,327, or 31.6% on the previous year's total.

Further progress was made during the month of February with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Pollards, Valentine.

PROVINCES—Aylesbury, Littlehampton, Dringhouses (automatic), Harbury (rural automatic), Haynes (rural automatic),

and among the more important exchanges extended were :—

LONDON—Harrow, Paddington, Primrose Hill, Sutton.

PROVINCES—Birkenhead, Christchurch, Dartford, Derby, Eccles, Petersfield, Whitfield, Ryde, Urmston, Wakefield (automatic).

During the month the following additions to the main underground system were completed and brought into use :—

Epping—Bishops Stortford cable,
Nottingham—Loughborough cable,
Tunbridge Wells—Cranbrook cable,

while 64 new overhead trunk circuits were completed, and 68 additional circuits were provided by means of spare wires in underground cables.

CONTINENTAL HOLIDAYS.

IN addition to conducting the Horsley Party on their annual tour in June, including in this year's itinerary Milan and the Italian Lakes, Mr. J. W. Fewtrell is arranging a party to visit Adelboden, leaving London on August Bank Holiday. Applications for particulars should be addressed to 48, Frewin Road, S.W.18.

THE DRAMA.

The Civil Service Dramatic Society in "The Last of Mrs. Cheyney."

An excellent performance of Mr. Frederick Lonsdale's comedy was given by the Civil Service Dramatic Society on Mar. 11 and 12 at the New Scala Theatre. Miss Joan Crisp (of the Savings Bank Dept.) gave a charming rendering of the title part. Much indeed depends on the plausibility of this enigmatic young woman's character, the all-important pivot on which this witty play turns. That a shopgirl possessed of good looks, charm, and aplomb, can be trained to cut a figure in good society is quite plausible. So also is her desire to escape from her sordid surroundings to luxury by the employment of doubtful expedients. But that a girl with the delicacy of character which Mr. Lonsdale endows Mrs. Cheyney should choose the path of burglary is perplexing. Her 'mor'l number is high" as Mr. Shaw's Hector would put it, if we accept the truly Anglo-American superstition that morality is only a matter of sex. Given, however, that his heroine could be persuaded into her course of action by a "crook" of great charm of manner and a public school and Oxford training—and the author is, of course, entitled to allow her this foible—the character of Mrs. Cheyney is otherwise consistent enough, and the comedy with its dramatic surprises and brilliant dialogue is worked out to an equally dramatic and surprising end. Mr. Hewetson took the part of the crook with great naturalness and persuasiveness. Indeed, naturalness was the prevailing note of a capital caste. Mr. Blake Greenwood as Lord Dilling well sustained a part requiring a considerable range of technique, and was particularly excellent in all his scenes with Mrs. Cheyney. Mr. Galpin as Lord Elton was appropriately pompous and fatuous, and Mr. Wall filled the comic rôle of the Hon. Willie Wynton with gusto. One of the best and most distinctive impersonations in the play was Miss Chandler's Lady Frinton, which caught exactly the right note. Miss Madge Harwood (of the Controller's Office, L.T.S.) was very good as Mrs. Ebley, and of the minor parts Miss Woodger's Joan stood out.

The G.P.O. Players in "Jugged Heirs."

Mr. Hodgson-Bentley's comedy of village life had a very good reception on its performance at the Guildhall School of Music on Mar. 15 last. It appeared to derive from the village comedies with which Mr. Eden Philpotts has familiarised us, and contained one of those family will-reading scenes in which the greedy heirs are suitably disappointed. Judd Beacham's device for testing the disinterestedness of his family was certainly ingenious and novel, but we thought the appearance on the scene of the missing soldier (the heroine's blinded father) punctually as his name was read out, savoured of theatricality. Apart from this, the play was skilfully developed, possessed some good character drawing, and was thoroughly enjoyable. Mr. John Cahill was in great form as Judd Beacham, and Miss Minnie Law as Anne was very natural and charming. Mr. Bernard Harewood as a young lover was quite successful in all his scenes with Anne, but Mr. Gerald Storr, very good in a part of somewhat unrelieved self-seeking and domineering, was inclined to be melodramatic at times. Mr. Wilfrid Sellars in the sympathetic part of Jim Cripps was delightful throughout. Excellent light comedy was provided by Mr. Eric Hudson as Simon Crakes and by Mr. Cyril Leigh as a schoolboy of ghoulish proclivities. Beacham's two daughters were played by Miss Dorothy Smith and Miss Margaret Henneker with the proper degree of waspishness. Finally, Mr. Jack Scott as "a soldier" made the most of his dramatic episodes and handled very satisfactorily the difficult rôle of a somewhat tragical figure moving in a realm of broad comedy. Both in the individual acting and in the ensembles the G.P.O. players lived well up to their high reputation. Mr. Hodgson Bentley, as we have said, had a hearty reception at the fall of the curtain.

W. H. G.

Maintaining Strowger Automatic Supremacy—

Progressive Wiring of Switches

In the progressive wiring line shown here, girl operators are used because of the nimbleness of their fingers and the greater deftness and expertness with which they master the wiring operations. This department is located in a corner of the building, with a continuous row of windows on two sides affording ideal conditions of light and ventilation.

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[This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.]

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STROWGER AUTOMATIC

The
Telegraph and Telephone Journal.

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Editing and Organising Committee - - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

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CORRESPONDENTS, CANDLESTICKS, AND TROMBONES.

PROBABLY no section of a modern newspaper—not even the Gossip columns furnished by those ingenious spirits who claim to have access to boudoirs, clubs, coteries, and the dark secrets of cabinet ministers—contains such an unrelated mixture of fact and fancy, sense and nonsense as the correspondence column. Letters from the scholar, the well informed and the expert; letters from the ill informed and the painfully inexpert; letters airing grievances, real or fancied; letters captious and facetious; letters suggesting reforms and improvements; and letters from those strange creatures who write to thank the editor for his public spirit in providing some feature of which they approve: all afford in turn instruction or amusement. Possibly 'good' editors sometimes publish bad letters with the design of exciting a lively controversy and drawing good corrective copy from well-informed writers. More probably they take their correspondents' information for what it is worth and leave it to interested parties to correct it. For instance, a correspondent's erroneous recollection of what the telephone rates were in a given foreign country would obtain as good, or better, publicity than an official document on the subject giving the correct rates. The interested party, the administration whose rates are attacked by implication, may sometimes reply; but the task of correction is a Sisyphian one, for the false information has in the meantime been copied perhaps by other papers.

The correspondence column is undeniably a very proper channel for redress of grievances. People fly naturally to the Press for help when they imagine they have failed to obtain it by more direct means, and who shall blame them? But many take the more dramatic, if less just, course of airing their grievances in public, before they have given the supposed offending authority the opportunity of furnishing its explanation.

A novel but increasing species of correspondent is the man who writes to tell us that which cannot possibly interest anybody but himself. A writer, for example, to the *Daily Mirror* last month says: "I have removed the telephone from my house. I could no longer endure its persecution." If a man gives up his railway season ticket because the train service is abominable and the omnibus is quicker, he may possibly do his fellow citizens a service by ventilating the fact. But if he gives it up merely because railway travelling is distasteful or distressing to him, surely his action interests no one but himself.

As regards the promotion of reform, it is interesting to record that amongst the various telephone reforms pressed on the notice of telephone authorities by correspondents from time to time, the form of the subscribers' instrument is an old one. When the present standard form of telephone was prevalent in America, the hand-combination set then chiefly in use in Europe (including this country) was jeered at as a "slide-trombone." Exhaustive tests, practice and experience demonstrated the superiority of the "candlestick" instrument, as it is now often contemptuously called, and it became the standard instrument in this country also. Of late there has been a mild newspaper agitation for the reintroduction of the "one-handed" pattern. Mr. Compton Mackenzie, the novelist, writes to the *Morning Post*: "Anyway, something will have to be done about the size and weight of receivers, for every time I visit London I notice with dismay the increasing resemblance of my friends to anxious esurient giraffes." Mr. Mackenzie will no doubt be interested to hear that the Post Office has placed an order for a large number of hand-combination instruments of improved pattern. We hope, therefore, that he may soon find some of his friends no longer resembling anxious, esurient, dumb creatures, but, rather, the talkative animals of Æsop.

It is better, perhaps, if we have ideas for the advancement of humanity, to give them vent in correspondence columns than to keep them cloistered and unproductive in the brain. We only suggest that all ideas thus put forth are not equally novel or even beneficent.

HIC ET UBIQUE.

THE American Telephone and Telegraph Company's report for 1928 shows the following progress:—

Number of Telephones—	1928.	Increase.
"Bell" Companies ...	14,524,648	798,592
Companies having connection with the Bell Co.s ...	4,672,387	32,957
Total ...	19,197,035	831,549
No. of Exchanges	6,224	109
Miles of exchange wire ...	53,415,692	4,136,313
Miles of Toll (Trunk) wire ...	8,777,052	1,233,536

The Postmaster-General speaking at Alderley Edge last month in reference to Mr. Lloyd George's proposals for telephone development, pointed out that although the net increase in telephones in this country, did not exceed 125,000 (a record) last year, the gross increase was 140,000. This country showed a higher percentage of development during the last 5 years than any of the chief telephone-using countries, as the following figures witness :—

	Percentage Increases.		Percentage Increases.
Australia ...	71	Canada	33
United Kingdom	56	United States ...	29
New Zealand ...	46	Denmark ...	21
Germany	36	Sweden	19
Switzerland ...	34	Norway	8

The *Staffordshire Sentinel* contains the following tribute to the Telephone Service :—

Desiring to get into touch with an old friend in a small town, just beyond the Staffordshire border, I dialled "O" and explained. I knew neither the name nor telephone number of the office in which my friend was engaged. I was given a call to "Inquiries" at the town in question, and without a minute's delay I was put into communication with my friend. The town is small, and my friend well-known there, and it is not the difficulty of finding him that seems worthy of recording, but the fact that the task was undertaken so willingly.

A London suburban paper recently issued the following correction :—

In an article published in our last issue and headed "Fifty-fifty 'Phone Chance," it was stated that the percentage of calls completed on the first application were from 37.8% (in 1927) to 40.2% (in 1928). The figures should have been, respectively, 82.9 and 82.4, which, of course, is a very much better average.

Truly, a trifling error! The wrong number joke scarcely appears to be against the Post Office here.

FORTY YEARS IN THE TELEPHONE SERVICE.

A SPLENDID record of a life spent in the Telephone Service stands to the credit of Mr. Richard Bryson, who has just retired, and there can be few men who have been more closely associated with the growth and development of the administrative work in the London area.

Mr. Bryson entered the service of the Northern District Telephone Company on Feb. 21, 1889, at the age of 21. His early years were spent in the North of England, Sunderland at first, under Mr. C. B. Clay as General Manager of the Northern District Telephone Company, until that company was taken over by the National Telephone Company. In 1896 he was appointed Chief Clerk at Newcastle, and in 1899 came to London as Chief Clerk of the Western District, then under the managership of the late Mr. R. A. Dalzell, C.B.E. When the National Telephone Company's London Districts were amalgamated in 1905 Mr. Bryson was appointed Chief Clerk of the Rentals Department. In 1910 he was appointed to the control of the clerical staff employed at Headquarters taking the inventory of the company's plant.

After the transfer of the Company's business to the Post Office Mr. Bryson was in charge of a section of the accounting work in the London Telephone Service. He was the senior Higher Executive Officer and was frequently called upon to deputise for the Superintendent of his Division.

That Mr. Bryson was popular with all ranks of the staff was amply demonstrated at Cornwall House on the evening of Feb. 28 when, in the presence of a large gathering, he was presented with a silver tea service and salver. In asking Mr. Bryson's acceptance of the gift, Mr Valentine, the Controller of the London Telephone Service, fittingly expressed the affection and esteem in which he was held by all those with whom his official duties had brought him into contact and hoped that he would live for many years to enjoy a well-earned retirement. In thanking Mr. Valentine, Mr. Bryson said that at such a time words were inadequate to express his feelings. He had always endeavoured to do his duty to his employer and the staff, and although retiring from daily contact with his colleagues, he hoped to have many opportunities to meet them in the future.

On Monday, Feb. 25, Mr. Bryson (with whom were Mrs. and Miss Bryson) was entertained by his own immediate staff at a little farewell dinner held at Carr's Restaurant, in the Strand. Mr. J. B. de Lyon presided, and in handing to Mr. Bryson an autograph album containing the signatures and sentiments of his colleagues, assured him that he was carrying into his retirement a love and affection which were more precious than all the gold in the world. The humour of the musical programme, arranged by Mr. Reimann, kept the company in happy mood, and any sadness which might have been felt at the parting with an old and valued colleague was dispelled in hearty laughter. The evening will be long remembered by all who were present.

THE AMERICAN TELEGRAPH SYSTEMS.*

BY G. T. ARCHIBALD.

MOST of those present to-night are probably aware that this paper is the outcome of a recent visit to America, and I should like at the outset to express my indebtedness to the gentlemen with whom I made the trip —Mr. Simon, Mr. Stuart Jones, Lt.-Col. Lee and Mr. Stone—for some of the data which I shall present to you.

We are to deal with the telegraph systems covering a vast continent, where large towns are separated by thousands of miles, as compared with a hundred miles and less in this country, where small communities are separated by very long distances, and where railroad and postal communications are not nearly so frequent as those at home. I mention these points at this stage because they are important in any consideration of the relative positions, from a telegraph point of view of this country and the United States of America.

In America, as you are probably aware, the telegraph and telephone services are conducted by private companies. The telegraph business is controlled by two public corporations, the Western Union Telegraph Company and the Postal Telegraph-Cable Company, and the telephone service by one public corporation the American Telephone & Telegraph Company.

Public control over the activities of the telegraph and telephone companies is vested in the State Public Service Commissions of the various States and by a body called the Inter-State Commerce Commission. Questions affecting a single State are dealt with by the State Commission; those affecting two or more States are dealt with by the Inter-State Commerce Commission. These Commissions are responsible, amongst other things, for seeing that telegraph and telephone charges are reasonable and that adequate public facilities are provided. Any town or village community may appeal to the State Commission for new or better facilities, and the companies must face the music if they are not prepared to grant such requests.

A tremendous amount of work is thrown upon the companies by these Commissions. The Western Union Company is, I believe, subject to the jurisdiction of 43 Public Service Commissions and 23 Workmen's Compensation or Industrial Commissions. It is required to furnish about 18,000 statements every year, including 3,100 annual reports to taxation authorities, and as taxation is on State lines it is required to show its financial position separately as regards each State.

Before describing the telegraph systems I think it may be worth while to trace the origin and development of the two companies.

The invention of the recording telegraph by Professor Morse in 1832 was responsible for the creation of a large number of short telegraph lines throughout the country, and in 1851 over fifty separate companies, licensed to use Morse patents, were operating in the United States. Other telegraph signalling devices, mostly infringements of the Morse patents, were also in operation. The most important alternative system appears to have been the House printing telegraph, which printed in plain Roman characters instead of dots and dashes. Lines operating this system were in use between New York and Boston and New York and Philadelphia prior to 1850, but about that time a group of Rochester citizens obtained the right to operate it, and in 1851 a company, called the New York and Mississippi Valley Printing Telegraph Company (afterwards the Western Union Telegraph Company), was incorporated under the laws of the State of New York. The company's original intention was to construct a telegraph line from Buffalo to St. Louis, via Louisville. This project had to be abandoned, however, and a line was constructed to Chicago in 1855.

The proposed capital of the company was $360,000, and although special concessions were offered in order to attract the investing public, not more than $170,000 was subscribed.

In the meantime, two rival systems, consisting of 13 different companies, were operating in the five States north of the Ohio River, waging a three-cornered fight with each other and with the New York and Mississippi Valley Company. The service was unreliable, and the financial condition of the Morse companies led them to approach their rival with offers of sale and consolidation. Satisfactory terms were arranged, and following the elimination of duplication and wasteful competition the new company made great strides. In April, 1856, its name was changed by Act of the New York State Legislature to Western Union Telegraph Company, and in December, 1857, the Company paid its first dividend.

During the next four years the business was extended to cover the States of New York and Pennsylvania, the Atlantic and Gulf States, a few Middle West States, the Southern Mississippi Valley and the South-West. In 1861, following an urgent demand for quicker communication with the Pacific Coast, Congress voted an appropriation of $40,000 a year for 10 years, under certain conditions, for the building of a telegraph line east and west. A convention of telegraph companies called in 1860 voted the Act objectionable on account of its restrictions, but the Western Union Telegraph Company took a different view and, acting independently, undertook to build the line, which was completed in 1861. In 15 years the company increased its wire mileage from 550 miles to 75,000 miles.

* Paper read before the London Telephone and Telegraph Society.

In 1911 the business was purchased by the American Telephone and Telegraph Company, but the combination was declared to be a breach of the Anti-Trust Laws and dissolved. The company, now incorporated under Federal laws, has its headquarters in New York, sharing with the American Telephone and Telegraph Company the occupation of 195, Broadway. There is now in process of erection a magnificent new building which it is hoped to complete in 1930. The new premises are estimated to cost $13,000,000. The building will be 400 feet in height, contain 24 floors and house the whole of the headquarters staff and the New York Main Telegraph Office and the Cable Office.

The company has contracts with all railway companies both for wayleaves and telegraph facilities, so that with its own offices and those of the railway companies it now serves about 25,000 places in the United States. In addition, and by agreement with the various interests involved, the company has connexion with all telegraph offices in Canada and Mexico.

Control of the company is vested in a board of 21 directors to whom the president, or general manager—who is himself a director—is responsible for management. The president, Mr. Newcomb Carlton, was at one time associated with the British Westinghouse Company, both in Manchester and in London. He is assisted by five vice-presidents, in charge of the *commercial, traffic, plant, engineering and accounting departments* respectively, and a general solicitor.

The senior vice-president is in charge of the commercial department. He is responsible for all public relations, development of business, collection and delivery of telegrams, provision of facilities at all offices, and for the staffing of instrument rooms, maintenance of apparatus, &c, at all offices other than those under the control of the vice-president traffic department.

The vice-president of the traffic department is responsible for the disposal of telegrams at what are called functional offices, i.e., offices at which the operating room requires separate supervision, for the maintenance of apparatus and for the economical working of those offices.

The *vice-president of the plant department is responsible for the* construction and maintenance of lines, tubes, carriers, power plant, &c., and for the supply and installation of internal apparatus, but not for its maintenance.

The vice-president of the engineering department is responsible for all research work relating to internal and external plant, for the testing of new types of apparatus and for the study of new methods.

The vice-president of the accounting department is responsible for the proper accounting, checking and auditing of the company's funds.

The general solicitor is responsible for such legal work as may be necessary.

Each vice-president is accountable directly to the president of the company for the work of his department. There is, necessarily, close co-operation between the various departments, but where the interests of two or more conflict the vice-presidents attempt to arrive at some measure of agreement. In the last resort the decision of the president, to whom all such differences must be referred, is final.

For the purpose of local control the territory served by the company is divided into eight districts, in all of which the various departments, except the engineering and law departments, are represented; the commercial department by a general manager, the traffic department by a division traffic superintendent, the plant department by a division plant superintendent and the accounting department by a division auditor. Each of these officers maintains a separate and district organisation and is directly responsible to the vice-president concerned.

The operating procedure laid down by the traffic department is common to all offices, whether functional or non-functional.

The story of the Postal Telegraph-Cable Company is not without interest, for it is closely identified with the story of John W. Mackay. Mackay, after amassing great wealth in gold and silver mining, sighed for other worlds to conquer, and in 1883 James Gordon Bennett, owner of the *New York Herald*, very dissatisfied with the poor cable and telegraphic service, was successful in obtaining Mackay's interest.

In 1881 the Western Union Telegraph Company, under Jay Gould, had acquired control of most of the commercial telegraph lines in the United States. A number of small companies carried on for a few years, including the original "postal" companies. The Western Union Company had secured the best routes for land lines; new rights of way were difficult to obtain and were generally very expensive, there was in operation a system of reduced rates and rebates which could not be given by any small company without considerable loss and the telephone was beginning to develop as a medium of more than local communication.

It would seem that the telegraph service in America was not at that time very efficient. Mackay threw his energy and wealth into the fight for a better telegraph service. After making a careful study of communication he decided to attack the Gould combination on both cable and land lines, and in 1884 his cable company—the Commercial—commenced operations. He reduced the rate between the United States and London from 40 cents to 25 cents per word. A rate war ensued, but the older company could make no impression on its rival and the war was discontinued.

After completing his cable scheme Mackay turned his attention to the land line system, and decided after examining the possibilities of the few remaining independent companies to use the Postal Telegraph Company as the nucleus of his land line system. The origin of the name of the company is interesting. In 1870, probably as the result of the purchase by the State of the telegraph companies in this country, there was considerable agitation for State control of the American telegraph service, and it is popularly believed by American telegraph officials that the name Postal Telegraph was adopted in order to obtain favour from those who desired Government control of the telegraph business.

Mackay's new company, known as the Postal Telegraph-Cable Company, was incorporated in 1886. He gathered under his wing a number of the *impoverished independent companies, consolidated their facilities* and personnel, standardised operations and placed them on a more efficient basis. Concurrently he set about the task of increasing the ramifications of the company. He entered into working agreement with the Canadian Pacific Railway Company which gave him access to the Far West, and gradually the system was extended until, at the present time, thanks to the energies of Mr. Clarence Mackay and his assistants, the company has 300,000 miles of land line and serves 2,300 offices in the United States. It has connecting links with 1,520 offices in Canada and can reach 35,000 places in America by telephone. It competes with the Western Union Telegraph Company only in those places where both services can be maintained without loss.

A few months ago control of the Postal Telegraph-Cable Company passed into the hands of the International Telephone and Telegraph Company, and the business is now in process of reorganisation under the management of Colonel A. H. Griswold, executive vice-president.

Finance.—In 1927 the Western Union receipts amounted to $131,771,003, operating costs reached $115,846,032, pensions, sick and annual leave, and death benefits totalled $3,700,000, and $1,080,624 were distributed under the Income Participation Scheme, about which I shall have something to say later on. The Company employed 62,820 persons during the year, of whom 14,220 were messengers.

The average toll per telegram was 68.38 cents; the average number of chargeable words per telegram was 13.45 and the average number of free words including preamble was 15.14. The total number of telegrams and day-and-night letters handled was about 172,000,000 and 3,840,544 telegraph money orders, or transfers as they are called in America. The amount of money transferred by wire amounted to the stupendous sum of $236,532,679.

During the same period the revenue of the Postal Telegraph Company amounted to $26,730,523 against an operating expenditure of $22,691,232. Payments on account of sickness and death benefits reached $106,048. There was no charge for annual leave, a point which will be referred to later. The company employed 15,695 persons, of whom 4,750 were messengers.

The average number of paid words in day-rate telegrams was 15 words and 14 words including preamble were transmitted free of charge. The company handled 35,593,000 messages, 65% of which were fully paid day telegrams and 250,646 telegraph money orders, transferring $18,522,154.

Tariffs.—Under an Act of Congress telegraph companies carrying on an inter-State business are declared to be common carriers. As such they are prohibited from discriminating in rates of service and are liable to a penalty of not less than one hundred dollars, and not more than 2,000 dollars, for directly or indirectly giving free service of any kind to persons other than those specifically enumerated in the Act.

The rates charged by the two companies are the same except that the Western Union Company continues to charge an addition of 20% on intra-State as distinct from inter-State traffic, which was imposed on all domestic or inland telegrams during the war.

The unit of charge is 10 words, the address and signature being transmitted free of charge. Abbreviated addresses are not used in the United States inland service. There are three rates:—

(1) The urban rate of 24 cents for 10 words which applies only to telegrams within the same town or city.

(2) A rate described as the "square rate." The country is divided into 50-mile squares and the rate is calculated according to the distance between the square of the office of origin and that of the office of destination. Square rates are not applied to telegrams for places separated by more than four squares from the office of origin. The State rate applies beyond that limit as well as in cases within that limit, where it is lower than the square rate. A rate-sheet combined with a tariff book enables the counter clerk and accounting staff to ascertain the correct tariff without loss of time. There are three groups of square rates—30, 36, and 48 cents for 10 words, less 20% in the case of the Postal Telegraph Company.

(3) The State or long-distance rate which is fixed according to States, which are grouped in zones. In New Jersey, for example, there are five zones and the rates are 48, 60, 72, 90, and 120 cents respectively for 10 words.

Lower rates are charged for night telegrams, the charge for long-distance night telegrams being 55% lower than that for day telegrams.

Government telegrams are charged at 40% of the ordinary tariff and the companies lose money on these transactions.

A day letter of 50 words costs one and a half times the ordinary rate for 10 words: a night letter of 50 words is charged at the ordinary day rate for 10 words. Press messages are charged at one-third of the ordinary rate during the day period and one-sixth of that rate during the night period.

Traffic.—There are four principal classes of traffic, day telegrams and night telegrams, and day letters and night letters. Under the Western Union Company's system 70% of the traffic is day telegrams, 5.5% night telegrams, 8.5% day letters, and 16% night letters. The night letter traffic is being affected by an air mail service which the Post Office has recently inaugurated.

"Greetings" Telegrams.—Both companies cater for "greetings" telegrams, charged for at the ordinary rate. The messages are typed on specially designed forms and enclosed in distinctive envelopes.

An analysis recently completed by the statistical department of the Western Union Telegraph Company reveals a stupendous increase in the number of telegrams dispatched annually as greetings. Growing from a comparatively small number at Christmas and New Year's, the custom of sending greetings over the wire has now spread until it includes Valentine's Day, Easter, Mother's Day, Father's Day, and Thanksgiving. The volume of greetings over the Western Union wires increased approximately 65% in 1927 over 1926, and it was estimated that this year more than 200,000 greetings messages would be handled by the company during the Christmas holidays.

Total Traffic.—About 204,000,000 telegrams and day and night letters are dealt with annually by the companies. The Western Union Company obtains about 82% of the total, but it has to be remembered that, at present, it has practically a monopoly in regard to small office traffic.

Competition.—There is keen competition between the two companies for traffic of all kinds. Both are prepared to install on the premises of a customer who originates above five dollars-worth of business monthly a call box or pick-up signalling apparatus, which is connected to the delivery room of the nearest office. As many as 120 customers may be accommodated on a single circuit—the average is about 80—and each is allotted a numerical signal which he taps out on a push button or key. The signal is sent twice in order to reduce the risk of error, and is received at the delivery office both on a bell and on a tape machine. The clerk in charge, who is provided with a card index containing the name and address of each caller, records these particulars on a docket and passes it to the first waiting messenger.

About 258,000 of these calling machines have been installed by the Western Union Company and 184,000 by the Postal Telegraph Company, of which 49,000 and 40,000 respectively are in New York. In large numbers of cases both companies install the apparatus in the same premises. Both are called at the same time, when it is known that the traffic of destination can be reached by both systems, with the result that the boy who arrives first gets the message. That is why Western Union forms are seen so frequently in Postal Telegraph Offices and *vice versa*. Collection is given priority over delivery.

About 80% of the total traffic is picked up by messengers.

The companies also provide, free of charge, private wire facilities telephone, morse, or teleprinter between the premises of large users and their transmitting offices.

In London we are accustomed to the sight of a Lyons tea shop and an A.B.C. tea shop in close proximity to each other. In America, if you are interested in telegraph business you look for a Western Union Branch Office whenever you see a Postal Telegraph Branch Office. These branch offices seem to be scattered about with great prodigality. In the windows are displayed pieces of new and old apparatus and attractive posters. Inside everything is done to make the sending of a telegram as easy as possible. Comfortable chairs and neat writing tables with forms of all kinds and decent pens and pencils in plenty are provided; at some of the larger offices a typewriter is at the disposal of customers.

The counter clerks are carefully trained, and I have little doubt that they sometimes persuade people to send telegrams which they would otherwise leave unsent. The story is told of a fond young father who wanted to advise his mother-in-law that she had become a grandmother. The counter clerk with an eye to business asked if this was the firstborn. The reply being in the affirmative he proceeded to suggest that other members of both families might be interested, and was rewarded by another eight telegrams.

Canvassers are employed by both companies. If a customer fails to reply to a telegram which obviously requires a reply, a canvasser calls next day and points out that a reply has not been sent. Sometimes he finds that the boy from the rival company got there first.

A branch office is usually to be found in large hotels and in some cases both companies are represented. As a general rule the offices are side by side, divided by a thin partition. The hotel companies stipulate that the offices shall remain open until a late hour and that attractive young ladies—up to the hotel standard—are employed as counter clerks. I did not learn whether the companies hold beauty competitions, but I can testify to the taste of the officers responsible for the choice of hotel telegraphists.

The Postal Telegraph Company is at a serious disadvantage as compared with its rival. Large numbers of young people from country districts obtain employment in the big towns with no knowledge of any telegraph system other than that operated at the railroad station of their home towns—the Western Union. Naturally, when called upon to send a telegram they think first of the Western Union. To combat this the Postal Telegraph people are considering the possibility of persuading commercial colleagues to use Postal Telegraph forms in their training schemes.

Counter Acceptance.—It is worthy of note that the sender of a telegram may request the company to collect the cost from the addressee, that practically 90% of the traffic is accepted without prepayment, and that there is no charge for account keeping.

Relations with Staff.—Both companies are firmly opposed to trade unionism amongst their employees. They take the line that the telegraph service is a public utility and as such should not be influenced by the trade union movement. The Postal Telegraph-Cable Company, on the one hand, requires every applicant for employment to sign a declaration that he or she is not a member of any trade union and will not become a member of any similar organisation, hostile to the company, while in its employ.

The Western Union Company, on the other hand, has encouraged the formation of an association amongst its employees. Supervising and operating grades are included in the association but the former apparently take no part in its activities. Local and divisional committees elected by the members negotiate with the company's local officials, whilst its central committee negotiates with vice-presidents, &c. No member of the central committee may be dismissed without the consent of the president of the company.

An annual conference between the vice-presidents and the principal officers of the association is held at the head office for the discussion of various questions relating mainly to pay and conditions of service. In cases of disagreement the association has access to the president, who does not usually attend the conference.

Recruitment.—An employment bureau is maintained by the Western Union Company at every large office. Candidates are interviewed and full enquiry is made into the antecedents of those who appear to be suitable for employment.

Before a boy or a girl is engaged an officer of the company visits the candidate's parents and satisfies himself that the home environment is up to the standard required by the company.

Boys and girls who have reached a moderate educational standard are employed as messengers and routing aides (collectors and distributors), and these may in the course of time become routing clerks (circulators), clerks, or tube attendants, their promotions depending largely upon their education and ability.

The company's officers consider that a fairly high educational standard is necessary for operating classes and, as a rule, girls and boys leaving school at 18 years of age are preferred. No educational examination is imposed, but every boy and girl candidate for employment as a clerk or telegraphist is required to pass certain intelligence tests and in the case of phonogram operators and keyboard operators digital and auditory tests. The digital tests is interesting. It is designed to test control of the fingers and those co-ordinations of hand, eye and mind essential to efficient keyboard operation by the touch method. Some means of selecting for that work those possessing natural finger dexterity, ability to sustain vision on copy, and the mental alertness required for rapid and accurate transmission is essential in modern telegraph operation, and an instrument known as the digitometer has been designed to meet that need. A metronome is placed in circuit with the instrument and the figures appearing on the disc change with each beat. The metronome is started at 30 dial changes per minute, increasing by 5 until a maximum of 50 is reached. The candidate is required to type the figures as they appear on the disc. The results are recorded and checked. No candidate who fails to pass this test is considered suitable.

It is recognised, too, that ability to read script and detect errors in messages is also important and specific tests are given.

It is claimed by the company's officers that the tests enable them to select the best-fitted candidates, that only in a very small number of cases has the subsequent performance of the learners failed to justify their selection and that they have been a factor in the improved performance of operators.

At one time all new entrants were paid at the rate of $60 per month on entering the telegraph school. Many learners resigned after qualifying in touch typing in order to accept better positions as typists, &c., elsewhere, and it is now the practice to make no payment during the first three months' service, except in those cases where learners have to leave their homes for instruction. This arrangement has greatly reduced the number of resignations but has had the effect of reducing by about four weeks the time occupied in training. It has also had the surprising effect of attracting a more suitable type of employee.

Owing to the great development in recent years of type keyboard operating training in morse telegraphy has ceased. Fully-trained morse operators are now difficult to obtain and the question of training a limited number of sounder operators is under consideration.

Applications from fully qualified operators for employment as telegraphists are considered at all times and suitable men and women are engaged at the rate of pay appropriate to their qualifications.

Clerical Staff.—The minimum age for employment on clerical work is 17. Applicants with high-school qualifications are preferred, but promising candidates of good appearance and address with only the highest grade elementary school qualifications are sometimes accepted. Clerical appointments are also given to routing aides who appear to be suitable for the work.

(To be continued.)

COMMISSION CONTROL OF PUBLIC UTILITY SERVICES.*

BY A. J. WALDEGRAVE, ESQ., M.B.E.

(*Continued from page* 115.)

AN idea of the kind of cases which come before the Commissions and the kind of treatment which they receive will perhaps best be gained by looking at a few actual telephone cases. But first let it be remembered that telephones are only one of the classes of public utilities with which the Commissions deal. In the State of Indiana, for example (for which I happen to have the figures), there are 1,376 different public utility companies coming under the jurisdiction of the State Commission. These comprise, besides telephone utilities, steam railroads, electric railroads, water, heat, gas and electric utilities and bus companies. I ought, perhaps, to point out that, generally speaking, local undertakings, as well as those operating in wider areas, come under the jurisdiction of the State Commission and are not subject to the control of the city authority: indeed, a case coming before a Commission usually consists in a dispute between the city or other local authority and the Company. But to go into the reasons for this would take us too far into the subject of American local government.

Let us now try to gain an idea of the actual functioning of the Commissions from a few typical telephone cases as briefly reported for the information of those engaged in the telephone industry. These reports I have taken from *Telephony*, the weekly organ of the independent telephone companies, that is, the companies outside the Bell organisation, otherwise known as the American Telephone & Telegraph Company. A monthly summary of the proceedings of the Commissions in telephone cases is, I might mention, issued by the A.T. & T. Co., and it runs to two or three hundred pages.

Here is a case of rate increase:—

"The Oklahoma Corporation Commission recently granted the application of the Oklahoma Telephone Company for an increase of telephone rates at Broken Arrow, which become effective after an automatic exchange is installed. Old and new rates of the company (monthly flat rates) are:—

	Old.	*New.*
	$	$
Business, individual line ...	3.00	4.25
Business, two-party	2.50	3.75
Business, extension line ...	1.00	1.00
Residence, individual	1.75	2.50
Residence, two-party	1.50	2.00
Residence, four-party	—	1.75
Residence, extension	.75	.75

"The application for an increase was supported by petitions filed by 70% of the subscribers in Broken Arrow, also by petitions from the city council. Citizens agreed to pay the higher rates when an automatic exchange is installed by the Oklahoma Telephone Co."

Here is a case of appeal from a refusal of a Commission to allow an increase of rates:—

"Officials of the Southern Indiana Telephone & Telegraph Co., which was denied a rate increase for service at Bicknell, just before Christmas, have informed the Indiana Public Service Commission that they will appeal from the decision to the Jackson circuit court. A transcript of the evidence in the case will be filed with the circuit court, which, under the utility statutes, has jurisdiction as a court of appeal.

"Notice of the appeal alleged that the public service commission ruling was 'arbitrary, capricious and unreasonable.'

"In making the ruling the Commission stated that the utility should not receive a rate increase because all other business in Bicknell is in a bad condition and the company should be willing to be regulated by general conditions. The conditions arise from the fact that the coal mines are not working, leaving many unemployed."

Here is another case of appeal from the order of a Commission, but on a much bigger scale:—

"Voluminous briefs, covering every aspect of the telephone rate litigation in progress in the federal courts for the past four years, were filed last week by the New York Telephone Co., the New York Public Service Commission, the city of New York and the Attorney-General. Special Master Isaac R. Oeland, who was named by a federal statutory court four years ago to hear testimony on the company's charge that public service commission rates established in 1923 were confiscatory, heard oral arguments this week.

"The company, whose New York State rates are involved in the litigation, began its federal suit on April 25, 1924. Hearings before Mr. Oeland started Oct. 14, 1924, and continued until Sept. 10, 1928. There were 710 separate hearings, in the course of which 3,288 exhibits were put in evidence and 36,532 pages of testimony recorded. . . .

"The New York Telephone Co., shortly after beginning its suit in 1924, obtained from the federal court an order permitting it to make a surcharge of 10% over the rates established by the Commission in 1923. In May, 1926, the Commission, after further hearings, allowed the company to retain this surcharge and to make additional rate raises which increased the company's revenue about $9,111,378 a year. The company, dissatisfied with the additional increase, insisted that it was entitled to a return of 8% on its investment, requiring an annual increase of $13,601,555. . . .

"The joint brief of the Commission and the Attorney-General attacks the company's bases for computing valuation and return on its property and asserts that to sustain them would make available for holders of the company's common stock a dividend of 21%. . . .

"The company's brief declares that the value of its entire telephone property in the State on July 1, 1928, was at least $749,947,119. In their briefs the Commission, the Attorney-General, and the city oppose the company's contention that 'going value' be included in the rate base. This item was excluded by the Commission in granting the rate increases of 1928."

If the Commissions sometimes deal with cases involving enormous sums and important issues they at other times have to bend their minds to smaller matters. For example, the Nebraska Commission had recently to deal with an application from a Mr. A. J. Haines, a subscriber of the Curtis Telephone Co., who asked for an order to have his telephone connected again.

He said that it was cut off because he protested against the long waits for connexions and because his complaints against the sauciness of the central operator turned out to be complaints against the manager's wife. The report proceeds: "Mr. Haines insists that, as a matter of fact, the manager's wife *is* saucy to patrons, and he is not the only one who doesn't like the situation."

It is difficult without occupying an undue amount of time to give a summary of enough cases to convey an adequate impression of the variety and magnitude of the operations of the Commissions. Perhaps it will help if a few headlines with the descriptive touch which the American journalist gives to them are quoted. Here are the headlines to the cases which receive special mention in one recent issue of *Telephony*: "Radio Monopoly Charge Dismissed by Federal Commission"; "Extension of Chicago Franchise of Illinois Bell Company"; "Injunction Suit against Indiana Commission Order Dismissed"; "Appeals from Indiana Commission Order Authorising Competition"; "Commission Refuses to Abolish 'Free' Exchange Service"; "Asks Connecting Lines to Move Because of Induction"; "Kansas Farmer Line Objects to Telephone Pole Rental"; "City Attorney of Louisville, Ky., Believes Increase Justified"; "Michigan Commission Gives Approval of Consolidation"; "Rate Application Shows Property Depreciation at Bloomfield, Neb."; "Ohio Central Company Collects Increased Rates under Bond"; "Changes Recommended in Nebraska Compensation Law"; "Portland, Oregon, Seeks to Force Bill to Accept Franchise"; and, lastly, "Pacific Company Submits New Franchise to Settle Dispute."

A word as to the cost of the activities of the Commissions, the extent of which I have thus tried to indicate. (Again let me remind you that telephone cases constitute only a section of their work.) The total cost of the Commissions is in the neighbourhood of $12,000,000 per annum, say, £2,500,000, and this does not include the expenses of the companies or of city authorities and others concerned in the cases. It is a large sum, but after all it amounts only to £1 per £1,000 of the revenue collected by the public utilities of America; and it does not seem improbable that the community would find the cost of the public utility services increased by more than £1 in a thousand if the safeguards against the exactions of monopoly and the wastefulness of competition in such services were withdrawn.

Approximately one-half of the total cost of the system is in respect of the federal Commission known as the Interstate Commerce Commission, with its headquarters at Washington, about which I have not so far said anything except by casual reference, but which is an important feature of the system.

As we have seen, the separate States of the Union have independent jurisdiction over undertakings operating within their own territory and neither the central Government nor any other individual State has power to interfere in the relations between a company and the State within which it operates. It is interesting to note, though it breaks the thread of our story, that this self-contained nature of the relations between a State and the companies operating within it gave birth to an institution of the financial world which in recent years has undergone great developments quite outside the circumstances in which it had its immediate origin. I refer to the "holding company." This device was invented to enable financiers in one State, say New York, to control companies in other States.

The American Telephone & Telegraph Co. is a holding company of this kind so far as local services are concerned; it holds the majority of the shares in operating telephone companies in most of the States but it has no legal standing in those States.

When, however, we come to services like the trunk telephones ("tolls," as they call them in America) and, more important, the trunk railway system, we transcend the boundaries of the separate States and find ourselves in the federal region and encounter the organisation set up by the United States Government itself to control in the general interest the public utilities of an inter-State character.

The Interstate Commerce Commission was set up in 1887. In 1906 its powers were greatly strengthened and in 1920 the Transportation Act consolidated and further enlarged its powers. There are eleven Commissioners; they are appointed by the President, and their term of office runs to seven years, with the possibility of reappointment. Each Commissioner receives a salary of $12,000 (say £2,500) a year, and together they direct a staff of about 1,700 officers—a big semi-judicial, semi-administrative department, exercising functions in connexion with transport and communication analogous to those divided in this country between the Railway and Canal Commission,

* Paper read to the Post Office Telephone and Telegraph Society of London.

the Board of Trade, the Ministry of Transport and the Post Office. It is interesting to see that a bill is to be introduced into the next session of Congress setting up a separate Commission, to be called the Federal Communications Commission, to control the transmission of intelligence by telegraph, telephone, cable and radio.

As might be expected, the Interstate Commerce Commission, from the quality of its personnel and from the magnitude of the interests with which it deals, holds a place of outstanding interest and importance in the system of Commission control; but it commands no more authority in the legal and constitutional system than does one of the State Commissions. Its decisions and orders may be regarded as *prima facie* worthy of great respect, but they are equally liable to challenge in the courts; and on some vital issues in the matter of rate-fixing appeals from orders of the Commission are at the present time in process of hearing.

In fixing the "fair value" of a public utility on which there is to be a "fair return" it is necessary to arrive at what the Americans call the rate-base, that is the current valuation of the property. The higher this valuation the higher the rates must be. And the agreeing of principles which shall govern the fixing of the rate-base is by no means a simple matter. Should the valuation be the capital expenditure as recorded in the books of the Company, notwithstanding that this may have been inflated by unwise or even corrupt speculation? Should regard be paid to legitimate expenditure on pioneer work, and if so, should a difference be made according as this expenditure has been well or ill recouped? Should allowance be made for goodwill, when this goodwill may consist in the expectation of continuance of high rates? Has the company a right to a return on capital which has been provided out of past revenue?

Again, how about the changes in money-values and in prices which have been so enormously aggravated by the Great War? Ought the man who invested say a thousand pounds in plant before the war, expecting a return of 4%, to be allowed to force up public rates on the ground that similar plant is now worth £1,750, and that a return of 7% is worth no more than a pre-war return of 4%? (These are, of course, two quite distinct questions: the answer to the one might be, No; and to the other, Yes.)

Yet again, how about depreciation? Should a public utility be compelled to provide for depreciation on a systematic basis (and, if so, what basis?) or allowed to adopt an opportunist policy in the matter? And if money which should have been set aside for depreciation has been distributed in dividends, should this be taken into account in fixing a new rate-base?

And when the rate-base has been fixed there still remains the question, What would be a reasonable return to allow on it—5, 6, 7, or what higher percentage? Where is the line to be drawn and upon what principle?

It is not surprising that with questions like these waiting to be answered the Commission system finds itself involved in seemingly endless litigation. But meanwhile the public utilities must be carried on, and practical, if provisional, solution of the tariff difficulties must be found. In practically all cases since the war, revision of rates has meant revision upwards, for this has been necessary in order to enable the companies to remain solvent and to attract fresh capital for the extension of business. As a result, there are not wanting indications that the confidence of the public in the Commissions as instruments for the protection of the consumer is being weakened. Thus, a correspondent, writing in to a recent number of *Telephony*, says: "Most Commissions are viewed with mistrust by the public because for the last ten years conditions have forced them to give relief to the service companies."

In a paper, entitled "What is Wrong with Regulation in Indiana?" which was read by Mr. Harvey Harmon, one of the Public Service Commissioners of Indiana, at a meeting of the Utilities Association of the State last July, he said:—

"During the primary campaign which is now in progress and which is not as yet settled, at least eight candidates for Governor on both the Republican and Democratic tickets declared themselves either for the abolishment of the Public Service Commission or substantial changes in the law."

Mr. Harmon goes on to attribute the discontent largely to the increases in telephone rates which the Commission has been forced to concede, increases resulting largely from a wave of speculation in telephone undertakings. He says "Two-thirds of the telephone industries in the State are in rural communities and whenever an increase of rates is asked the people in those districts where the increase is sought, know about it instantly and resent it at once. The telephone itself is used to discuss the injustice done." Mr. Harmon proceeds to argue that it would be very foolish of the public to allow their disappointment and dissatisfaction to lead them to abolish the Commission. He points out that, after all, it is significant that every appeal against orders of the Commission has so far been taken by utilities and says "Nor do I know of a single case where resort has been made to the Federal Court by dissatisfied consumers."

If there are complaints that the Commissions are failing to perform adequately their duty of protecting the public, there are, on the other side, complaints that they are harsh and oppressive in their treatment of the Companies. One can read this kind of complaint in some recent remarks by the Governor of Illinois in which he says "The purpose of public utility regulation is to provide ample protection for the public from exorbitant rates or insufficient or unsatisfactory service. This purpose is not served by hampering development of utility companies or by preventing their earning a fair return on investment. Regulatory supervision and laws which cripple utilities are no more in the interest of the public good than are those which give to corporations an undue advantage in service or charges."

It is easy to see from such expressions of dissatisfaction as I have quoted, and indeed from the reports of the proceedings of the Commissions, that it would be a great mistake to suppose that the American Public Utility Commissions constitute anything like a perfect and smooth-working machine for adjusting the differences between public and private interest and for guaranteeing to the community, on principles firmly established, ideal public services. What one sees is that in the day-by-day handling of the cases which come before them, the Commissioners are proceeding along empirical lines, treating cases on their merits, compromising, adjusting, taking leaps in the obscure, pushing off difficulties with the knowledge that they will come back—in a word, trying as practical men to make arrangements which will work in the immediate future with a minimum of injustice to the public and of inconvenience to the companies. When it is considered that there are forty-seven or more Commissions, each working in this spirit, it is not to be wondered at that there are differences and inconsistencies in their various decisions and orders. The only provision for co-ordination among the Commissions is a National Association of Railroad and Public Utility Commissioners, which the Commissioners may join in their individual capacity, and which holds an annual convention where topics of common interest are discussed in a useful but entirely unofficial way.

Meanwhile, the fundamental questions of principle, which after all must be discovered and adopted as bases of action if the system is to be anything better than a hand-to-mouth affair, are being hammered out by the slow process of American judicial procedure; and sooner or later it will be established by law whether the proper basis of valuation is reproduction cost new, whether a company is entitled to an allowance for going value, whether accrued depreciation which has been provided for out of revenue should enter into the rate-base, and so forth. But the law's delays are America's one indulgence in the luxurious leisure of the older civilisations.

I cannot resist the temptation to give one more of the brief reports in *Telephony*; it appears in the issue of Dec. 8, 1928, and runs thus:

"*Hearing in Ohio Bell State-Wide Case Indefinitely Postponed.*—The investigation of the valuation of the Ohio Bell Telephone Company for rate-making purposes on Nov. 26 was postponed indefinitely. . . . The Attorney-General had asked the Company to furnish certain data on central office equipment, but that has not been furnished, because as the Company said, the only man who could give the information is seriously ill in a Columbus hospital with an eye complaint. The investigation started in 1925."

It has no doubt occurred to some of my audience to ask whether, if public utilities are to be in the hands of private enterprise, with provisions, however, against the exploitation of the public's necessity and of the monopolistic conditions, it is not better to impose all the necessary conditions in advance, rather than leave control of the safeguards to a Commission on the American model? The reply, I think, is, that such a course is preferable—to the extent that the questions which will arise can be foreseen and provided for. But there is serious difficulty in anticipating the conditions which will arise. Looking backwards we can see how vital changes have taken place in practically all the public utilities, changes which could not have been foreseen at their inception. And can we expect that it will be otherwise in the future? However completely provision may be made for automatic adaptation to the fluctuation or development of circumstances, it seems desirable that there should also be provision for a live and continuous representation of the public interest with which the undertaking is affected.

It is to be expected that as the fundamental questions which have been raised in connexion with the American Commissions become settled, and a body of firm and accepted principle gets established, the Commissions will undergo a change in character and function. The probability is that they will become less judicial and more administrative in the kind of superintendence which they exercise. Administrative bodies in the true sense, however, they cannot be. We speak rather loosely, as in the title of this paper, of Commission *Control* of Public Utilities, but no undertaking can really be controlled into efficiency and economy from outside. Efficiency and economy are essentially internal affairs; and although the American Commissions are supposed to have power to control quality of service, their achievements in this direction are insignificant. Assistance to control can, however, be given by well-informed criticism from without and the administration ought always to be subject to assistance of this kind at the hands of accountants and others. The American Commissions have all along been alive to the value of statistics and accounts in obtaining a proper service of the public and have done excellent work in prescribing forms of account and returns of operating. No doubt they will continue to render useful service in this way, whatever other lines of development they may follow.

There is one interesting and important development which has already taken place in the public utility world in America which is not unconnected, one must suppose, with the assertion of the public interest in utilities and the existence of organised provision for the expression of that interest. The American Telephone & Telegraph Co. has formally declared, and takes occasion from time to time to repeat the declaration, that beyond the moderate return on capital which it at present enjoys it does not seek for profit, but will devote to the public all the advantages which may accrue from improvements in organisation and in technical development; and those of us who have the privilege of contact with the officials of the company know that they are directing its affairs in the spirit of that declaration. Definite recognition in this manner of responsibility to the public, if it should spread among public utility companies generally, would perhaps be hailed as so great a triumph that the Commissions might be expected to sing "*Nunc Dimittis*" and depart. But to any such suggestion that the Commissions were no longer necessary the warier part of the American public would, I expect, reply in the words of an American bishop used in another connexion. "Yes," said the bishop, "we know that the wicked fleeth when no man pursueth, but he goes faster if there's someone behind him."

RETIREMENT OF MR. McILROY.

ON Mar. 31 there passed out of the Post Office Engineering Department one whose loss will be severely felt. Outwardly he was somewhat reserved, and therefore not fully understood by those who only came into occasional contact with him, but those who were fortunate enough to penetrate beyond this outward appearance of reserve found that they had discovered one of the most delightful men it was possible to meet.

It is difficult to say what was the most outstanding feature of his character. Some would lay emphasis on his absolute integrity and strong sense of justice. Others were most impressed by his imperturbability which disasters could not disturb but only bring into greater prominence. This imperturbability was not lethargy, as he would immediately, but quite calmly, begin the organisation of relief measures. Still others are inclined to lay stress on the generosity with which he responded to an appeal to support any good cause ; and some emphasise the wide extent of his reading, especially history, comparative religion and travel.

Mr. McIlroy had a knowledge of the organisation of the Engineering Department such as is possessed by few other men, and he was a mine of information on such subjects as the Telegraph Acts, and the pay, responsibilities, and duties of all grades of staff employed. This information was readily imparted to those who sought his assistance and advice, and was expressed in such a way that one felt as if the opinions were those of a great jurist who had considered every phase of the subject and whose advice could therefore be accepted with absolute confidence.

Mr. McIlroy commenced his service in the Engineering Department in Ireland in the year 1891. After two years at Belfast he was transferred to London and, as soon as his talent became known was selected by Mr. Hookey, who was then the Assistant Engineer-in-Chief, to be his private secretary. Mr. McIlroy remained with Mr. Hookey when the latter became Engineer-in-Chief. Those who remember Mr. Hookey will know that he was a tremendous worker, and tried to keep abreast of everything that was being done in the Engineering Department. This threw a great deal of work of all description upon his secretary who had to assimilate a vast amount of information on all sorts of subjects so that it could be presented in suitable form to his chief. During this period the Trunk circuits were surveyed, valued, and purchased by the Post Office, and the backbone system of underground cables to the Provinces was initiated. Some revolutionary changes in methods of construction were also being investigated and tried out. Negotiations were in hand with the Railway Companies regarding the construction and maintenance of telegraph wires on railway property. Mr. McIlroy took a very active part in all these matters. After the retirement of Mr. Hookey, Mr. McIlroy was transferred as Assistant Superintending Engineer to the Metropolitan (South) District which was formed when the Post Office embarked upon the provision of a telephone system for London. After four years he returned to the Engineer-in-Chief's Office as Staff Engineer in charge of the Construction Section. Here he remained for about 18 months, and characteristically used the opportunity to standardise the construction methods for external work and to issue printed and bound instructions which were accessible to everyone who might be engaged upon that class of work.

In 1909 Mr. McIlroy was transferred to Cardiff as Superintending Engineer of the South Wales District, and his period of service there is looked back upon with pleasure by all those who worked under him.

In August, 1921, he succeeded Mr. Moir as Superintending Engineer of the London Engineering District, in which position he remained until the end of his official career. They have been strenuous years. At the time of his arrival the shortage of line plant and equipment occasioned by the war was still acute, and many thousands of applications for telephone service had to be refused. Moreover, the change from manual to automatic working was in contemplation, involving a fundamental revision of the layout of the area. These two matters had to be dealt with together. Service was to be provided for all the present and prospective applicants, and the plant was to be provided in such a way that although service on the manual exchanges would be given, there would be no appreciable line plant wastage when the conversion to automatic working took place. That service for all applicants was provided in so short a time was due in no small measure to the personality of Mr. McIlroy. He possessed in a supreme degree the faculty of getting the best out of the staff. He trusted them and let them see that he trusted them. He did not worry about details, and at the same time showed that he was ready to discuss any problem that was brought to him.

Mr. McIlroy was always ready to give credit for good work and, even if this work originated in a suggestion of his own, he would not take any of the credit. When he was given the honour of I.S.O. he said that he could not see what he had done to deserve it, and the honour was due to the staff of which he had the good fortune to be the head. Is it any wonder that when he left the District there was profound regret ? He has, however, taken with him fervent wishes that his years of retirement may be long, healthy, and happy.

One thing he cannot take away—nor would he wish to do so—and that is the memory of one who was the truest type of gentleman and whose character was as upright as his striking physical carriage.

J. G. H.

TELEPHONE DEVELOPMENT OF BRITISH TOWNS AT END OF 1928.

BY W. H. GUNSTON.

ON the 31st December last there were 1,759,686 telephones working in Great Britain and Northern Ireland, distributed as follows :—

Post Office system	1,723,307
Hull Corporation	15,700
States of Guernsey	4,226
States of Jersey	3,319
Railway and other private systems having connection with Post Office system ...	13,114
Total	1,759,666

This represents an increase of 125,864 telephones on last year's total—the largest increase yet recorded in this country. The population of Great Britain in 1926 is estimated at 45,500,000, which, if divided by the above-mentioned total, gives a ratio of 25.8 inhabitants per telephone (or 3.87 telephones per 100 of population). In 5 years the total number of telephones has increased from 1,148,095 to 1,759,666—an increase of 611,571 and the ratio of inhabitants to telephones has improved from 39 to 25.8. During this period the London telephone system has increased from 401,065 to 614,183, having added nearly 100,000 telephones to its total within the last 2 years. Since 1926 Manchester has increased from 50,254 telephones to 57,329, Liverpool from 48,349 to 53,308, Glasgow from 47,649 to 52,249, and Birmingham from 39,642 to 45,898.

The subjoined list shows the telephonic development of 50 cities or towns with not less than 20,000 inhabitants and 1,500 telephones. It will be seen that residential country towns and health resorts fairly share the honours with the large cities. The list includes all cities with 10,000 telephones and upwards, except Sheffield (17,129 telephones) and Belfast (14,102) each of which have an average of 29 inhabitants per telephone. The Hull telephone area (Corporation system) has 15,720 telephones, a ratio of about 20 inhabitants per telephone.

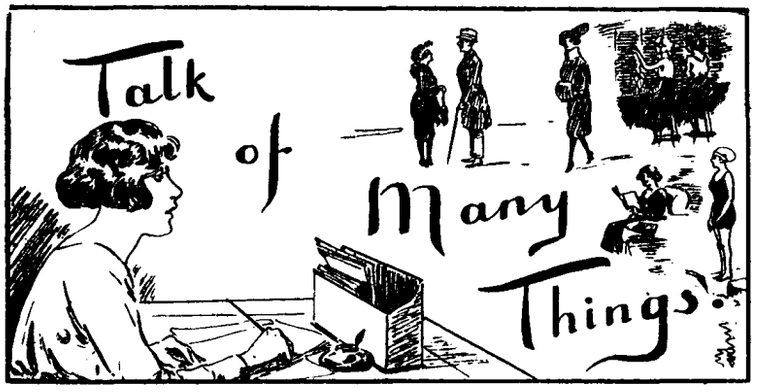
TELEPHONE DEVELOPMENT OF TOWNS WITH NOT LESS THAN 20,000 INHABITANTS AND 1,500 TELEPHONES.

		Population.	Number of telephones.	Inhabitants per telephone.
1.	LONDON Administrative County (*London Telephone Area, including the above and Croydon, Walthamstow, East and West Ham, Leyton, Willesden, Tottenham, &c.*	4,483,200	459,135	9.8
		7,406,000	614,183	12.1)
2.	Guildford	24,987	2,322	10.8
3.	Harrogate	38,938	3,433	11.3
4.	Bexhill	20,363	1,579	12.9
5.	BOURNEMOUTH (including Poole and Christchurch) ...	142,422	10,790	13.2
6.	Eastbourne	62,030	4,592	13.5
7.	Southport	76,644	5,618	13.6
8.	Tunbridge Wells	35,568	2,551	13.9
9.	Chester	40,794	2,916	14.0
10.	St. Albans	25,588	1,676	15.3
11.	Torquay	39,342	2,552	15.4
12.	Woking	26,430	1,717	15.4
13.	Worthing	35,224	2,282	15.4
14.	CARDIFF (including Penarth)...	217,359	13,682	15.9
15.	Oxford	57,052	3,589	15.9
16.	BRIGHTON and Hove	188,946	11,567	16.3
17.	Blackpool	114,681	6,880	16.7
18.	EDINBURGH	420,281	25,187	16.7
19.	Cambridge	59,262	3,501	16.9
20.	Watford	45,910	2,623	17.5
21.	Folkestone (including Hythe, and Sandgate)	54,573	3,052	17.9
22.	MANCHESTER (including Salford, Eccles and Stretford) ...	1,055,473	57,329	18.4
23.	Bradford (including Shipley)...	314,268	16,854	18.6
24.	Aldershot	28,756	1,530	18.8
25.	LEICESTER (including Wigston)	242,780	12,254	19.8
26.	Southend-on-Sea	106,021	5,294	20.0
27.	Ayr	35,751	1,780	20.1
28.	Perth	33,208	1,625	20.4
29.	Bedford	40,247	1,958	20.6
30.	Warwick and Leamington ...	38,808	1,880	20.6
31.	LIVERPOOL (including Birkenhead, Bootle, and Wallasey)	1,115,939	53,308	20.9
32.	Cheltenham	48,444	2,322	20.9
33.	Huddersfield	110,120	5,232	21.0
34.	NOTTINGHAM (including Arnold and Carlton)	292,969	13,829	21.2
35.	GLASGOW (including Clydebank, Rutherglen and Renfrew) ...	1,119,489	52,249	21.4
36.	Exeter	59,608	2,734	21.8
37.	Maidstone	37,448	1,710	21.9
38.	Reading	92,274	3,992	23.1
39.	BIRMINGHAM (including Smethwick, and W. Bromwich) ...	1,068,956	45,898	23.3
40.	Aberdeen	158,969	6,756	23.5
41.	BRISTOL (including Kingswood)	390,018	16,498	23.6
42.	Luton	57,077	2,796	24.1
43.	Hastings	66,496	2,723	24.4
44.	Preston	117,426	4,786	24.5
45.	LEEDS (including Morley) ...	482,265	19,279	25
46.	Shrewsbury	31,013	1,512	25
47.	Dundee	168,217	6,699	25.1
48.	Newport	92,369	3,638	25.4
49.	NEWCASTLE-ON-TYNE (including Gateshead, Gosforth and Wallsend)	458,201	17,295	26.5
50.	Stockport	123,315	4,660	26.5

Expressed in terms of telephones per 100 of population the larger cities show the following results :—

London Administrative County	10.2
(London Telephone Area	8.3)
Bournemouth	7.6
Cardiff	6.3
Brighton	6.1
Edinburgh	5.9
Manchester	5.4
Bradford	5.3
Leicester	5.0
Liverpool	4.8
Nottingham	4.7
Glasgow	4.6
Birmingham	4.3
Bristol	4.2
Leeds	4.0
Newcastle-on-Tyne	3.7

WE TELEPHONISTS



The Thrush and the Orchard.

WITH the greatest respect to the Editress, I must positively decline to say anything about Influenza either in general or in particular. Indeed, I feel rather ashamed of having had it. Hitherto I have weathered all epidemics and, after the fashion of man, I have been inclined to boast of my immunity. The man who lives to be 102 always has a list of excuses (he calls them reasons) for outliving the allotted span, and hitherto I have had a similar and equally incredible list, but of what avail are those reasons now ? To mention them would provoke derisive laughter. I should not feel so ashamed if, instead of Influenza—which everybody was having—I had had some more distinguished or unusual complaint, like gumboil or typist's eyebrow. But I didn't, so I am, and I won't talk about the 'flu.

The anticipation of the Editress may have been intelligent, but I feel that my anticipation was much more intelligent because I took to my bed just as the " Great Freeze " started. I felt a great deal of pity for those shivering, frost-bitten, chilblained mortals—many of them unwashed—who had to turn out of nice warm beds to go to business, and the more I snuggled under the eiderdown the sorrier I felt for them. As a matter of fact, the coincidence of my illness with the " freeze " made Camou rather suspicious, but after making me suck an unappetising thermometer (a barometer tastes no better, believe me) and getting a doctor's certificate, she relented—that is, if feeding me on " slops " can be called relenting. There is no doubt that an occasional illness makes us Edwards appreciate how comfortless and unlovely life would be without our Evangelines.

When the weather had " unfrozen " I decided to get better and I trotted out into the sunshine—after Camou had assured herself that I had adequate scarves and coats on my person and hot milk inside it, and had instructed me not to be " out too long." Bindle the hound led me on a familiar walk and we went through an old orchard. The ground slopes down from it to a winding brook and rises again through a narrow belt of trees to a ridge above. On the left is a copse—black and still in its winter sleep—replete with such scents as Bindle loves, and through it runs a charming little path. Over the whole scene as it presented itself to my eye, was a gentle mist touched by the sun with a glow of gold. The orchard is old and pathetic and it reminds me of an almshouse where the cronies nod and mumble of the past, boasting of original glory and deprecating present attainment. They are mossy, gnarled, and crooked ; some still are upright and others lean feebly and uncertainly. But perched above all and on a topmost branch was Robert the Thrush, bright with cheery chatter and with spring and sunshine and unfolding colours in his song. He explained that he was a bit out of practice but that he had felt that he must drop in for a chat while passing. He said it had been a hard winter, but people generally had been very decent with water and bits of bread, potato and fat, and in consequence he hadn't done too badly. He cocked his eye at me and hoped he might have the pleasure of snailing and worming with me in due course. " Delighted, I'm sure," I murmured.

And then Robert burst again into sweet music—music with delicate phrases, oft-repeated, with little trills of happy laughter, music reminiscent and prophetic. He told of green fields and leafing hedges, of snowdrops and sticky buds, of softer breezes and brighter skies, of gentle rain and fragrant earth and of the music of the air and the low hum of the insects. Even the cronies in the orchard were moved as if in response to old and sweet memories and their branches stirred feebly. Perhaps momentarily the sap had tingled in their veins. I stood and listened with bare head and uplifted face as his music flooded round and through me. Bindle was bored but tolerant and as Robert winged his way we wended down and across the brook home—to home where there was a bright fire and a brighter smile and tea and toast and cushions.

Peace be with the old orchard and blessed be Robert and all his kind. As to our Evangelines—ah, well, " discipline must be maintained " you know, as Mr. Bagnet says in " Bleak House."

PERCY FLAGE.

Tom Hood (and the Weather) "up-to-date."

No sun, no moon,
No morn, no noon,
No dawn, no dusk, no proper time of day;
No sky, no earthly view,
No distance looking blue,
No road, no street, no "t'other side the way;"
No end to any "row,"
No indication where the crescents go;
No top to any steeple,
No recognition of familiar people,
No courtesies for showing 'em,
No knowing 'em!
No travelling at all, no locomotion,
No inkling of the way—no notion,
"No go"—by land or ocean—
No mail, no post,
No news from any foreign coast;
No park, no ring, no afternoon gentility;
No company, no nobility;
No warmth, no cheerfulness, no healthful ease,
No comfortable feel in any member,
No shade, no shine, no butterflies, no bees,
No fruits, no flowers, no leaves, no birds—
November?—No, March!

Telephone Version of Ye Floral Dance.

When the Auto System hove in sight—
Before the Manuals had taken flight—
Ev'ry Subscriber, far and nigh,
His brand new dial was taught to try
In our quaint old London Town.
Through to a Demonstration Set,
Each tone signal he had to get—
Finger-holes he was taught to ply
And code his numbers with careful eye,
For the Manuals were closing down!
So he had to handle a curious 'phone
And list for the sound of the dialling tone.

Mustn't say "Hello!" but be quite dumb,
And wait for the sound of a low-pitched hum—
Half-mesmerised, as in a trance
Each cut his capers in the Auto dance!

These demonstrations were most entrancing,
And the Subs. for transfer were still advancing—
City magnate and high-born dame,
Baker and banker—all the same,
In our quaint old London Town.

Upon each dial a finger was placed,
And twiddled around in trembling haste.
Whether they grasped it all I know not—
Whether they got a call they cared not—
But they followed the instructions laid down!
Then *left alone with their curious 'phones,*
They tried to distinguish the different tones—
Dialling, Ringing and Busy hum,
Or a wail like the whistle in a Rugby scrum—
And in their dreams at night, perchance,
They heard the music of the Auto dance!

I felt so lonely moping there,
Before a switchboard almost bare—
For there were but two or three
Of all my Subs now left to me,
In our quaint old London Town.
Then suddenly everything went "dis,"
And I thought to myself "Has it come to this?"
With my Subs. gone west life was blank indeed!
So I joined the rest in a wild stampede,
For our Manual was closing down!
Now I comfort the Subs. with the curious 'phones,
Who complain of the System with dismal groans!
I hear them bellow, in tones irate,
"I dial Sloane and get Bishopsgate"!
Strong men weep and others swear,
And dial "O" in wild despair—
They fume and frown, all round the Town
Alas! for the Auto's sporting chance!!!

C. A. S.

London Wall.

The annual treat to some of Islington's poor children took place on Saturday, Feb. 22, at the Medical Mission Hall, Britannia Row.

About 200 girls and boys were present and Miss Jessie Moore was, as usual, the "Commanding Officer." A willing band of helpers undertook the task of waiting upon the young visitors who, drawn from the Essex Road and neighbouring by-ways, were obviously deserving—and appreciative—of the good fare provided for their delectation.

Following a substantial meal, entertainment was provided in the form of "human marionettes," conjuring and ventriloquism. A distribution of parcels containing toys, games, books, sweets and cakes terminated a very happy function and the youngsters departed in pardonable disorder, each clutching a farewell gift of a bright new penny.

The members of the Nautilus Swimming Club held their annual Social for the distribution of prizes at the Anderton's Hotel on Jan. 28, 1929.

Mr. James kindly acted as Master of Ceremonies and was ably assisted by Mr. Sanders.

The large gathering had another opportunity of hearing the Misses C. Hunt and I. Morris, whose vocal solos are always much appreciated.

Miss Johnstone presented prizes to the following winners:—

Misses V. Long, N. Carpenter, M. Dominey, R. Dixon, L. E. Wilson, E. L. Kemp and E. K. Smith.

The Club cup became the property of Miss V. Long, who won it three years in succession.

A very enjoyable evening! May Miss F. Richards live long and organise many more.

G. M. T.

Holborn.

On Feb. 16 a merry afternoon was enjoyed by 200 children of the King's Cross Mission, when the staff of the Holborn Exchange gave their eighth annual Christmas tea. On arrival at the gaily decorated hall each kiddie received a paper hat, whilst beside each plate was a gay handkerchief (so useful for surplus cake!). Grace being duly sung the real fun started and buns and cake disappeared like magic. Cisterns may burst! but surely no roof was nearer rising than when the cheers of thanks went up from 200 happy youngsters.

Tea was followed by a conjuror, ably assisted by two small members of the audience, and "Joey" the clown caused much merriment. All good things must end, and with hands and pockets full with an orange, apple, a bag of sweets and a bright new penny, we said "Good-bye" till next year.

E. C.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch.

THE business done by the Contract Branch during the month of February resulted in a net gain of 5,013 stations as compared with 6,263 stations last year.

During the extremely cold weather in February, Contract Officers working in residential areas found frequent difficulty in obtaining interviews. When they rang the bell of a house someone would eye them through a window and then presumably return to a fire, and any amount of ringing on the front door bell would not induce them to come and talk to the man outside. This probably accounts to some extent for the reduced net gain, and it may be desirable to consider now, in readiness for the next severe frost, the possibility of making our Contract Officers look like plumbers!!! They would then be welcomed with open arms and the anger of the duped might be turned away with the offer of a telephone to enable all shopping and errands to be done from the fireside!!!

There were 1,184 exhibitors at the British Industries Fair at the White City this year, and orders were taken for 379 exchange lines and 49 call offices, as compared with 311 lines and 28 call offices last year.

My attention has just been drawn to the following notice on a local tradesman's price list:—

"My telephone was installed for the express purpose of being of benefit to my customers.
During inclement weather the telephone is a tremendous advantage.
Please do not fail to make the greatest use of same.
TELEPHONE: XXXX 1390."

This is a step in the right direction.

It is good at times to know what other people think of us but what are we to think when subscribers' opinions of us are as far apart as the following two letters indicate :—

Dear Sir,—The telephone is as bad as ever, thanks to a rotten operator, but I want my top extension moved down to next storey.

Do I understand that a private house cannot have a wall bracket 'phone. I think I did when I put extension in ground floor front—which, if so, of course, convinces me of the loathsome type that creeps into government offices—men and women who ought to be shot or drowned in batches of 100 or so until the breed is exterminated—What a happy England it might then be—I can assure you the thought of the "Civil"!!? *Servant*?? mentality fills me with contempt and loathing that men can become so base and contemptible. Women, of course, are past praying for; vulgar irreligious wantons.

As usual, I remain your angry mistress,

.....

Dear Sir,—In the first place I should like to express to the London Telephone Service my thanks for the trouble they have taken about my telephone during the past few years : the numerous stops they have put on in order to ascertain the cause of so many wrong numbers. The chief difficulty was in being called up at all times for 7568. I am inclined to think that the fault lay with the subscribers who used this number; they evidently slurred over the second digit, thereby causing aggravating mistakes. . . .

I should like to take this opportunity of expressing my thanks to the Post Office and to add that it gives me great pleasure at all times to speak and write of the efficiency of the London Telephone Service, which I find better than any telephone I have used in various parts of the world.

Yours faithfully,

.....

A subscriber on being informed that an internal removal could be carried out, replied : "I did not know that the London Telephone Service had a surgical department."

* * * *

The London Telephonists' Society.

On Friday, Mar. 1, the London Telephonists' Society held the fifth general meeting of the session at the City of London Y.M.C.A., Aldersgate Street, E.C.4.

There were a large number of members present, and tea, which was served in the ante-room prior to the meeting, made the opportunity for that social intercourse which has been so prominent a feature of the season.

At 6.30 p.m. the Chair was taken by the President, Mr. Horace Dive.

The programme for the evening included the reading, by the successful competitors, of the prize-winning papers of the year, as follows :—

Class A.—Telephonists.

"Pity the Poor Automatic Telephonist."—Miss B. McDonald, H.Q. Obs. Office.

"The Fall of the Empire (Leicester Square)."—Miss G. Latimer, Temple Bar Exchange.

Class C.—All Other Grades.

"Something to Look Back upon."—Mr. J. Shepherd, Tandem Exchange.

It can be imagined from the titles that the matter contained in these papers was varied, but it need scarcely be said that, as prize-winning papers, they were uniformly good. They were read by their respective authors with such charm and force as to render them of the greatest pleasure to the audience.

A short story, written by Miss M. Carter, of Sydenham Exchange, was then read. This story was called "Treason in the Service," and the suggestion of such an improbable condition aroused the audience to a state of thrilled expectancy. Nor were they disappointed, and Miss Carter's ingenuity was rewarded with laughter and applause.

A prize was awarded to Miss C. Lear, of Mayfair Exchange, for the following limerick, "When in your house a burglar you meet, A 'phone in the house is worth two in the street." Miss A. G. Turner, also of Mayfair Exchange, won the prize offered to the telephonists who entered into the debates following the meetings.

It has always been the privilege of the Society to retain the interest of the Controller, and his presence at the meeting was very greatly appreciated.

Mr. Valentine very kindly presented the prizes, and he spoke gratifyingly of the interest which he observed was sustained in the affairs of the Society by all its members. He also said how especially pleased he was to notice that the more senior members never lost touch with the proceedings.

In conclusion, Mr. Dive passed a vote of thanks to the Controller, which was carried with acclamation.

Football.

The arrangement of fixtures left the L.T.S. team without a league game for practically a month, and after the splendid victories over the two leading clubs in February, it was feared that the team would not be as effective on the resumption of league football on Saturday, Mar. 9, when a visit was paid to Acton to play the return game with the Ministry of Health.

The long rest, however, seemed to have benefited the forwards in particular, and in a heavy scoring game we succeeded in winning by 6 goals to 3. The forwards played excellent football and Gordon, in addition to scoring two goals, led many attacks with much of his old-time skill. Bishop and Jeffery divided the other goals. The team seem certain to finish in a high position in the league, but it is probably now too late to expect them to annex the championship.

* * * *

Cricket (Contracts).

Arrangements are well in hand for the forthcoming Cricket season and Mr. "Tim" Cowdrey has been selected to captain the team. The league competition promises to be even more interesting this year by the inclusion of the "Messengers."

Instead of only three teams there will now be four, requiring 6 matches to be played by each team.

* * * *

Bowls.

Considerable progress has been made with the programme for the forthcoming season at Chiswick. There will be 15 Service teams competing in the league tournament divided into two sections A and B. The London Telephone Service team will compete in the A section, and the proposal is to reshuffle the teams in the following season on the basis of the positions occupied at the end this year of the clubs in the respective sections.

The intention is to develop some system of promotion and relegation and thus make the competition more interesting.

The Civil Service Championships will be held at Chiswick this year and the Committee have decided to enter a team in the "rink" competition. Individual members can, of course, compete in the "Championships," and the committee hope that the London Telephone Service will be well represented.

* * * *

Table Tennis.

The open competition which has been running during the winter months was concluded on Mar. 6, when the men's semi-finals and final were played.

Mr. J. Cameron, of the Accounts Branch, was the winner after a hard tussle with Mr. G. Lewis.

The ladies' competition finished a week earlier, and Miss P. Gardiner beat Miss J. Slaney, both of the Accounts Branch. Prizes were awarded to the winners and finalists in both sections. The President of the club, Mr. W. R. Bold, on each occasion made the presentation of prizes given by the L.T.S. Sports Association.

The competition proved very popular. Ninety-five entries were received (55 ladies and 40 gentlemen).

The games were played on portable tables in one of the Accounting Rooms and the conditions altogether were quite good.

Entries were received from each of the Branches of the L.T.S., including several from the exchanges. The T.T. Club will arrange a further competition next season, when it is hoped a still greater number of competitors outside the club, particularly from the exchange staff, will enter. Mr. Hough, the secretary, deserves the warmest thanks for the capable manner in which the competition was organised, and the attendance of the President, Mr. Bold, at so many of the matches was much appreciated.

* * * *

Netball Competition.

Matches in the second round of the competition for the "Liddiard Shield" resulted as follows :—

Controllers' Office (1st team), w.o. Rodney (scr.).
Controllers' Office (2nd team) 13, Holborn (2nd team) 6.
Central 24, Thornton Heath 6.
Clerkenwell 12, Holborn (1st team) 8.

Semi-finals.

Controllers' Office, 1st team 36, 2nd team 10.
Central 15, Clerkenwell 12.

The final tie between Central Exchange and the Controller's Office 1st team will be played on the Civil Service Sports Ground at Chiswick on May 4, when it is hoped the donor of the Shield, Miss J. Liddiard, will be present to hand the trophy and medals to the winners. In addition, a five-a-side knockout tournament will be held. Particulars can be obtained from Miss E. L. Sanders, Controller's Office.

THE

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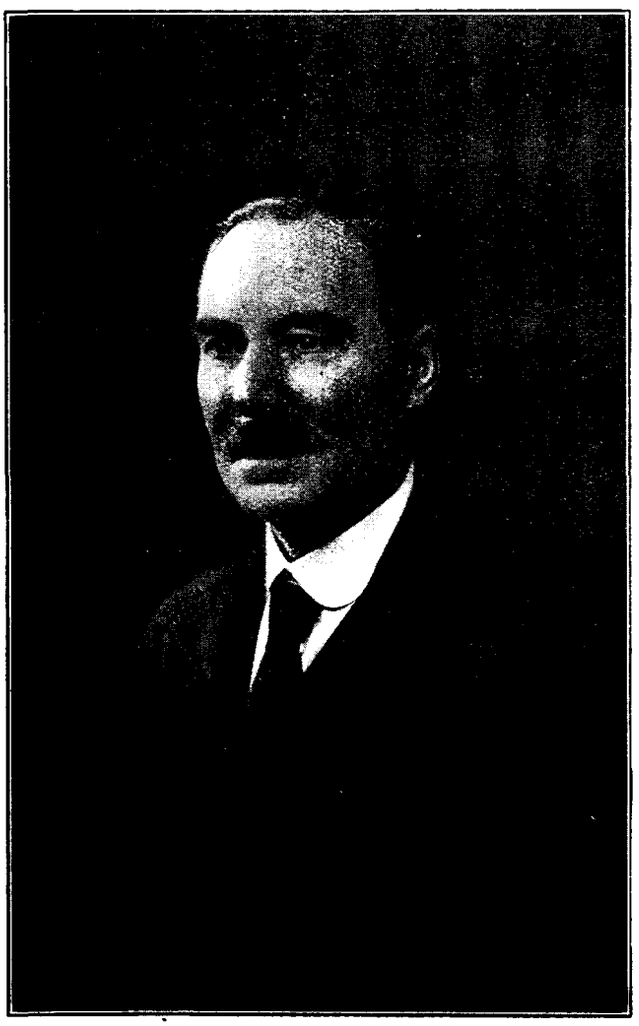
TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXIV.

MR. FRANK ERNEST MARKIN.



THE subject of our portrait, Frank Ernest Markin, needs no introduction to telegraph men and women in Great Britain.

Born at Melton, Suffolk, in 1869, Mr. Markin left his native heath in 1888 for the less salubrious but more invigorating atmosphere of Manchester. There, by his native ability and sound judgment he passed through the various grades, becoming Chief Superintendent, Telegraphs, in 1926, and by his great personal charm endeared himself to all those with whom he came into contact.

A shy and retiring man with no love for the limelight, he nevertheless became an influential member of the executive of the old Postal Telegraph Clerks' Association, and in that capacity brilliantly represented telegraphists before the Bradford and Hobhouse Parliamentary Committees.

Mr. Markin retired from the Service in April. His departure will be regretted by a large circle of friends and colleagues. We wish him long life and happiness in his well-earned leisure.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

IV.—BY A REPRESENTATIVE OF THE IMPERIAL CABLE AND WIRELESS SERVICES.

[NOTE.—*The Editing Committee accepts no responsibility for the views expressed in this series of articles.*]

THE telegraph was born of man's desire to establish speedy communication with his fellow men. If it fails in that respect, and falls so far behind other forms of communication as to become comparatively slow, the necessity and desire to use it will decrease, and ultimately disappear.

Speed is a comparative thing. When the telegraph was established man progressed over the earth's surface and the face of the water very slowly, when judged by modern standards. His journeyings were also uncertain. Until the end of last century, the speediest form of transport was the railroad, but the advent and swift development of the internal combustion engine has resulted in almost revolutionary changes in travel, particularly in those countries with highly developed road systems, and, although travel by rail is faster than ever before, traffic is declining. The diminution in the number of passengers carried by the railways is a serious matter to the companies, but a source of joy and revenue to the omnibus proprietors. Both parties are conscious that travel is increasing; the problem is to assign to each system the class of traffic which it is best equipped to deal with.

HOME TO HOME AND POINT TO POINT.

Railway passengers must of necessity be deposited at some more or less central point (a station) from which they find their own transport home: the 'buses very largely provide a door-to-door service. On short or medium distance journeys the latter system unquestionably scores: on long journeys its success is problematical.

Consider the telegraph and telephone services on the same basis, and the rapid growth of local and short-distance telephoning and the concomitant decrease in revenue and traffic to the telegraphs is explained. It also suggests why long-distance communication is still largely in the hands of the senior service. The telegraph is a point-to-point service, the telephone a home-to-home one. Pursuing the analogy, the similarity extends to the problem of acceptance, except this, that while the railways have, until recently, made little or no attempt to "road feed" their trains, the Post Office, in a moderately successful, but continually growing way, has fed the telegraphs through the phonograms.

Unfortunately the analogy ends here, for, while the railways, by securing a return of the lost traffic, could once more show a profit on their capital, the telegraphs, even if the "good old days of morse working and the sixpenny telegram" were to return, could not, unless—

PRIZES OFFERED.

To the individual who can complete that sentence a glittering prize will deservedly be awarded. In fact several such prizes, for he will surely deserve well of the nation, of the staff, and of the business man. Not that the last mentioned ever gives much away at any time: in fact the main problem of the telegraphs appears to arise from his desire to take largely without giving adequately in return. For all I know the policy of the Government may be to keep rates as they are, but any increases would certainly be opposed by the commercial community as a whole. What, then, should we do?

DECLARE A POLICY.

It costs approximately 1*s.* 4*d.* to accept, transmit, and deliver a shilling telegram, from which fact it will be apparent that unless we are to adopt the system of the Irishman who sold all his goods at a loss but lived on the turnover, an increase in traffic will not solve our financial troubles.

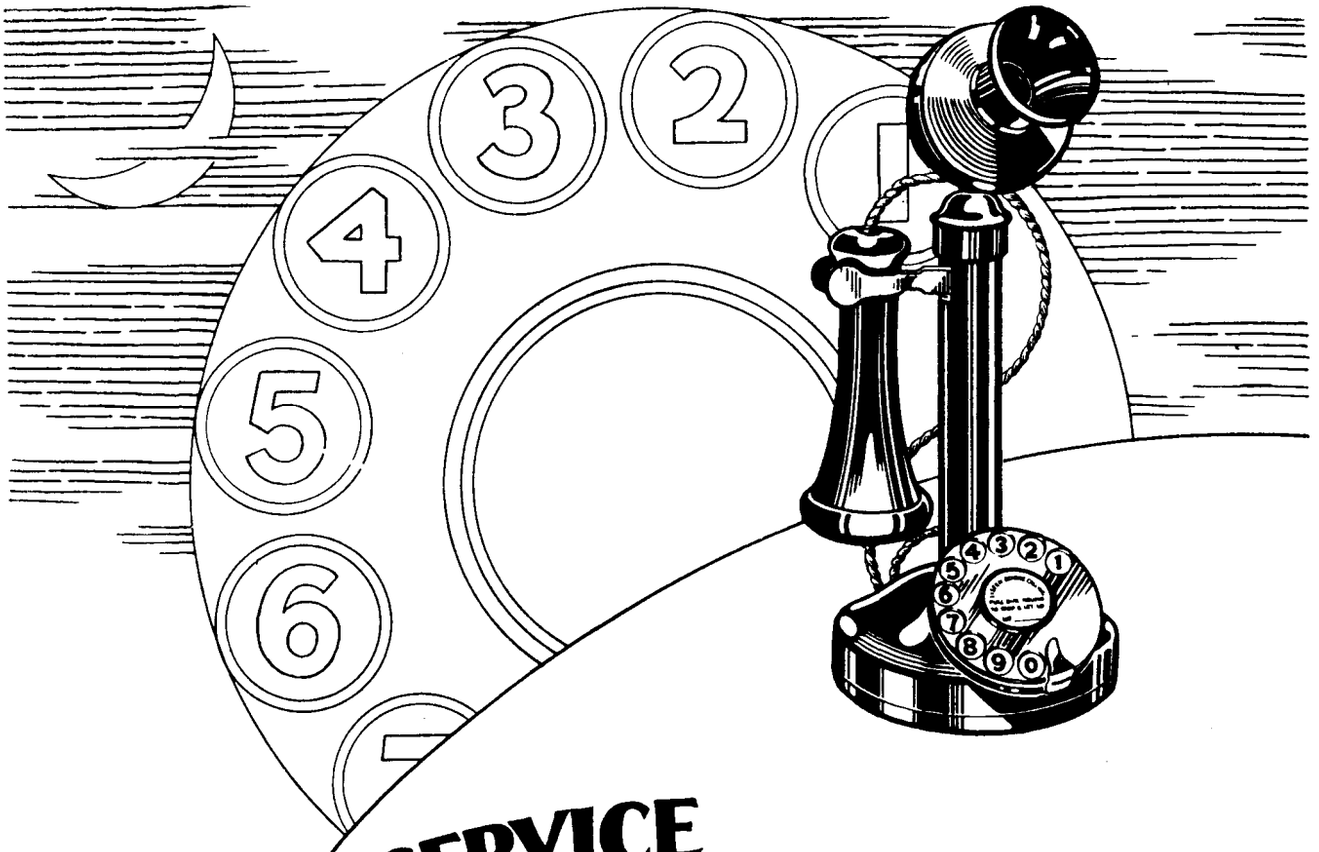
Which fact prompts me to ask for a clear declaration of telegraph policy by some responsible Minister of the Crown. The sixpenny telegram did not pay. The shilling telegram does not pay. There is no indication of a further increase. Obviously, either operating costs must be reduced (these work out at 1*s.* 1½*d.* per message) either by lowering wages (groans from everybody, including the writer), or a system devised under which a greater and more constant output per man may be obtained. Lower wages in not a few industries have been enforced with, in general, disastrous results, and without assisting the firms directly concerned to a marked degree, while the question of output embraces more than the staff: apparatus also is involved.

No, what is wanted is a clear declaration on the question of whether the telegraphs must be made to pay. If the service has to show a profit on its working, and to be run on accepted business lines (we know what that will mean), the sooner we are told so the better: but we must also be given a free hand to work out our own salvation as a department. If the policy is to make the telegraphs a national service, thoroughly efficient, of wide ramifications, and of real use to every citizen of this country and to other nations, then we also ought to be told. Of course, the latter policy involves finance, and it is granted that a limit of expenditure, or subsidy, must be reached, but that limit could vary (again within limits) according to the needs of the country and the development of the service. I cannot speak for anyone but myself on the point, but I should imagine that the absence of a declared policy on this matter has had, still has, and always will have a most unsettling influence on the whole telegraph staff which sees movements, staff alterations, new methods, new standards, &c. being experimented with and enforced without their having any definite idea of the policy behind them. The nightmare deficit on the service ought to have been faced long ago. I do not say that it has not created concern in the proper administrative quarters, but mere anxiety never cured sickness. The diagnosis shows the patient to be suffering from financial malnutrition: what is the cure? The first step in the cure of disease is to recognise the cause of the trouble, and the sooner it is recognised (publicly, in this case) the sooner will it be possible to commence the cure.

SOME QUESTIONS.

If the policy of the Government is that the telegraphs are an essential part of the life of the nation, that they should be made to pay if possible, but that if they cannot (under existing tariffs) they must still function efficiently, then one may be pardoned for asking why they are not as efficient as the members of business organisations demand? Why transmission times are increasing between long-distance stations? Why delay has even been recognised? Why, in other words, the service has been permitted to slow down, and its usefulness thereby decrease?

If, on the other hand, the telegraphs must be made to show a profit on the invested capital, the questioning is resumed by asking why the Press of the country is still subsidised through the telegraphs? (I recognise the dangers to small provincial papers which would follow the raising of the Press rates. The big syndicates could pay where the small independent firms could not.) Why, if there are good reasons for continuing the Press (and advertising) subsidy, the Treasury does not establish a principle by making a grant to the department to cover the loss on these particular telegrams, and on other unremunerative traffic? Why at least one thousand telegraph offices are maintained in almost non-traffic areas? And there are many other philanthropic actions, both to the public and other departments, which might form the subject of questions.



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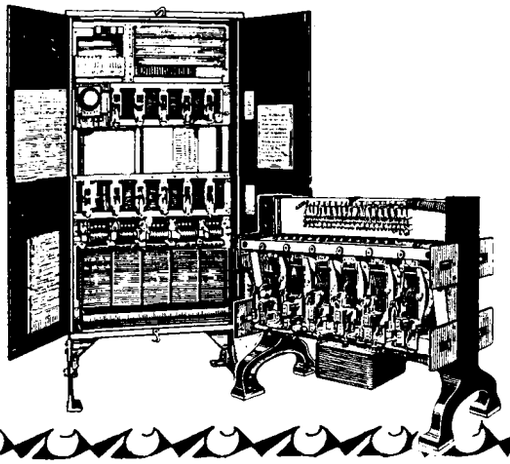

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EXACTING FELLOWS.

The keenest critic of the Post Office is that vaguely indefinable person, the business man. As a class he worships only one thing, success, which too often only means profit. The telegraphs are therefore not a success, except when they provide him with everything he wants irrespective of cost. But only while he is a business man: when he becomes taxpayer, he speaks with a different voice. Personally, I have formed the opinion that the nation is not unduly disturbed over the loss on the telegraphs: the Post Office as a whole shows a profit of many millions per annum, and, for reasons which will be apparent to students of business principles, I would strongly support any proposal to lump all Post Office accounts into one. That would not mean that we could then lie back and be content with the telegraphs as they are. The telegraphs must be made as efficient as scientific skill and business methods can make them: apart from the question of profit they must be a real public service, their speed must be raised as near to the theoretical maximum as possible, and the staffs must be kept fully conversant with departmental policy in order that they may work in with new schemes intelligently.

SOME SUGGESTIONS.

1. The telegraphs are likely to become long-distance links, and the telephones largely short and medium-distance ones. The necessity for unified control of the two is apparent. The two departments should be amalgamated.

2. The provision of apparatus at all main offices which will carry telegrams at high speed, and with great accuracy and truthfulness is imperative. According to responsible controlling officers, the Baudot fails in stability, and as a result of these failures the confidence of the operating staff is impaired. Apparatus faults are distressingly frequent. That the Baudot should work is good in theory: that it does not work well enough is supported by practice. All staff, engineering and otherwise, engaged in instrument-room work should be under the control of the Postmaster and be responsible to him.

3. The too close positioning of instruments at concentrator switches is responsible for the loss of many staff hours due to the difficulty of hearing the weak sounders properly. The difficulties of space are serious at the larger offices, but anything which tends to hinder output is also serious.

4. A greater degree of local autonomy in points like that mentioned in the preceding paragraph is desirable.

5. We require much more specialisation in the telegraphs. Writing duties have been specialised to some extent, but operating duties handling live traffic are not less important. The question of specialisation affects the promotion question, and for that reason and because it would divide the staff into smaller groups, it would perhaps be necessary to

6. Abolish the present Overseer class and substitute a Chief Clerk class for each specialised section.

7. The acceptance and transmission of telegrams should have priority over all other Post Office business at offices where no specialised accepting point exists. Telegrams should not be delayed while parcels and other comparatively non-urgent business is transacted.

8. The phonograms should be staffed by telegraphists and the staff and the circuits should be under the control of the telegraph chief. (This proposal is subject to unification of control not being immediately practicable.)

9. Delivery rooms in large cities should be under the direct control of an officer with the telegraph sense. Postmen cannot be expected to acquire that desirable thing late in life.

10. A Travel Telegram should be introduced, in order to encourage all travellers to use the service. Travel telegrams should be sold in books of twelve specially stamped forms for ten shillings, and the texts of the messages must relate to travelling. These messages would bear a special indicator, which would be counted as one word: the discount for cash would therefore only be one shilling in twelve telegrams. Advertising space in the books could be let to hotels, banks, shipping agents and railway companies &c.

11. Christmas telegrams should be extended to the Inland service at 6*d*. each, the text being standardised in one form only.

12. The fee for registered addresses should be raised by one pound, and all such registrations should fall due on one date, preferably a winter month.

13. The Night Letter service should be extended to include towns which can be reached by post from the main receiving office.

14. Repetitions of doubtful words should be accepted over the telephone the addressee being required to repeat the preamble. The whole of the fee should be refunded if one error is disclosed.

15. Receipts should be free. All that the receipt form need contain is the serial number of the message and an impression of the dated stamp.

16. All staff engaged in instrument rooms should be entitled to a ten-minutes' relief during the first and second portions of a continuous duty of eight hours.

17. Telegrams addressed to houses which are found closed, and at which no letter-box is provided should not be sent out on second and third occasions, without a fee being collected for extra services rendered. Alternatively, the telegrams should be posted.

18. Telegrams addressed to offices at which no regular messenger staff is employed should be charged sixpence extra to cover part of the additional cost of delivery.

19. Telegrams insufficiently addressed (this is frequently done to save a penny or two) should be advised at once, but the fee for amended addresses in the same town should be reduced to sixpence.

20. An officer highly trained in internal wiring and mechanics of complicated telegraph apparatus should be appointed at each large town. His sole duty would be to supervise plant, and he would be responsible for its efficiency. The present technical officers are not sufficiently qualified to act as plant superintendents.

21. The delay on telegrams from London is (so far as my own office is concerned) much heavier than the delay to London. This ought not to be.

22. The capital charged against the telegraphs should be written off.

23. An officer of supervising rank should be appointed at each large centre to represent the telegraphs in all its dealings with the public. He should be properly trained for this work at headquarters and should visit all complaining firms and individuals personally. His area should be a large one in order to secure a more or less standard policy and have the Department speak with but one voice.

[The next article in the series, by an Engineer, will appear in the June issue.]

NORTH MIDLAND DISTRICT TELEPHONES: PRESENTATION TO MR. F. O. WATSON.

ON Feb. 7 Mr. F. O. Watson, Assistant Traffic Superintendent, was presented with a mahogany china cabinet and silver-plated hot-water jug to mark the occasion of his forthcoming marriage. Mr. C. N. Carter, Traffic Superintendent, in asking Mr. Watson to accept the gifts, spoke of the regard in which the recipient is held among his colleagues, while other members of the Traffic Staff wished Mr. Watson and his bride-to-be every happiness. Mr. Watson, in his reply, expressed thanks for and appreciation of the gifts and good wishes.

INTERNATIONAL TELEPHONY.

BY H. TOWNSHEND.

(*Continued from page 129*).

I SHOULD remark here, incidentally, that the system so far universally adopted in Europe, and embodied in the International Telegraph Regulations, of dividing the rates *on each international call* between all the terminal and transit Administrations concerned in handling it, is not the only way in which the latter might be remunerated for their services in providing connexions for the terminal countries. I personally think that, while the present system has great advantages in an early stage of development of long international lines, the time may come when some, at least, of the transit countries may prefer to lease their lines to the terminal countries using them in return for adequate fixed rentals, thus leaving the latter free to fix their own charges, and accessory services, in accordance with the economic conditions and with the particular demands of their own public.

The effect of these complications, combined with the somewhat dangerous attractions of rate standardisation, and a historical over-emphasis in Europe on cost-accounting as a factor in rate fixing have, in my view, only just failed to have unfortunate results.

Examples of Rating Questions.—Ineffective Calls.

Thus, for example, at the Paris Telegraph Conference of 1925, the view was urged, and very nearly adopted, that since the failure of a subscriber or his employees to reply when his bell rings for an international call may in certain circumstances involve the Administrations in a loss of valuable line-time, such calls, though wholly ineffective and useless to the caller, should be charged up to him, as though he had really had 3 minutes' conversation. I think it is not too much to say that, had this proposal gone through, the subsequent rapid growth of international telephony in Europe might have been sharply checked. In the first place, comparatively few subscribers would risk their money on the chance of a bell being answered in a foreign town hundreds of miles away; in the second place, the Administrations being paid equally for effective and ineffective calls, would not have before them a standing realisation (from their statistics) of the necessity of striving to keep down the number of ineffective calls; and, in the third place, the service would have been saddled with constant friction (arising out of disputes about what happened in particular cases) between the Administrations and their subscribers. As it was, the Conference wisely left the point undecided (covering it by one of the permissive or optional regulations to which I have referred), and it is significant that, only two years later, the Advisory Committee recommended that no charge should be made in cases of "No Reply" from the called subscriber's telephone. If the Paris Conference had accorded a similar optional recognition to the personal call as well as to the préavis, to which I have alluded, I think it is possible that a similar result would by now have followed.

The Uniform Rate-Scale.

Again, three or four years ago, it was felt that a number of countries which were being brought, for the first time, into the European international telephone network, wanted some guidance as to the rates which they should charge at the outset on their international calls. The C.C.I. accordingly charged a Committee of Rapporteurs with the duty of examining confidential statistics furnished by a few of the more experienced Administrations relating to costs on a limited number of modern circuits, and asked the Rapporteurs to produce some general advice on the subject. Events showed that, at that stage of development, there was a strong feeling in favour of the Advisory Committee recommending all the Administrations to adopt a uniform rate-scale (of so much in gold standard currency per 100 km. plus a fixed operating charge for the terminal countries), to be applied to calculate automatically each country's share of the rate on a 3-minute call anywhere in Europe, regardless of local costs and of variations in demand. (In passing, I have seen this rate-scale referred to as though, if it had been adopted, it would have resulted in a uniform scale of rates based on crow-fly distance being charged to the public for calls between any two European towns. This is of course not even approximately the case. On the contrary, it would have resulted in many cases in there being two different charges to the public for calls between the same places—e.g., between London and Berlin via Holland or via Belgium—according as the call was routed in one way or another, though the routing of a telephone call does not, of course, concern the subscribers in the least.) After prolonged discussion, however, the Rapporteurs confined themselves to a declaration that the suggested standard scale of charges should suffice to cover the costs in favourable conditions in a number of relations (i.e., between a number of countries), and added that, in view of the difference of local circumstances, they could not recommend a uniform scale of rates. In spite of this caution, a number of countries—not, of course, all—adopted the rate-scale on all their international services; and I personally fear that it is already beginning to land some countries of high cost into difficulties. If this is so, one would expect these countries to find that, when their existing new large-capacity cables become exhausted, the returns from their traffic will not suffice to finance, or to justify financing, new ones, so that, either the speed of service will have to be allowed to suffer—a retrograde step which every Administration would be most reluctant to take, or the rates in these countries will have to be raised—always an awkward proposition for any public utility to tackle.

"Urgent" Rates.

This difficult question of international rating has been still further confused by a difference of opinion on a question to which I have already referred—namely, the propriety of admitting what are known as "Urgent Calls," that is, calls accepted at double or treble the ordinary rate, on condition that if there is congestion on the international line, they are to receive priority over all the ordinary calls on hand. There are two views on this, one held practically throughout the Continent of Europe; the other held in England, Spain, and America; and I do not think I can do better than quote Dr. Feyerabend and Mr. Gill as representing authorities taking these two views respectively. First of all, the European view. I am quoting Dr. Feyerabend's book, cited above:—

"In striving after the highest possible use of the Trunk lines two contrary conditions operate: the unequal incidence of the traffic and the unavoidable loss of paid time because it is practically impossible to range the calls immediately one after the other . . . The Administration is compelled to calculate the number of lines so liberally that the calls can be put through even in the hours in which the traffic is heavy without too long a period of waiting. Whilst the pressure of calls in the busy period can hardly be avoided, the loss of paid time arising from official signals, the calling of subscribers, and slack operating, can be lessened by special measures . . .

"In spite of the measures for speeding up, the fact remains that if one does not increase the plant *beyond an economically tolerable measure*"—[the italics are mine]—"the trunk traffic reaches daily a high peak at which the calls are crowded together and during which long periods of waiting are unavoidable. The desire to make calls in specially important cases with priority over other orders was, therefore, early expressed by subscribers. Accordingly, the Telegraph Administration, supported by the institution of urgent telegrams since 1888, has admitted Urgent calls which are effected at a threefold charge with preference over ordinary calls. They always strove to keep the number of preferential calls as low as possible, and for this purpose so to provide plant that ordinary calls could be dealt with even in busy periods without too great delay. Before the war the urgent calls did not exceed more than 5 to 6% of the total trunk calls, a figure which, having regard to the reasonably low trunk charges of that time, could be considered as tolerable. During the period of money depreciation the urgent calls increased in consequence of the unusually heavily increased traffic, for which the relief routes (Absatzwege) did not by any means suffice, and in consequence of the much too low charges lagging behind the money depreciation, even the urgent calls had to wait hours long to mature. As the most important trunks were fully loaded with urgent calls, a further priority had to be created. This occurred in 1923 with the introduction of 'lightning' calls, first with a hundred-fold increase, since 1924 with thirty-fold and since 1927 with ten-fold charges. In the years 1923 and 1924 the number of lighting calls and the receipts from them had a certain importance—now they are an exceptional occurrence. The urgent calls, too, in the inland German service since the stabilisation of currency and when a considerable increase of relief lines was available by the extension of the main cable system, declined in the year 1926 to the moderate position of 3%. The year 1927 will bring a further decline in the figures." (This passage, of course, relates to the German internal service, but I think it illustrates sufficiently the principles governing the "urgent call" system wherever it is adopted.)

Mr. Gill, in the paper which I have already cited, summarises the position as follows:—

"There are two entirely different foundations for the" (long-distance) "rates in force in Europe . . . and the two may be stated in condensed form, thus:—

"(*a*) Service at as cheap a rate as possible, this rate being termed 'Ordinary.' Ordinary calls should experience a delay of not more than 30, 60 or 90 minutes, according to the length of the circuit. Calls may be ordered to be 'Urgent' at triple the ordinary rates, or to be very fast ('Lightning') at 10 times the ordinary rate. Equipment is not intended to be provided to meet busy hour loads but has to be provided on the basis of the loads spread out by reason of the delays permitted.

"(*b*) All calls are of equal urgency and pay the same rate, called here the 'Day' rates. A faster service with the delay not exceeding, say, 10 minutes, is aimed at. Equipment is provided to meet the busy-hour load.

"As will be expected, plan (*a*) leads to more calls per line per day, longer delays and a cheaper ordinary rate.

"Plan (*b*) leads to fewer calls per line per day, a faster service and a 'Day' rate which is dearer than the ordinary rate under Plan (*a*)."

Mr. Gill sums up in favour of plan (*b*) on two main grounds:—

First, that if there is any appreciable proportion of calls paid for at the triple "Urgent" rate, the *average* rate paid by a subscriber is inflated by his having to order the calls he wants to get through quickly as "Urgent"; so that the advantages of the cheap ordinary rates are, *pro tanto*, illusory.

Secondly, the "Urgent" rate system renders the financial conditions on any particular route unstable, and puts a premium on inefficiency—that

is to say, that any route on which "urgent" calls are admitted becomes more and more profitable to the Administrations in proportion as they fail to provide sufficient plant to give a decent speed of service, because the consequent congestion of the traffic automatically increases the proportion of calls which the subscribers have to order and pay for as "Urgent" in order to get them through within a reasonable time. Moreover, the financial difficulties of an Administration struggling to provide a good service may be aggravated by the fact that, if it lays a new cable to relieve a congested route, as soon as the new cable is put into service, even if additional traffic is attracted by the faster service given, so that more calls are made, the total receipts may fall off heavily because the number of "Urgent" calls will suddenly decline.

I venture to think that the fundamental difference between the two systems tends to be rather exaggerated and is—at least in its most important aspect, i.e., in regard to speed of service—a matter more of theory than of practice. At all events, counsel has certainly been darkened by misunderstandings on both sides. In the first place, the figures of 30, 60 or 90 minutes delay mentioned by Mr. Gill, which were given advisory sanction by the C.C.I. two or three years ago, were intended only as absolute maxima; and, in fact, are now quite out of date, since nearly all the Administrations now provide a much better standard of service than this. In the second place, statistics of delay on the European international routes, which are published annually by the C.C.I., relate only to the busy hour; in spite of which I have seen them compared with figures of delay on American routes which are calculated over the whole day period, including the afternoon when, generally speaking, a much more rapid service is given—at all events in Europe. On the other hand, advocates of "Urgent" rates have very much exaggerated the point that the American system necessitates charging more for ordinary calls, because in comparing American and European rates reduced to a common gold currency, they have frequently failed to make any allowance for the fact that the purchasing power of gold in America is, generally speaking, substantially lower than in Europe. Moreover, if the proportion of "urgent" calls, even at triple rates (and some countries only charge double the ordinary rate), is to be, as Dr. Feyerabend contemplates for Germany, less than 3%, the additional receipts they bring in must be less than 6%, which does not seem to allow much scope for lowering the "ordinary" rate. It is certainly the case, speaking generally, that long-distance telephone service in America is both quicker and dearer than in Europe; it may do us in Europe no harm to exaggerate the American point of superiority, but I do not think it is good for us to overestimate our advantages in the matter of cheapness.

The whole question is much too difficult for me to venture to arrive at any conclusion; but I will state one significant fact. In the Anglo-Continental telephone services, there are no "urgent" rates but, on the other hand, a service without any delay in the busy hour is not regarded as economically practicable. A fairly rapid service is, however, given. For example, the busy-hour delay on calls from London to Paris is not more than 10-15 minutes and on calls from London to Berlin not more than 30-40 minutes. (Of course, in the afternoon hours and in the evening a much more rapid service is given.) Now on most of the Anglo-Continental routes rather more than half the calls are in the inward direction; i.e., are booked and paid for by Continental subscribers. This seems to me to be convincing evidence that a rapid "ordinary" service is financially practicable on the Continent of Europe as well as in England and America. I do not wish to suggest, however, that this is decisive on the vexed question of "urgent" rates.

Statistics.

A propos of statistical comparisons, I should like to mention one point about statistics generally. Statistics, although I have refrained from inflicting any on you in this paper, are, of course, absolutely fundamental in the administration of any telephone service, national or international. It is not too much to say that every decision taken by a telephone authority should be, not only defensible by means of, but based on reliable statistical evidence. I hope this is the case with the opinions I have expressed in this paper. It is, of course, impossible to deal here at all with telephone statistics, which is a subject in itself and of a very technical nature; but I think it is relevant to the general problem of international telephone administration that we in Europe have—in my belief—much to learn in the matter of statistics from America.

So far, I have dealt only with international telephony in Europe because, speaking generally, the first quarter of the 20th century has been the era in which telephonic communication between the industrial centres of population in the different European countries was established, organised and put on a firm basis. Much still remains to be done; and the next few years will certainly see substantial developments in the geographical scope of European international telephony, as well as a further marked improvement in the existing services, especially as regards the speed with which callers can get into oral touch with their foreign correspondents, and in general efficiency in matters of detail requiring standardisation. The ground-plan of a complete inter-European telephone system has, however, been laid and for some time to come progress, so far as I can see, is likely to be on existing lines and within the framework of the existing organisation.

Inter-Continental Telephony.

Two years ago, however, an event occurred which the Press described as "epoch-making" in the history of communications—in January, 1927, a public telephone service was first opened between the Old and the New Worlds. This beyond doubt marks the beginning of a new telephone era, the era of *inter-Continental* telephony. Since it was not at that time technically possible to construct and lay a transatlantic submarine cable capable of transmitting speech, it was necessary to resort to radio to form a link between the European and American telephone cable-networks. Four wireless stations were required (more are now in use), one each for transmission and reception on each side of the Atlantic; but for operating purposes these form only one transatlantic "route" terminating in the New York and London Trunk Exchanges, and up to date all calls between the two Continents are handled in those two exchanges. The very great difficulty of separating the free æther waves carrying the voices of the two speakers was surmounted after prolonged experiments by the device of very delicate voice-operated relays, by means of which the voices of the subscribers on each side of the Atlantic, as they are speaking, alternately switch the radio circuit into operation first in one direction and then in the other. The radio apparatus employed to provide the first circuit was long-wave and non-directional; the second circuit is short-wave and directional.

From the administrative point of view, the transatlantic service presented some exceptional features. First, only one circuit, capable of carrying a quite limited number of conversations a day, could at that time be provided; until technical developments made it possible to bring into use a second circuit the maximum amount of traffic between the two Continents which could be carried was, therefore, strictly limited. Secondly, the cost of providing and maintaining this one circuit was very high. Obviously, therefore, the rates charged at the outset had to be high. Thirdly, the circuit, though normally very efficient, was, like all radio circuits in the existing state of the science, liable to periodical disturbances or even complete interruptions, due to what broadcast receivers know as "atmospherics." This made it necessary, before a public service could be opened, to set up machinery for aiding the caller who was unlucky enough to strike a period of atmospherics in every possible way to get his call through—if not at the time, a little later when conditions improved—and also for making a rebate of part of the charge in cases where the call, though successful, was unduly prolonged owing to repetitions necessitated by transmission difficulty. The policy agreed upon by the American Telephone and Telegraph Company and the British Post Office and successfully followed is, while keeping a carefully detailed record of such difficulties (both for scientific purposes and as a check on the rebates allowed) to treat the public liberally.

The service was at first limited to the cities of London and New York and was only open for a few hours daily. Within a few weeks it was extended stage by stage until it covered the whole of Great Britain and the United States; and at the same time the daily hours of service were increased. Within a few months it became possible further to extend the transatlantic service to some of the capital cities of Europe and then to the other principal cities in the Continental countries having a good telephone network and connexion with London. These extensions are still going on, but a position has now been very nearly reached in which there is complete intercommunication between the European international telephone system, the organisation of which I have described, and the North American telephone network covering the whole of the United States and Eastern Canada and the chief towns in Western Canada, Cuba and Mexico; this intercommunication is wholly effected over the London-New York radio link. About a year after the service was opened, the possibility of bringing into service a second radio circuit came into sight and it was possible to lower the rates. There are now two London-New York circuits and others are being arranged for. In spite, however, of the fairly complete geographical scope of the service, it must, of course, be regarded as still in its infancy; obviously to meet the economic conditions quite a large number of circuits will ultimately be required. From the administrative point of view, therefore, inter-Continental telephony is still in the early engineering stage and the administrative problems which will be involved in handling large volumes of traffic have not yet arisen.

Future Organisation of Inter-Continental Telephony.

The day-to-day conduct of the inter-Continental service already presents, however, some problems of organisation which have been met by a working compromise adequate to the present stage of development. The American Telephone and Telegraph Company, which maintains a permanent technical representative in Europe, with an office in London, keeps by this means in daily contact with the British Post Office. The Post Office provides the administrative link as well as the physical link between the American telephone systems and the European Continental ones; while the American Telephone and Telegraph Company similarly links up the Canadian, Cuban and Mexican systems with Great Britain and so with the Continent of Europe. This works well, but I think the time will soon come when some more general organisation of inter-Continental telephony will be required. Experiments are being arranged for services between Great Britain and Australia, India and South Africa; there is also an experimental service in existence between Holland and the Dutch East Indies,* and a public service limited in certain respects) has just been opened between parts of Germany and Buenos Ayres. With the growth of these long links, which it may be possible sooner or later to connect up with each other, so as to provide a more or less complete inter-Continental telephone network, some kind of permanent co-ordinating machinery in matters of traffic and rating will be imperative. It is not at present quite clear whether the C.C.I. will be able to expand itself to the necessary degree or not. Its membership is not in theory confined to European countries; indeed, Japan and the Portuguese colony of Mozambique already belong to it, but to make it internationally representative under the new conditions the adherence in some form of the big American telephone systems

* A limited public service has since been opened.

would obviously be essential. It remains to be seen whether this can be secured.

The C.C.I., like most international committees, works by means of Rapporteurs who meet annually (sometimes more frequently) in the capacity of experts to prepare work for the annual meeting of the main Conference. There will obviously be considerable physical difficulties in bringing experts from different Continents into personal contact frequently enough to cope with all the current problems; but it is much too early to say how this difficulty when it arises could be got over.

I have mentioned that the C.C.I. Rapporteurs meet in the capacity of *experts* from a few of the more experienced countries, as contrasted with the representatives of the Administrations on the Advisory Committee itself, who (though, in fact, many of them are the same individual people) meet in the annual Conference of the Committee in the capacity of *delegates* from the respective Telephone Authorities. I suspect that an examination of the respective functions of experts and delegates might bring to light some of the general principles governing efficiency in international co-operation in public utilities. That, however, is a large subject; and I will only say here that I think it is to be hoped the organisation which will carry on world-telephony will select its Rapporteurs in accordance with the advice given, some two and a half centuries before the telephone was invented, by a British authority on administration—I am quoting from Bacon's Essay on "Counsel":—

> "In choice of committees for ripening business for the Council it is better to chuse indifferent" [i.e., impartial] "persons, than to make an indifferency by putting in those that are strong on both sides."

I want to thank several of my colleagues in the Post Office for help in collecting, translating and checking material for this paper.

REVIEWS.

"Source Books in the History of the Sciences." Gregory D. Walcott, General Editor. Published by the McGraw-Hill Book Company, Inc. Each volume price 20s. net.

This series will be welcomed by all those who take an interest in the stages by which the present mastery of man over nature in the various fields of science has been reached. Each volume contains a series of carefully selected extracts, translated into English, if necessary, from the original writings of the pioneers of some one branch of scientific work during the last 400 years, chosen as to give the reader a continuous view of the development of the science in question. It is deeply impressive to read the accounts of the various epoch-making discoveries in the very words of the men by whom they were made.

The subjects to be dealt with include Astronomy, Mathematics, Physics, Chemistry, Zoology, Geology, Anthropology, and Philosophy. Of these the volume on Astronomy has just been published, and that on Mathematics will follow shortly.

The volume on Astronomy, by reason of the intellectual revolution which astronomical discovery brought about, has an interest for the general reader as well as for the specialist in that subject. The selection of extracts for this volume has been made by Harlow Shapley, Ph.D., LL.D., Professor of Astronomy at Harvard University and Director of the Harvard Observatory, and Helen E. Howarth, A.B., A.M., Research Assistant at Harvard Observatory. The volume contains 412 + xvi pages. It is very well got up, with excellent paper and printing, and many good reproductions of illustrations and letterpress from the original works.

The most noteworthy sections are an extract from the book of Copernicus "De Revolutionibus Orbium Coelestium," in which he advances the theory that the earth is not the centre of the Universe, but that it moves round the sun; Kepler's account of his discovery of the laws of planetary motion; Galileo's description of his early telescopic discoveries; the portion of Newton's "Principia," dealing with the laws of motion and gravitation; Halley's work on comets; Maskelyne's weighing of the earth; Herschel's discovery of Uranus; Gauss' description of his method of least squares; Schwabes' discovery of the periodicity of Sunspots; Adam's discovery of Neptune; and Kelvin's theories as to the age of the earth. Many other extracts are given, and the whole collection forms a complete living record of the development of the subject, which is of absorbing interest.

We shall look forward to the appearance of the other volumes of the series.

"Pioneers of Wireless." By Ellison Hawks, F.R.A.S. Pp. xix + 304. With 24 Plates and 45 Diagrams. London: Methuen & Co. Ltd. Price 12s. 6d. net.

It seems at first somewhat surprising that in a historical survey of this subject half the book is completed before mention is made of the name of Clerk Maxwell, the name which is usually taken as the starting point in the history of radio communication. But Mr. Hawks is careful in his title, "Pioneers of Wireless," not Radio, which means that he must work through not only the pioneers of signalling by Hertzian waves, but also those who contributed to the various methods of electric signalling without wires, by means of conduction and induction. The work of these early pioneers is not nearly so well known as that of the later ones who dealt with the development of radio communication, and the author's interesting account of this early work will, for that reason, be welcomed by those who may feel a little disappointed that more space could not be assigned to the work of the purely radio pioneers.

Mr. Hawks is an old hand at presenting the romance of science in a way which will interest the layman and the expert alike, and so does he present it here. The present writer received the book for review when he was in full-blown occupation of the ante-influenza arm-chair. He felt depressed, and the sight of the book in no way cheered him. He glanced through the chapter headings, he nosed into the index and looked up a few points. That was enough; he started at the beginning and read to the end with great interest and enjoyment, and this was due to the author's presentation of old, and sometimes dry, facts in a humanly interesting light.

The first four chapters deal shortly with the great electrical pioneers from Gilbert to Faraday. The next seven chapters deal fully with the pioneers of conductive and inductive signalling without wires, from Sömmering to Preece, and it will interest Post Office readers to know that Preece's work is well described. Then follows an excellent chapter on the pioneer work of Hughes, which remained so long unhonoured and unknown. Then come three chapters on the great forerunners of Marconi, those whose work the inventive genius and indomitable will of Marconi advanced to a commercial basis. Marconi's early work is well considered in the next two chapters, and it seems then that the author feels that real pioneering is really over, as he finishes off with two chapters which deal very briefly, almost hurriedly, with a few of the later outstanding workers in radio communication.

The book is well produced, has a good index, and is greatly enhanced by photographic reproductions of all the great pioneers. It is a notable addition to the History of Wireless.

"The Practical Electrician's Pocket Book." Edited by F. H. Robinson. Published by "Electricity," 93 Long Acre, pp. 520. Price 2s. 6d.

This useful annual, started by the late Mr. Sidney Rentell and now in its thirty-first year, has again been revised, and while retaining many of its admirable features, has been entirely re-written. Besides special articles on different branches of electrical practice, it contains numerous tables of statistics, data, and useful memoranda. Industrial and domestic electricity, central stations, prime movers, wiring, transmission, electric tools, radio, telephony, and a host of other subjects are covered by this little book, which, as usual, forms a valuable work of reference.

COMMISSION OF ENQUIRY INTO THE ORGANISATION AND METHODS OF THE AMERICAN TELEGRAPH COMPANIES.

[NOTE.—All the articles in the series, "How to improve the Telegraph Service," which have appeared and are to appear in the *Journal*, were written prior to the publication of this Report.]

RECOMMENDATIONS.

I.

(*a*) *Apparatus.*

(1) Multiplex working should be replaced by teleprinter working on all routes on which it is possible and economical, by means of compositing or voice frequency to provide the requisite number of separate channels. On such multiplex circuits as are retained the channel speed should be not less than 50 words per minute, and type-keyboard and tape printing apparatus, capable of working at not less than 60 words a minute, should be universal. The number of arms should not normally exceed three.

(2) On automatic multiplex and teleprinter routes a considerably higher output than that on which the existing staffing standards are based should be required (*see also* (24) below.)

(3) The process of converting Morse circuits to teleprinter or telephone working should be carried further than has hitherto been contemplated. As a first step, every Morse circuit carrying as many as 200 messages a day at any time of the year should be scheduled for conversion to teleprinter working at the earliest possible date. Concentrator working with teleprinters should also be adopted as soon as practicable.

(4) A uniform type-keyboard should be adopted for all multiplex and teleprinter circuits in the inland service. All other types of keyboard should be replaced by the standard type as rapidly as possible.

(5) Adequate reserve apparatus should be provided at every office at which printing telegraph instruments are used. Morse and Wheatstone should cease to be regarded as stand-by apparatus for emergencies.

(6) The use of Wheatstone apparatus, whether for emergency purposes or for Press work, should be abandoned as soon as possible.

(7) Reception on all Morse and telephone circuits should be by typewriter at the larger offices, and Wheatstone slip should be transcribed by typewriter where Creed apparatus is not in use.

(8) Electrically operated timing stamps should be fitted at the receiving positions on multiplex circuits and the principal teleprinter circuits.

(*b*) *Lay-out.*

(9) Double tables with "V" belt conveyors should normally be provided in the larger instrument rooms; and whenever the phonogram equipment at a large office has to be replaced, the question of installing four-position panels, with two positions on each side of a double table with a belt conveyor, should be considered.

(10) The present type of circulation table should be abandoned at the largest offices, and the moving belt system in use at New York, Chicago, &c., should be introduced.

(11) All apparatus other than that actually required by the operators to enable them to dispose of telegrams should be removed from the instrument tables and accommodated in test rooms or other suitable positions. An exception should be made only in the case of multiplex distributors.

(12) All circuits worked by apparatus of the same type (multiplex teleprinter, Morse, Wheatstone) should be grouped together as far as possible

(*c*) *Maintenance.*

(13) Responsibility for the efficient working of circuits and for the control, adjustment and day-to-day maintenance of apparatus should be definitely vested in the traffic officers in charge of Instrument Rooms.

(14) All testing, regulating and maintenance work in the larger Instrument Rooms should be allotted to officers selected from the operating staff, who must possess the necessary technical knowledge and skill, and should receive an appropriate special allowance. The departmental technical examination, suitably revised, should serve as a qualifying test for these officers, and a scheme of training should be drawn up for those who qualify. The selected officers should normally be relieved of operating duties, but should be liable to be called on to perform them in case of need.

(15) The technical allowance, the additional increment granted to holders of the present Departmental technical certificate, and the allowance to Dirigeurs (who would disappear under recommendation (14)), should be abolished (subject in the case of the two former to the rights of existing holders).

(16) At the smaller offices the day-to-day maintenance should be carried out by the operators (*see* recommendation (22)) subject to periodical inspection by engineering staff.

(17) A life history of each apparatus unit, including a record of faults, adjustments and periodical overhauls, should be kept at every office.

(*d*) *Recruitment, Training, &c.*

(18) The number of offices at which Sorting Office and Instrument Room duties are performed by a common staff should be reduced to a minimum.

(19) At any office at which it is found possible to employ a separate staff for telegraph work, new female entrants on the telegraph side, other than those who will be required to do Morse work, should wherever possible specialise in one of two groups of Instrument Room duties: (1) printing telegraph and phonogram work, and (2) non-operating duties (excluding clerical work). The latter group of duties should be withdrawn gradually from the operating staff. Each new female entrant should receive only the training necessary for the group of duties on which she will be employed.

(20) No new entrant should be recruited for keyboard operating and phonogram work who is unable to pass prescribed digital, auditory and other tests.

(21) In order to ensure an adequate supply of male telegraphists who will be able to qualify for testing and regulating duties, the recruitment of male telegraphists by open competition should be resumed, a certain number of places remaining open to Boy Messengers, who should be required to pass a limited competition.

(22) The training of keyboard operators should be revised and improved, and the qualifying standard should be raised. In the case of operators at small offices with teleprinter circuits, the training should include instruction in the day-to-day maintenance of teleprinters.

(23) So far as possible each operator should specialise on a particular type of apparatus—Morse, teleprinter, multiplex or telephone—and training in Morse working should be confined to operators (including all male operators) who will be employed on Morse circuits. Rotation should be reduced to a minimum, and changes of duty should be allowed only between officers of approximately equal qualifications.

(24) So far as possible the most expert operators should be assigned to the most heavily loaded routes, both multiplex and teleprinter, and a special allowance should be granted for the higher output which should normally be obtained on those routes.

(25) Operators employed on duplex channels should send and receive alternately for periods of two hours.

(26) In addition to the authorised meal reliefs two regular rest reliefs of 15 minutes each should be allowed on any continuous duty of eight hours or more, and one on any continuous duty of less than eight hours. At the Central Telegraph Office, however, where the dinner relief is at present three-quarters of an hour, the dinner relief and rest reliefs should not exceed one hour in all on a duty of eight hours or less.

(27) Casual reliefs should be strictly limited to cases of real urgency.

(28) At the larger offices a time card should be used by each operator.

(*e*) *Supervision and Control.*

(29) In view of the greater concentration of traffic on channels working at high speeds, the size of supervising areas should be reduced in order to secure keener supervision and a higher output; it being understood that in future a more rigorous standard will be applied in the filling of supervising posts and promotion will be restricted to officers who are qualified to give fully effective supervision.

(30) The male supervising grades in Instrument Rooms should normally be recruited from the testing and regulating staff.

(31) A monitorial scheme should be introduced with a view to the detection and prevention of operating errors.

(32) A daily record of output at each circuit should be maintained, and these records should be carefully scrutinised by the responsible local officers, who should take suitable action wherever a low output is disclosed.

(33) A system of centralised supervision of the disposal of traffic over the principal routes should be introduced if the limited experiment already inaugurated proves successful.

(*f*) *Press Work.*

(34) Newspapers should be offered the facility of having special wires led into their offices for the direct receipt of reports of race meetings and other special events, the Post Office providing wires, teleprinter or Morse apparatus and operators for short periods on suitable terms.

(*g*) *Delivery.*

(35) In no case should a telegram for an address in a business area wait at the delivery stage for more than 5 minutes during the normal hours of business.

(36) Boy Messengers should be paid on the basis of distance covered, subject to a fixed minimum according to age, the walks being arranged so as to afford all the boys at an office as nearly as possible equal opportunities of adding to their earnings by increased effort.

II.

(37) Attractive leaflets or "folders" setting forth the usefulness of the telegraph system for speedy communication (both at home and abroad) should be available at Post Offices, and so far as possible in hotels, railway stations, &c. They should also be sent to telephone subscribers with their

accounts from time to time, and should be distributed from house to house in suitable localities. They should be as unofficial as possible in style, and should aim in particular at dispelling the popular idea that a telegram always brings bad news.

(38) The equipment of the larger public offices should include—in place of or in addition to the existing message stalls—a special glass-topped table, with chairs, for writing telegrams. The table should display the sign "Write your telegrams here" in attractive type and colour, and should be kept furnished with the different types of telegram forms and with serviceable pencils.

(39) The quality of the delivery forms and envelopes should be improved.

(40) The positions of telegraph offices should be more widely indicated by street signs, preferably illuminated.

(41) The facility of summoning a messenger by telephone to collect a telegram (inland or foreign) should be afforded in business districts and in developed residential areas.

(42) Large users of the inland telegraph service—in the first place holders of deposit accounts—should be visited periodically by canvassers, who should enquire as to any casue of dissatisfaction or as to the reason for diminished use of the service, and should make it clear that the Post Office is anxious to maintain contact with its customers and to satisfy their requirements.

(43) Large users should be given the name and telephone number of an officer at the local Head Office—where possible a canvasser—with whom to communicate in any case of difficulty or dissatisfaction.

(44) The convenience of the telephone for sending and receiving telegrams should be stressed by canvassers and by means of small adhesive labels attached to delivered telegram forms. The Night Telegraph Letter service should be similarly advertised where this facility is afforded.

(45) Special delivery forms and envelopes for telegrams conveying greetings at Christmas, Easter, birthdays, &c., should be designed, and appropriate formulæ for these occasions should be suggested (though not insisted on). These telegrams should be subject to the ordinary tariff and treatment.

January, 1929.

PAYING THE PENALTY FOR LOW TELEPHONE RATES.

THE Chicago journal *Telephony* gives an interesting instance of the control which State Railway Commissions have in America over corporations and companies authorised to carry on telephone business :—

"Nebraska has a Guaranty Fund Commission which takes over the management of crippled banks, collects and realizes on their assets and makes up any deficit so that all creditors are reimbursed. In the course of business the Commission has found itself in charge of merchandise stock, mills, markets and various other lines of industries which it was able to liquidate without much trouble—these concerns having been debtors to the banks taken over. . . . Finally the Commission took over a bank which had a claim against a small telephone company that had been operating under too low service rates. The company was losing money, and the Commission closed down the exchange without regard to the wishes of the subscribers or without consulting the State Railway Commission.

The telephone users affected made a prompt complaint, and the Railway Commission asked the Guaranty Fund Commission "How come ?" The latter said the answer was perfectly plain. The telephone company was losing money, the creditor bank could not afford to lose any more—hence, the finish.

The State Railway Commission at once served notice on the Guaranty Fund Commission that it must reopen the exchange and give service to the public, under the state utility law, or else defend an action in court. . . .

According to both the letter and spirit of the utility law, the Railway Commission is undoubtedly right in holding that the public must continue to have telephone service, regardless of the financial health of the company providing it. At least, that, having agreed to provide it, the company cannot quit without permission of the authority which permitted it to begin business."

There are reports nearly every week in the columns of *Telephony* of applications from small country telephone undertakings to Railway Commissions for permission to increase their rates. If the above-mentioned instance of the penalty for closing down an unprofitable exchange is typical, we should imagine that there was good reason for dealing sympathetically with the local companies' prayers.

The article "Broadcasting Developments" by Capt. P. P. Eckersley which appears in our List of Contents has been held over for revision.

CORRESPONDENCE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—A very heavy item in the Telegraph costs is the delivery of telegrams. Whether received by telegraph or telephone I take it, telegrams will always have to be delivered. The scheme I am about to submit may be revolutionary, but it is bound to come sooner or later.

Item 1.—Compel all subscribers to receive telegrams by phone. This might require a little diplomacy at first, but ultimately, with a little wise discretion, resisters would fall into line.

Item 2.—Appoint subscriber agents within well defined areas paying them a fee for delivery. These subscriber agents would pay the usual rentals for business or private installations, and be credited with the delivery fees in the accounts.

Item 3.—In outlying districts when the cost of delivery is heaviest, make it a condition in the contract that the nearest subscriber to the address must undertake to deliver telegrams.

Such subscribers to be charged a modified rental and paid delivery fees.

Item 4.—Where it is possible a line to each village or group of villages, if in close proximity, should be provided by the department on a commission basis.

Item 5.—Boy messengers only to be employed in populous areas where the number of telegrams warrants this means of delivery.

Under such a scheme it would be possible to reckon the actual cost of delivery of each message. I submit these proposals for discussion in your paper.

SMALL OFFICE.

P.O.A.C. HOME NURSING AND FIRST AID.

An interesting distribution of the awards gained by members of the staff of the Controller's Office during 1928, was made by the Controller, supported by Mr. Stirling, Miss Liddiard and Mr. Bold, in the Conference Room on Wednesday, Mar. 13 last.

The awards consisted of :—

Women (*Home Nursing*).	*Men* (*First Aid*).
4 Certificates.	4 Certificates.
1 Voucher.	5 Vouchers.
3 Pendants.	3 Medallions.
	1 Label.

The Controller, after reading the reports of both sections, referred to the feeling of uselessness one has in looking on in cases of accident or need where the bystander has not the necessary knowledge to be of assistance.

He also mentioned the old proverb, "A little knowledge is a dangerous thing"; but with this he coupled the saying, "Knowledge is power," and indicated that even where the knowledge is little, provided it is properly applied and its limits not exceeded, it can be of real power.

An appeal was also made for greater enthusiasm and activity.

Attention is therefore drawn to the local organisations which exist for the purpose of imparting this knowledge.

So far as the ladies are concerned, Miss C. M. Stephen (A.R.3A) would gladly give any information concerning the arrangements and lectures for Home Nursing, while for First Aid, all particulars will be willingly supplied by Mr. Sydney J. Smith, (A.O.3B).

If, therefore, any member of the Controller's Office is desirous of taking either of these interesting and useful subjects please do not fail to enquire of the above-mentioned local secretaries or of any member of the respective branches.

PRESENTATION TO MR. H. V. J. HARRIS, SOUTHAMPTON.

ADVANTAGE was taken of a break in the Conference of Telephone Supervising Officers which took place on Jan. 23 last to present Mr. H. V. J. Harris, Assistant Traffic Superintendent, with a handsome oak chiming clock on the occasion of his marriage, which took place three days later. Mr. O. G. Lee, District Manager, in making the presentation on behalf of the Staff, advocated in no uncertain way the "Married state," and wished Mr. Harris and the future Mrs. Harris a very happy future.

Mr. A. L. May, Traffic Superintendent, associated himself with the District Manager's remarks and on behalf of his colleagues in the Traffic Section he extended his very best wishes. Mr. Harris, in a short reply, thanked the District Manager and those present for the very acceptable gift and for their kind wishes.

Members of Postmasters' and the Sectional Engineers' Staffs associated themselves with the presentation.

EDUCATING THE PUBLIC IN AUTOMATICS.

THE success of an Automatic Telephone System depends very largely upon the manner in which the dialling operations are carried out by telephone users, and it is, therefore, necessary that all subscribers and as many members of the telephone public as possible, should be instructed in the use of the new system. It is the practice for every subscriber about to be changed to automatic working to be visited by an officer of the Instruction Staff, and to be given a personal demonstration on his own instrument by means of a demonstration unit installed at the new Exchange to which connexion is made through the Manual Exchange. In addition a model of the Automatic System is installed in each area about to be converted, and all subscribers and the general public in that area are invited to visit the set in order that the working of the new system may be demonstrated to them.

In London we have gone a step further than this during the past few months in our efforts to educate the public in automatics, and this has been done by giving demonstrations at suitable exhibitions. The first demonstrations of this kind were given at a business exhibition in the early part of last year, and the new departure was embarked upon as much in the nature of an experiment as anything else. The venture proved a success, however, not merely from the point of view of the large number of people who were present at the demonstrations, but owing to the fact that an appreciable amount of experience was gained as to the attitude of the general public towards the new system. During the demonstrations questions were encouraged, and in this way much information on all points relating to telephone matters in general were given and many erroneous ideas dispelled. As a result of this exhibition the model set was elaborated, and we are now able to demonstrate the working of the Director as well as the Strowger switches.

During the past 12 months this model apparatus has been installed at four Exhibitions, and by this means alone approximately 20,000 people have had definite instruction in the working of the automatic system. It has been responsible for some new business too.

W. H. M. W.

C. B. CLAY FOOTBALL CHALLENGE CUP.

THE final tie in the C. B. Clay Challenge Cup was played on the Tufnell Park Football Ground on Tuesday evening, April 16, between teams from the Post Office Stores Department (Holloway) and the Engineer-in-Chief's Office.

A good crowd of spectators turned up to see what proved to be a typical Cup Tie game between two very equally balanced sides. The Stores Department led at half-time by 2 goals (scored by W. Williams and A. Jones).

After the change-over the Engineer-in-Chief's Office pressed strongly and succeeded in equalising by means of goals by Hind and Granger. A most exciting finish then ensued. The Stores Department scored a third goal through Blower, and then Meridith, of the Engineer-in-Chief's Office, made the scores level again. Although both goals had many narrow escapes, full time arrived without further score and it was, therefore, necessary to play extra time. In the last 10 minutes, and as the shades of night were falling, the Engineer-in-Chief's Office managed to elude the Stores Department's defence, Meridith and Larkham scoring goals, so the Engineer-in-Chief's Office became the holders of the Cup after what was agreed by all present to be one of the most exciting contests they had seen.

Col. C. B. Clay, the donor of the Cup, was unfortunately unable to be present owing to an attack of ptomaine poisoning, and in his absence the presentation of the cup, together with miniature cups to each member of the winning team was made by Mr. H. Sparks, O.B.E., the Controller of Stores. Mr. Sparks paid a tribute to both teams for the excellent game they had played and also said he was sure all present would wish Col. Clay a speedy return to good health.

It may interest readers of the *Journal* to know that this Football Challenge Cup was first instituted in 1898, and is still open to all teams representing the staff of any branch or section of the Post Office associated with the Telephone Service in London, including the following departments :—

The Secretary's Office.
The London Telephone Service.
The Post Office Stores Department.
The London Engineering District.
The Office of the Engineer-in-Chief.

Entries for the competition are cordially invited, and particulars can be obtained from the Hon. Secretary, Mr. C. J. Head (London Engineering District), Mr. A. E. Wild (London Telephone Service), or Mr. F. Woollard (Engineer-in-Chief's Office).

The proceeds of all matches are devoted entirely to charity, and the competition has been the means of raising over £200 during the past two two or three years.

G. V. DOWDING.

BY W. T. L. (OF THE C.T.O.).

BY the time these lines appear in print the wireless synchroniser—which will enable those people fortunate enough to possess both wireless and amateur cinematograph apparatus simultaneously to hear and see broadcast plays, &c.—may be on the market, the B.B.C. at the time of writing carrying out exhaustive tests. From what I hear the apparatus is simplicity itself, and when adjusted ready for use, the announcer will quote a number corresponding to that of a particular film, which will be a pictorial reproduction of the item about to be broadcast.

Even in the C.T.O. there are many who fail to recognise in the name of the inventor a one-time colleague.

It cannot be as long as ten years since George Dowding, as we knew him then, showed his application for resignation to the writer, on which he stated that his reasons for leaving were "private." That was characteristic of him. Modest to a degree, G. V. D. gave one the impression that his abilities were very limited.

At that period the only "wireless" periodical on the market was the *Wireless World*, but the public wanted something a little more picturesque, and not quite so technical; and here our old friend showed us that he could see a little further than his nose, for that bright little journal, *Popular Wireless*, owes its existence to him. He was the originator of the book, and when it was but a few weeks old George bid good-bye to officialdom and departed for the Street of Adventure, as Assistant Technical Editor of the then new publication. It is now some time since he was promoted to the position of Technical Editor.

For some time prior to his resignation our brilliant subject showed considerable ability as the writer of a number of articles on the subject of wireless that were published in the Press. He cannot be much more than in the early thirties at the present day, and, it is understood, can claim more than a nodding acquaintance with that famous scientist of occult and earthly mystery—Sir Oliver Lodge.

Yet another name added to the long list of genii that have sat on official chairs by our side.

STAFF HOSPITAL COLLECTIONS—LONDON.

THE Annual General Meeting of the Post Office Telephone Staff Hospital Collections (associated with the Hospital Saturday Fund), was held on Wednesday, Feb. 13.

Mr. Valentine, the Chairman, reviewed the position of the Fund for some years past and showed how the contributions had grown from comparatively small beginnings until they had now reached the large sum of £2,422 11*s.* 6*d.* last year. He expressed the hope that the desire of the Secretaries to reach the sum of £2,500 would be reached this year, and in congratulating them on the work that they had performed, he also expressed the view that their desire would be attained. He said how much he admired the unbounded generosity of the Exchange Staffs, not only in connexion with the Hospital Saturday Fund but in many other directions.

The report of the year's work was presented by Miss Reekie, one of the Secretaries, who intimated that the Committee were delighted with the response to the Fund, and pointed out that this year's collections were larger than last year, although the hoped for £2,500 had not yet been obtained. The number of benefits issued by the Fund had increased and all sections of the staff had benefited from the Fund.

It is hoped that the interest of the staff in the Hospital Saturday Fund will be further stimulated this year, and that not only will £2,500 be collected, but that high tide will be reached at a far larger amount. So collectors, do your best!

TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—According to the *Electrician*, the Wireless Branch of the Commonwealth Postmaster-General's Department, there were at the end of September last about 300,000 licensed listeners in Australia. The Postal Department, too, has accepted a tender for the introduction of a service of telegraph transmission of pictures between Melbourne and Sydney. It is expected that the service will be available for public use by the present month. The contract has been let to the British General Electric Co., Ltd., the patent rights of the transmitting plant being by a German company, Siemens & Halske. The British General Electric Co. acted as agent for the German company. Two other tenders, says *The Electrical Review*, were received, one from an American telephone company, and the other from a Melbourne firm, which has been formed to experiment with and exploit the transmission of pictures.

AUSTRIA.—Herr Oskar Czeija, general manager of the Austrian Broadcasting Company, recently drew the attention of members of the Vienna Scientific Club to the ambitious goal which the constructors of the Zoffen station had set themselves—the transmission of a programme which could be received at any point on the earth's surface, says *The Times*. The Dutch station at Huizen was nightly entertaining Dutchmen in the Dutch Indies. The broadcasting experimental department at the Academy of Music in Berlin was groping after an art peculiar to "broadcasting" in which exponents would be specially trained. On the technical side effort was everywhere concentrated on the construction of a receiving set with automatic, highly selective powers, which on the mere pressure of a button would instantly adjust itself to any desired wavelength.

CANADA.—The Canadian Royal Commission returned to Canada last month to confer with the provincial authorities. The Commission, which consists of Sir John Aird, as president, Mr. Charles Bowman, and Dr. August Frigon, spent a month in London in consultation with the B.B.C., and has visited the main Continental centres. The Commissioners are hopeful that, by the time a chain of powerful stations is built across Canada, it will be possible to arrange for a regular weekly programme of British broadcasting for Canadian listeners.

Canada's first automatic wireless beacon was inaugurated on April 6 on Seal Island, off Nova Scotia. It is the first of a chain of seventeen beacons stretching from the Gulf of St. Lawrence to the Great Lakes.

The new list of radio stations shows two new stations. One is CJRX, 25.6 metres, 2 kw., which broadcasts simultaneously with another station owned by the same company at Fleming, Sask. (CJRW—296.9 metres). In connexion with the change of CKY, at Winnipeg, from 0.5 kw. to 5 kw., CKX has been opened at Brandon, Man., with the old station that used to be CKY. There are now 78 broadcasting licences in the Dominion, not all of which are in use.

CZECHO-SLOVAKIA.—An International Wireless Conference opened at Prague on April 4. Delegates of 27 European and three non-European telegraph administrations attended, of eight telegraph companies, the International Union of Wireless Telegraphy and the International Committee of Aeronautics. A discussion took place on the Wireless Telephony Committee on the Czecho-Slovak proposals recommending the so-called "Brussels plan" as the basis for the distribution of "radiophonic waves" and co-operation between the World Telegraph Union of Berne and the Wireless Telephone Union of Geneva. A modification of the Brussels Plan known as the Prague Plan was unanimously adopted.

DUTCH EAST INDIES.—The British Commercial Agent at Batavia (Mr. H. A. N. Bluett) has prepared a very interesting report on the economic conditions in the Dutch East Indies. From a mine of useful information the following is selected as indicative of the possibilities of a market for radio apparatus in the not too distant future :—

"Considerable development," says the Agent, "has taken place in radiotelegraphy, and there is now direct communication with Holland, Germany, France, the United States, French Indo-China and Manila. Greater efficiency has been attained by a more extensive application of the short-wave system and automatic reception. Experiments with radio-telephony have been made, and although considerable difficulties have still to be overcome, it may be expected that the Post and Telegraph Service will shortly inaugurate a public service. So far no progress has been made in the formation of a local broadcasting company, though it may be anticipated that a concession for radio broadcasting will be granted soon."

FRANCE.—*News by Wireless but three hours late!*—Reuter's Paris correspondent reports that the Bill which is shortly to come before the French Parliament, defining the rights and conditions of broadcasting, will raise the question of the censorship of programmes. Two suggestions will be put forward, one emanating from Mr. Francois-Poncet before he was appointed Under Secretary of State for Fine Arts, and the other from the Government. Objection is being taken to the Government's proposal, which would delay most news by three hours.

The Eiffel Tower wireless station, which for six years has been worked on a wavelength of 2,650 metres, is apparently still undergoing readjustment for 1,465 metres, says *The Electrical Review*. This wavelength has been chosen to obviate the difficulty of the Eiffel Tower swamping Daventry and Radio-Paris, but very delicate adjustment will be required to prevent interference with the Paris airport of Le Bourget, where specially selective apparatus is to be installed.

For some time past, says the same authority, an autographic telegraph service has been in operation between Paris, Lyons, Strasburg, Marseilles, Nice and Bordeaux, by means of which telegraph messages are transmitted in the handwriting of the senders. Hitherto such messages have had to be written with a special syrupy ink, but as the result of improvements recently effected by Mr. Belin, they can now be written with ordinary ink, or even typewritten.

GERMANY.—The Funk-Stunde, Berlin, has sold the Voxhaus in the Potsdamer Strasse, where the company has had its studios and offices since its foundation in 1923, and has acquired land on which it is intended to construct a new Funkhaus for the Berlin stations. It is hoped to begin work on the new building this summer, and to complete it by the end of 1930. The new headquarters will contain the offices and studios of the Funk-Stunde and Deutsche Welle, G.m.b.H. (the company controlling the Deutschlandsender at Königswusterhausen), and the offices of the Reichs-Rundfunk-Gesellschaft and Reichs Broadcasting Commissioner. There will be several large studios, and room has also been provided in the plan for a broadcasting museum. The site is quite near the Radio Exhibition Halls at Witzleben.

The German Atlantic Telegraph Co. recommends the payment of a dividend of 7%, as for 1927. The traffic is reported to have further increased, especially on the line between Emden, the Azores and New York. The question of the laying of another cable between Emden and the Azores is under consideration.

GREAT BRITAIN.—The B.B.C. announces that the address of the north regional studios and offices are Broadcasting House, Piccadilly, Manchester. The old accommodation at Orme Buildings has been vacated, and the first programme from the new premises was broadcast on April 8. The new premises are situated on the north side of Piccadilly, overlooking the municipal gardens.

Fultograph Progress.—In view of improved processes in transmission, the B.B.C. has adjusted the times and stations allotted for picture transmissions outside programme hours as follows: *Afternoon transmissions*—station 5XX from 2 to 2.25 p.m. on Tuesdays and Thursdays. *Night transmissions*: stations 2LO and 5XX from midnight to 12.15 a.m. on Mondays and Fridays; and station 5GB from 11.15 to 11.45 p.m. on Wednesdays and Saturdays.

The daily weather charts are also to be transmitted by wireless, according to Mr. R. A. Watson Watt, Superintendent of the radio research station at Slough, in the course of a lecture delivered by him before the Royal Meteorological Society on "Weather and Wireless."

According to the *Financial News*, Mr. Watt said that experimental transmissions would be made from Daventry by the Fultograph system. Wireless as a means of communication, the lecturer went on to say, was essential in modern meteorology, because it alone was capable of giving sufficiently rapid interchanges of data over wide areas.

HOLLAND.—Reuter's Hague agency reports that the first conference of the International Consultative Technical Committee of Wireless Communications will take place at The Hague at the end of September, and will probably last ten days.

HUNGARY.—Reuter announces from Prague that Hungary will participate in future in the fortnightly exchange of programmes between the countries of Central Europe. International broadcasts have been given regularly by Germany, Austria, Czecho-Slovakia, and Poland, since June 11, 1928, when the first relay was made by Berlin to Vienna, Prague and Warsaw.

INDIA.—The Indian correspondent of *The Electrical Review* informs us that the trading branch of the Indian Radio Telegraph was not satisfactory during its first complete year's operations. Side by side with this comes, through the medium of the London *Times*, the report of the Indian Broadcasting Co. for the past year, which shows a loss of two lakhs 15,000 rupees (£16,125), the total loss sustained by the company to date being three lakhs 82,000 rupees (£28,650). The directors consider that the loss would have been much less but for two important disabilities from which the company suffers. In spite of the prosecutions undertaken by the Government of persons found possessing receiving sets without licences, there is still much piracy which deprives the company of legitimate revenue. The company is also unable to collect all the amounts due as a 10% tax on wireless imports, and, according to *The Times*, it is negotiating with the Government over means to cover up loopholes through which such losses occur.

On the other hand, the same correspondent of our company also reports that the first complete year's operation of the beam telegraph service introduced by the Indian Radio Telegraph Co. has resulted in a gross profit of Rs. 10,18,000. After making provision for depreciation and reserve, total dividends of 10% on ordinary shares and 4% on deferred shares have been declared. From the date the service was inaugurated, the company handled a much greater volume of traffic than was anticipated. The staff was therefore augmented and put into a much better position for dealing with the requirements of the service in all its branches. A significant feature of the increased traffic is the large proportion of "full rate" messages, almost all of which are sent in code. This particular feature is the best evidence that the accuracy

and speed of the service are meeting the requirements of the public. There has also been a marked increase during the year in the cheaper classes of traffic, and in this direction the company looks for great expansion of the existing Anglo-Indian circuit. During the past year, in co-operation with the Government of India and the British Post Office, the company extended the facilities for "daily letter telegrams" and "week-end letter telegrams" to many countries.

The company's service still suffers from the handicap of the absence of its own land lines between Bombay, Calcutta and the other large commercial centres in India. Negotiations are in progress with the Government of India, and if certain proposals which have been made are adopted, this state of affairs may soon be remedied.

The extension of the present wireless service to other countries is engaging the attention of the company's board, and the Government of India has assured the company of its support and has promised sympathetic consideration of any developments of this nature. It is also known that the establishment of a system of wireless telephony between India and Great Britain, utilising the beam for that purpose, would meet with the approval of the Government of India.

ITALY.—Plans for the erection of a receiving and transmitting wireless station at the Vatican City in Rome have been agreed upon.

JUGO-SLAVIA.—The new broadcasting transmitter at Belgrade, a Marconi 9-kw. installation, having satisfactorily completed its tests, was officially opened on Mar. 24. The transmitting station is in the centre of Belgrade, in the Academy of Sciences, and three studios will be used in the production of the programmes. The aerial is suspended between masts approximately 80 feet high which have been erected on the top of the building, and the transmitter works on a wavelength of 452 metres with an aerial energy of about 2 kw.

SWEDEN.—Reuter's Trade Service informs us from Stockholm that the Swedish Telegraph Board has given the Marconi Company, of London, an order for equipment for a new 60-kw. broadcasting station near Stockholm. The cost of the equipment will be about Kr. 400,000, and delivery is to be made next November.

SWITZERLAND.—From Geneva we learn that the Committee of the League of Nations on Communications and Transit has adopted the reports of the Special Committee of Press Experts regarding telegraph and telephone facilities for the Press which are to be considered by the Telegraph Conference in 1930. The Committee further endorsed the recommendation of the Press Experts' Conference regarding greater facilities for communication by wire and wireless between Europe and Eastern countries and North and South America.

U.S.A.—*More Radio Problems!*—The Court of Appeals of the District of Columbia has delivered a judgment which is likely to cause the Federal Radio Commission serious embarrassment in future. Station WGY (Schenectady), operated by the General Electric Co., took legal action against the Commission when it refused to renew the station's broadcasting licence on a full-time basis. The Commission was obliged, by the equalising requirement of the Davis amendment to the Radio Act, to curtail the time allotted to one or other of the powerful stations operating in Columbia, and the appellate court which heard the appeal ruled that curtailment of the Schenectady station's time was not justified.

This is the first decision of the kind made by an appellate court designated in the Radio Act to settle disputes. Its importance is the fact that henceforth the ruling of the Radio Commission on any station's comparative utility is legally open to serious challenge, and unless it appeals successfully to the Supreme Court of the United States against the judgment it is likely that other stations will begin legal action against its rulings.

Labour's Own Broadcasting Station!—Station WCFL in Chicago has been added to the National Broadcasting Company's system. It is the only important broadcasting station in America that is controlled by labour organisations, being owned and operated by the Chicago Federation of Labour and supported by the American Federation of Labour, and subscriptions from the thousands of members of organised labour. It has a power of 15 kw., and operates at a frequency of 970 kh (309.1 metres). It recently received a permit from the Federal Radio Commission for a 50 kw. transmitter.

Coincident with the announcement that it is now on a self-supporting basis, the National Broadcasting Company added four southern stations to its coast-to-coast network, which forms the largest group of associated radio stations in the world. The four stations are: WSMB, in New Orleans; WAPI, in Birmingham (Ala.); KTHS, in Hot Springs; and WIOD, in Miami Beach.

It is estimated that there are now over 1,200 factories in the United States devoted exclusively to the production of radio sets and accessories and that 320,000 people are engaged in the industry.

GENERAL AND PERSONAL.—*Parliamentary notes and queries.*—On Mar. 19, Mr. Scrymgeour asked the Postmaster-General if his attention had been called to the fact that during the recent fire at Llandudno post office a Post Office engineer prevented a fireman from spraying the switchboard with water, "thus averting serious explosions," and if he would state what steps were taken to avoid such a possibility occurring in offices having a large amount of electrical gear.

Sir W. Mitchell-Thomson said that the Post Office engineer prevented the fire brigade from spraying the power plant with water in order to minimise damage, but there was no risk of an explosion. At all telephone exchanges of comparable size, engineers were continuously in attendance.

The Bill promoted by the Pacific Cable Board to protect the pension rights of the staff was passed for second reading in the House of Commons on Mar. 25. Mr. A. M. Samuel, Financial Secretary to the Treasury, said the terms had been settled by the Communications Company. The partner Governments were parties to them, and until the Government received their reply it was not in his power to state those terms.

Contracts and Companies.—South African Railways and Harbours, May 16.—Supply and installation of electric signalling apparatus at Johannesburg. (Reference B.X. 5,165.) Postmaster-General's Department, Melbourne. May 28—Supply of telephone jacks and number plates (Schedule C. 417). (Reference B.X. 5,202.) Department of Posts and Telegraphs, Pretoria. May 30—Supply of telegraph materials, tubular arms, crossheads, bases, &c. (A.X. 7,767.)

N.B.—The references between brackets are those to be used when applying to the D.O.T., for particulars, &c.

The directors of the Postal Telegraph and Cable Corporation have declared a quarterly dividend of 1¾% on the 7% non-cumulative preferred stock, payable April 1.

The Eastern Telegraph Co. Ltd. have paid a dividend of 2½% to end of quarter Dec. 31, 1928, and the Eastern Extension a final dividend for 1928 of five shillings. In the case of each company this is free of tax.

The Direct Spanish Telegraph Co., Ltd., again paid 10% free of tax for 1928.

Local Items.—The following list of promotions in the Cable Room is the longest it has been my pleasure ever to have recorded in these columns, that is to say, over a period of nearly 15 years. To one and all then the sincerest felicitations to a group of men each one of whom has well-earned the confidence of the Department: Messrs. E. E. Street, R. F. Dollin, A. B. H. Brown, J. P. Fox, and A. O. Batten promoted to Assistant Superintendents, and Messrs. W. C. Hughes, F. Land, H. Moore, A. W. Pepper, F. T. Skinner, H. Savage, W. H. King, F. A. Randall, W. H. Evans, S. Doran, W. T. Craven, A. Bath, J. F. Smith, Sr., W. E. Tutt, D. D. Deadman, E. R. Widgery, H. Champ, T. H. Motton, G. W. Foley, G. Collins, W. T. Moon, W. H. Bird, R. Rennie, A. E. H. Skinner, W. J. Henn, and P. W. P. Hemmens, all to Overseer rank. To these must be added one provisional appointment to each of the above classes to Messrs. H. A. Hodgson and A. E. Millett, to whom also one's optimism permits itself to offer similar congratulations.

Obituaries.—With deep regret the following are recorded, and the sincerest sympathy proferred to the bereaved relatives: Mr. W. M. Mason who entered T.S. in 1871 and for many years onwards was attached to the old "Stock" office, passed away at St. Leonards-on-Sea on Mar. 21. He retired in 1918 then holding the rank of Asst. Supt. II.

Mr. T. F. Bennett, who died from heart failure on April 3 in his sixty-ninth year, entered the Telegraph Service in 1876 was promoted Overseer and Senior Telegraphist 1898, and Asst. Supt. 1907, leaving the Service upon reaching the age-limit in 1920. He was of a retiring disposition but earned the affection of all those who knew him intimately inside or outside his office duties. Writes one of these, "he was always of a very unobtrusive character during the whole of his long official life and service, while it is pleasant to record that he appears never to have made a single enemy."

Retirements.—Mr. J. G. Smith, Overseer of the Cable Room—yet another of the diminishing band of employees who were transferred to the Post Office with the merging of the Submarine Telegraph Company's business in 1889, retired upon reaching the age-limit during the last week of March last.

Temperaments and circumstances differ, and thus not to all is it possible to leave behind so real and so many genuine regrets at saying goodbye to a supervising officer and a real colleague, as was the case with Mr. Smith. Uncompromising in his integrity and his convictions, "Jakob" Smith had never been known to "let anyone down." He is not likely to forget his send-off of Mar. 29 1929.

The Optimism of youth and age.—For your young men shall see visions and your old men dream dreams.—*Joel.* J. J. T.

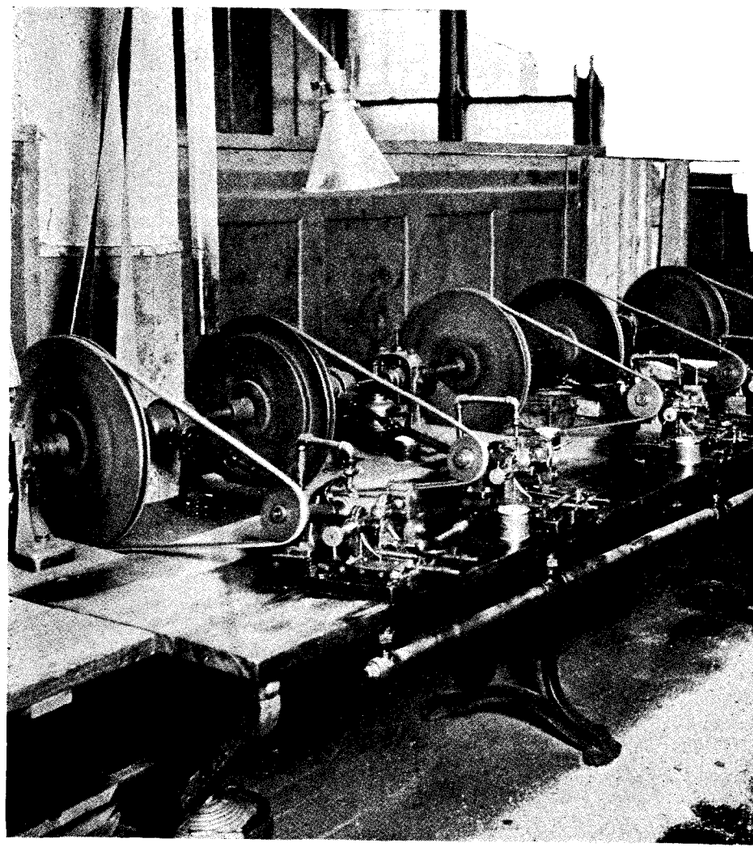
ST. ALBANS DISTRICT NOTES.

ON Friday, Mar. 8, a Whist Drive and Dance was held at the Faulkener Memorial Hall by the District Office staff. A very enjoyable evening was spent by all present, which included Mr. J. H. Wilson, District Manager, Mr. A. J. Sharpley, Sectional Engineer, Capt. H. E. Parry, Traffic Superintendent, and Mr. H. C. Sampson, Head Postmaster of St. Albans. Representatives from several exchanges in the district were also amongst the company. A vote of thanks to Mrs. Sharpley, who kindly presented the prizes, was voiced by Mr. Wilson, and the touches of humour in his brief speech, and that of Mr. Sharpley, who replied, caused much amusement.

The duties of M.C. for the evening were ably carried out by Mr. S. H. Croft, Assistant Traffic Superintendent, whilst the arrangements for refreshments—an important feature of such functions—were in the capable hands of Miss H. E. Murfitt, Travelling Supervisor.

Maintaining Strowger Automatic Supremacy—

Specially Designed Machines for Special Purposes



The seven worm-cutting machines shown here are automatic in operation. They require the attention of but one workman, who merely inserts the pieces to be machined, and removes them at the completion of the operation. In spite of their high speed operation, these machines cut the governor worm with an exceptionally high degree of precision and accuracy.

THE Type 24 dial developed by Automatic Electric Inc. has established new records of endurance and reliability, far surpassing anything heretofore produced. Among the several reasons for this dial's remarkable durability, one of the most important is the high grade of fine machine work which is done on its various component parts. The governor worm particularly requires workmanship of the highest order in its manufacture.

To cut this governor worm with the required precision and accuracy, it was necessary to design special machines some of which are shown in the accompanying illustration. They are but a small portion of the large number of machines throughout the factories of Automatic Electric Inc., which have been specially designed and constructed to fill some specific function in the manufacturing process, which cannot be satisfactorily accomplished with standard tools and machinery. The correct design and satisfactory operation of these machines have been made possible by the years of experience which Automatic Electric Inc. has had in manufacturing Strowger Automatic equipment.

[*This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.*]

Automatic Electric Inc.

Factory and General Offices: 1033 W. Van Buren St., Chicago, U. S. A.

Sales and Service Offices in All Principal Cities

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STROWGER AUTOMATIC

The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. MAY, 1929. No. 170.

CALL OFFICE DEVELOPMENT.

A BRANCH of telephone development to which attention may be drawn is the growth of the call office system. There are at present 25,767 call office stations in this country, a number actually equal to the total number of subscribers' stations in the British Isles in the year of Queen Victoria's jubilee. There is no doubt that the multiplication of call offices and especially kiosks in conspicuous and convenient places adds greatly to the general usefulness of the telephone service, and affords useful propaganda work by inculcating the telephone habit in the public. The number of kiosks increased in 1928 from 4,196 to 6,201, of which latter number 1,214 were in London.

The extension of the rural call office system which has of late received a good deal of public attention, is an interesting but more complex feature of telephone development. To extend this convenience to remote and sparsely populated villages which are unlikely to make even 4 calls a day, however urgent their need of rapid communication without the outside world may be, is an economic problem which only a national system not conditioned entirely by questions of profit-earning can adequately handle. The lay mind seldom realises the large outlay of capital and annual maintenance charges required to carry a telephone line to a distant village, and to provide daily service, and how difficult it is to cover these costs by the returns from a few calls per day. It is gratifying to know that the number of rural call offices has increased from 5,804 in 1924 to 7,989 in 1928, and the telephones in rural railway stations has risen from 480 to 1,036 in the same period. The new Budget proposals, as most of our readers are aware, foreshadows a scheme for equipping five-sixths of existing village post offices and rural railway stations not so equipped, with public telephone service in the near future. This will go far towards fulfilling a long-standing requirement in rural districts. The call office question is one which makes its strongest appeal to the steadily diminishing body of citizens who are not telephone subscribers; and to those to whom the call-box is the only means of participating in the most rapid and personal form of modern communication it is a matter of great moment.

HIC ET UBIQUE.

THE Anglo-Continental telephone service continues to spread eastward. On April 17 public service was opened between this country and the south-western parts of Finland, including Helsingfors and Abo. The charge for a day call of 3 minutes' duration is 21*s*.

During last month the transatlantic service was extended to Gibraltar and Ceuta on the Northern coast of Africa. It is thus now possible to speak from America to Africa via London.

It is reported that service was opened on April 2 between Hungary and Rumania. This is a step towards placing the Balkan countries in telephonic communication with central and western Europe.

Telephone operators may take on a new pride in their profession. Not only do they carry on an indispensable public service, but it is also claimed for them by Mr. Bernard Shaw that they are serving to keep alight the torch of articulate English. He is reported to have said:

"People drop their vowels and syllables and everything else, and at the present time they just make a noise. How on earth they make themselves understood to each other is difficult to know.

"It is pure laziness, but the language, fortunately, is being preserved by telephone operators and wireless announcers, who have to be distinct and articulate. When the language is dead to all intents and purposes it will survive in this way.

"The country districts are learning a good deal in this way, and even, in time, actors will begin to speak intelligibly through this means."

According to the *Nottingham Evening Post* an important firm of merchants in the City, doing a large continental business, has just sent a letter to all its foreign connexions suggesting that in future all polite comments on the goodness of the morning, and on the weather, should be eliminated from trunk telephone conversations. They had calculated that with a trunk telephone bill of £10,000 a quarter, "Good mornings" and inquiries after the health of other members of the firm cost them over £2,000 a year.

It frequently happened that the Hamburg or Rotterdam line would be used in succession by three members of the firm, and that each in turn would start his conversation by nearly a minute's comment on weather conditions. In these circumstances a little rain in Rotterdam was much too expensive.

The Copenhagen Telephone Company, says Reuter, has contracted with the Guaranty Trust Company of New York for a 25-years 5% loan of $7,000,000 (about £1,400,000).

The loan will be issued in New York in a few days' time at a price of 94¾%.

The Odyssey of a Joke! In our issue of June last year we retailed a joke from a Glasgow paper, which had it from New York, about a Chicago telephone subscriber in New York complaining to a New Yorker of the telephone service and averring that in Chicago he could be put through quicker to H—l. "Yes," retorted the New Yorker, "but that's within the city limits!" The paragraph was copied in October by a Berlin paper, which evidently thought that H—l stood for an actual suburb of Chicago, and the joke was entirely lost in the translation. The translator represented the Chicago subscriber as saying that the call would have been completed much more quickly at home. "Yes," came the smart retort, "but that is only local service!" By February this year the German version of the joke had reached a telephone journal in Buenos Aires, which after making due acknowledgment to the *Glasgow Herald*, to the Journal, and to its German source, translated it into Spanish, still, of course, without any reference to the nether regions. Thus the joke which left New York early in 1928, travelling via Glasgow, London, and Berlin, finally returned to the New World in February 1929 in Spanish dress and minus its point!

A writer in the *Sheffield Weekly Telegraph* pretends that he overheard two telephonists chatting. Both were going to a party on the following Saturday, and they were discussing what they would wear. I listened to them for about ten minutes while they discussed their dresses, and, getting impatient, I tapped the receiver. "Are you there?" I cried. "Are you there? Hallo, hallo! Who is that speaking?" Then one of the girls addressed me. "What line do you think you're on?" she demanded indignantly. "I'm not exactly sure," I answered, "but, from all I've just heard, I think I must have got on the clothes line." This is really an embroidered version of an older story of a subscriber who gets a cross-connexion on a line over which two ladies are discussing dress. "What line do you think you are on?" asks one, angrily, as he bursts in. The rest is as above.

We have recently seen a copy of the *Post and Telegraph Review* of Manila. Amongst postal and telegraph matter are interspersed social and personal articles of an infinite variety, such as hints on what foods may be eaten with a spoon, on personal cleanliness, and on thrift. The Thrift campaign went so far as to embrace stamping on domestic letters: "Do not imitate the rich; live within your income." This ambiguous "slogan" seems to have caused some irritation to the rich of Manila, two of whom protested. After offering an apology the director of Posts states that "the thrift precepts in question were primarily intended for the poorer or laboring class and the younger generation," and that it was impossible to differentiate when stamping domestic mail matter. So we assume the rich are still being told by implication that they don't live within their income.

The principle of charging for each minute after the first 3 minutes at one-third of the 3-minute charge, instead of making the caller pay for a second 3-minute period, is being extended to the Inland Trunk Service on May 1. The new system, which will apply to all calls for distances of over 35 miles, is already familiar to users of the Anglo-Continental and Transatlantic Telephone Services in which it has been in force for over two years.

The caller will not, as heretofore, be specifically asked at the end of each 3-minute period if he wishes to extend the call. The operator will merely enter the circuit as nearly as possible at the end of the 3-minute periods and announce "3 minutes," "6 minutes," &c. The call will not be otherwise interrupted.

We have an enquiry from America for a bound set of volumes of the old *National Telephone Journal*. As we believe some of our readers possess such sets we shall be glad to hear if anyone wishes to dispose of them, and if so, at what price?

RHAPSODY

INSPIRED BY HEARING IN A VILLAGE INN A DISCUSSION AS TO THE PRONUNCIATION OF AN ENTRY IN THE LOCAL TELEPHONE DIRECTORY.

I. In the telephone book there are exquisite titles
That ring like the song of the heavenly Muses:
They enrapture the spirit, and nourish the vitals
With the influence rare that their melody oozes.
Now soft as the lute, and now loud as the organ,
Now majestic* and pure as the harp of the Jews is,
They would charm the Chimera, and soften the Gorgon,
And wean *the poor Yank from wood-alcohol boozes.*
But though they be lusciously rapture-compelling,
The phrase that Apollo for primacy chooses
Is the entry delicious, all others excelling,
Of Morgan and Mooney, the Misses, Massoozes.

II. Sweet balm for the spirit by trouble encumbered
The Ode to a Nightingale softly induces:
And happy the heart that has mused or has slumbered
To the sound of a rivulet lapping its sluices.
To *the nose of the gourmet*, how nobly enthralling
The stuffing enshrined in a Michaelmas goose is;
To maidens of Hellas, how magic the falling
Of dusk in the asphodel fields of Eleusis!
Hearts throb at the lilt of sea-chanties resounding
From China-bound clippers' romantic cabooses;
But nothing compares with the entry astounding
Of *Morgan and Mooney, the Misses, Massooces.*

III. But primordial slime, after all, is our Mother;
'Neath all our refinement we're children of hers.
The gibbering ape we must own as our brother;
We are kin to the maggot that loathlily stirs.
And thus among some a return atavistic
To the level of worm or of maggot occurs;
Their sense of the good and the rare and the mystic
Aboriginal mental opacity blurs.
So that e'en in the ranks of the true British gentry
You may find some abandoned and horrible curs
Who debase this ecstatic, this exquisite entry
To Morgan and Mooney, the Misses, Masseuses.

G.E.G.F.

* *Poetic licence.* The bard has neither heard nor seen this fabled instrument.

TEN YEARS AFTER.

THROUGHOUT the many years of silent vigil over London, "Old St. Paul's" has witnessed hundreds of human beings congregated on its steps below, sometimes in large crowds, sometimes in small meetings; but of all these gatherings none could be more exciting to those concerned than the one which took place on April 8, 1929.

It may interest readers to know the origin of this meeting: we therefore return in thought to the days of war. During that time a staff of ten telephonists and one Supervisor was loaned from Holborn Exchange to a P.B.X. attached to a temporary Government Office known as the International Commission, where, in spite of the dark days prevailing, three or four of the happiest years in the "Service" were spent together.

Then came Armistice, and with it the realisation that separation was inevitable; a suggestion was, however, put forward which resulted in the following agreement being drawn up and signed by all: "We the undersigned agree to meet on the steps of St. Paul's at 5.30 p.m. on April 8, 1929.

Signed April 8, 1919."

Is it to be wondered at, therefore, that the meeting referred to was exciting and happy! Not one "link in the chain" was missing, and it was with heartfelt thanks that one realised how marvellously all had been preserved during the ten years. After having a photograph taken as a memento the party proceeded to a restaurant for dinner, and at the end of a very happy evening of reminiscences a further agreement was signed, to meet, this time, in five years.

THE AMERICAN TELEGRAPH SYSTEMS.

BY G. T. ARCHIBALD.

(*Continued from p.* 137.)

TRAINING in touch-typing and keyboard operating procedure occupies about three months. During the first three weeks a student is required to learn the five-unit code and to acquire familiarity with the keyboard layout. During this time a learner receives a greater amount of personal supervision than is given in this country. Various exercises have been compiled for practice purposes and for the encouragement of a good style of operating. All keyboard practice is gained on the type of machine which a learner will eventually be called upon to operate. The system of training is much more thorough than that in use in this country, and I may say that steps are being taken to see how far we can profit by our experience in America.

The qualifying standards are rigorously applied and no learner is employed on live traffic until he or she has been certified as fully competent.

A learner is also required to undergo, at least once a week during the period of training, a written examination consisting of ten questions on operating procedure. The Inspector discusses with the learner the points upon which incorrect answers have been furnished. At the end of the training period a final examination of 25 questions is set and a learner must earn 95% of the 100 marks obtainable.

After passing the qualifying tests a learner is assigned whenever possible to a busy circuit, preferably beside an experienced operator who is expected to render moral support and to see that the circuit is kept reasonably clear of traffic. A young operator is required to perforate for at least three hours a day until certified as a finished operator. For a time after a young operator has been assigned to a working point his or her work is inspected at intervals by an Instructor.

Operators attached to non-functional offices are trained in the maintenance and adjustment of teleprinters, and the maintenance by telegraphists, both male and female, is so satisfactory that a mechanic is not located at such offices.

I should perhaps make it clear that what I have to say on the American telegraph organisation from this point onward will refer more particularly to the Western Union Telegraph Co., except where otherwise stated.

Conditions of service in America differ radically from those in operation in Great Britain.

The usual hours of attendance are 48 hours per week. Meal reliefs are not provided in the company's time, but each employee (operating and non-operating) in the operating room is allowed two rest periods, each of 15 minutes, during the day; the total time worked is, therefore, 45 hours per week, as in Great Britain. Meal relief periods are scheduled on all duties and are recorded as "time off." All time taken over and above these reliefs is deducted from the operator's pay bill.

One week's annual leave with full pay is allowed to each employee with less than two years' service; two weeks' leave are granted after two years' service, and three weeks' after 30 years' service. Employees who can be spared are granted leave with full pay on what are known as legal holidays, corresponding to Bank Holidays in this country. Annual leave must be taken at the convenience of the company. Practically no leave is granted in the operating department during July and August. About 15% extra staff is provided at the larger offices for sick and annual leave and for other emergencies, including assistance to branch and other offices.

Hitherto annual leave has not been granted officially to employees of the Postal Telegraph-Cable Company. Many officers of the Company were permitted unofficially to take a holiday, and arrangements have now been made to come into line with the Western Union Company.

Double pay is given for work on Christmas Day and on legal holidays. As a rule Sunday work is paid for at the rate of time and a half but at a few small places, where telegraph business is conducted only during certain hours of the day, Sunday attendance is reckoned as part of the 48-hour week.

No telegraphist is guaranteed a full week's work, but those employed on a full duty receive full pay until due notice of reduced attendance has been given. The more senior members of the staff work full time all the year round, but in the slack season juniors may be required to work for only six or four hours a day, with a corresponding reduction of pay. When traffic is very light junior members of the staff may be placed on "furlough" without pay. It is usual, in such cases, for the persons concerned to be given two weeks' notice. Officers placed on leave without pay retain their seniority and any privileges during the period of enforced leave. No operator is placed on leave without pay, except at his own request, unless excess force cannot be reduced by short time attendances, and every effort is made to maintain full time working by temporary transfer before short time is introduced.

No monetary allowances are paid for the encouragement of technical study. The company will, however, advance as a loan the cost of technical correspondence courses—about $30—the money being refunded in monthly instalments.

Women are not obliged to resign on marriage and there is no marriage gratuity. Between 60 and 70% of the female staff are married women.

There is no free medical attendance.

As regards sick pay and pensions the Western Union Company created a fund with an initial appropriation of one million dollars which is maintained at that level provided that in no year the sum required exceeds 4% of the Company's pay roll. The fund is credited with interest at the rate of 4% per annum on the average monthly balance. It is administered by a Committee, appointed by the Board of Directors, which has very wide powers. All administration expenses are paid by the company and are not a charge on the fund.

Pensions may be granted to men and women after 20 years' service upon reaching 60 and 55 years of age respectively, at 55 and 50 respectively after 25 years' service, irrespective of age after 30 years' service, and irrespective of age on total disablement as a result of sickness or injury arising out of and in the course of employment by the company after 15 or more years' service. In the last case the pension is paid only during the period of disability.

Pensions are calculated at the rate of 1% of the average pay during the 10 years preceding retirement, or, at the discretion of the managing committee, upon the average pay of the 10 consecutive years during which the employee was paid the highest rate of wages. The minimum and maximum pensions granted for long service are $360 and $5,000 a year respectively. Pensions cease at death, but the committee is empowered to continue payment for a full month up to a maximum of 25 dollars to the relative or other person responsible for the pensioner's funeral expenses.

A number of men between 65 and 70 years of age are still working as morse operators, and it seemed to me that very few people could afford to retire on pension unless possessed of private means or alternative employment.

Sick pay is not so liberal as in this country. Supervising officers, who are expected to work additional hours without pay at any time, receive pay for sick leave from the first day.

Sick pay is allowed to telegraphists under the following regulations:—

(*a*) Under 2 years, no pay.
(*b*) 2-5 years' service, full pay 4 weeks, half pay 9 weeks.
(*c*) 5-10 „ „ „ „ 13 „ „ „ 13 „
(*d*) 10 „ „ or more, full pay 13 weeks, half pay 39 weeks.

No pay is given during the first seven days of sick leave.

The Postal Telegraph-Cable Company has a similar scheme.

I was told that sick leave in the Western Union Service averages about 12 days per annum, but no definite statistics are available.

Death benefits are paid in the case of accident on duty up to the equivalent of three years' wages with a maximum of $5,000. Similar benefits are paid in cases of death through sickness up to a maximum of one year's wages if of 10 years' service or more, six months' wages if of service of from 5 to 10 years. The maximum in this case is $2,000.

If in any year the fund is insufficient to meet all demands, and the company is not in a position to make an additional grant, the available funds are applied in the following order:—

1. To the payment of Pensions already granted.
2. „ „ „ granted during the year.
3. „ „ accident death benefits.
4. „ „ sickness death benefits.
5. „ „ other death benefits.
6. „ „ sickness disability benefits.

One of the most striking things about American telegraph organisation is the extent to which specialisation has been developed. Practically everybody is specialised, from the top to the messenger boy who delivers telegrams and he specialises on particular walks.

Classification of Staff.—The staff may be divided into six main groups: (1) Supervising, (2) Testing and Regulating, (3) Operating, (4) Circulating, (5) Collection and Distribution, (6) Clerical.

There are no standards of supervision. The requirements of each office are carefully studied and the amount of supervision depends largely upon the class and volume of the traffic to be handled and upon the topography of the building.

Supervising.—Control of a functional office is usually vested in a chief operator, who is responsible directly to the appropriate Division Traffic Superintendent.

At the larger offices an Assistant Chief Operator is placed in control of each type of apparatus, multiplex, teleprinter, morse and telephone; at smaller offices the duties are combined according to local circumstances. Each Assistant Chief Operator is responsible for the work of his division. He allocates to the Senior Supervisors, who correspond to Assistant Superintendents in the British Service, the force necessary to dispose of the traffic.

Senior Supervisors arrange the duties of the operating staff in the sections controlled by Supervisors, who correspond to Overseers in the British Service. The Supervisors are responsible for the movement of traffic, and are required to report immediately in any emergency, and hourly as to delay at each circuit, and the number of telegrams on hand. They must keep in close

and constant contact with the traffic in order to see that no undue delay is allowed to accrue on fully paid class messages.

About 35% of the Supervisors are women.

The number of operators supervised by one sectional officer varies from 8 to 30. By reason of the heavy loads, the urgency of the traffic, and the quality of service, not more than three automatic circuits are contained in one section. Supervising officers are not responsible for the apparatus.

Under the control of the Chief Operator are the testing and regulating staff, the Automatic Chiefs and their assistants, and the maintenance staff.

Practically the whole of the testing and regulating staff is drawn from the operating force. Men who show adaptability and are known to take an interest in technical telegraphy are selected for this work. They are trained at the company's expense under qualified staff at working positions. No exceptional theoretical technical qualification is held to be necessary, but only telegraphists possessing a fair technical knowledge are considered eligible for promotion to this force.

Promotion.—Promotion to supervisory and technical duties is strictly by merit. Seniority is the deciding factor only where other qualifications are equal.

As a rule a supervising officer is drawn from the testing and regulating staff employed in the division in which he will be required to supervise.

During periods of seasonal pressure telegraphists may be required to act as Supervisors, but their pay is not necessarily increased during such periods. Similarly, during slack periods, Supervisors may be required to act as operators, and their pay during such periods is not necessarily reduced. In cases where there is a permanent reduction in traffic, a supervising officer may be reduced permanently to the grade of telegraphist.

An operator assigned to one type of circuit is rarely required to operate another. In a few cases, however, where complete specialisation would not be economical, a small number of operators may be required to work at multiplex and teleprinter circuits, but morse operators, unless specially trained, are not required to work at printing telegraph circuits.

About 67% of the operators are women. This proportion is increasing with the extension of the use of teleprinters.

The clerks employed on circulation work, or "routing," as it is called in America, attain a high degree of proficiency. They seldom qualify for positions as operators. Those who desire to do so may attend the telegraph school in their own time.

Rates of Pay.—It was somewhat difficult to obtain what may be regarded as a comprehensive view of salaries in America, and it may suffice if I give you brief details of the salaries paid at functional offices of the Western Union Company, where the grades compare more or less closely with those employed in the British telegraph service.

There are no definite scales of pay, and salaries vary according to the volume of traffic and the cost of living in particular localities. Operators are paid according to the type of circuit at which they are employed, the highest rate being paid in all cases to those operators employed at circuits carrying the heaviest loads.

Staffs employed between 6 p.m. and 6 a.m. receive "differential" pay amounting to 15% on salaries up to $130 a month and 10% on salaries between $130 and $200 a month.

In the Western Union Company salaries are reviewed twice a year by an advisory board, consisting of the Assistant Chief Operators and one, or at most two, members of the local Staff Association. The Board's recommendations are not necessarily accepted by the Chief Operator. In the event of disagreement the person concerned may appeal to the Chief Operator through the local association officials, and the appeal may be carried through successive stages, i.e., the Division Association officials to Division Traffic Superintendent, President of the Association to Vice-President of the department concerned, and finally to the President of the company, whose decision is final.

Every employee of the company is eligible to share in an Income Participation Scheme. This profit-sharing scheme, adopted as a means for encouraging the staff to co-operate in the reduction of costs, is an interesting development. After deducting a certain amount to meet dividends, &c., the remaining profits of the company are divided into two parts, one is distributed to the shareholders, the other to the staff. All regular employees, including messengers, participate in the distribution, which last year was equal to about 4% of their pay. It is expected that a much greater sum will be available for distribution this year.

Duties are divided into three "tours":—

Day	... ...	8 a.m. to 4 p.m.
Early night	...	4 p.m. to 12 midnight.
Late night	...	12 midnight to 8 a.m.

Only about 10% of the staff, and these the more junior, rotate. The period of rotation depends upon local conditions: in New York it is usually two consecutive months on each tour.

The non-rotating members of the staff perform the same hours of duty continuously whilst employed on any particular tour; the more convenient duties being allotted to the officers best qualified for the particular work.

A standard chart for each tour, based on traffic load abstracts obtained for the circuit numbering sheets, is prepared twice annually. The chart is amended from time to time as circumstances demand. The staffing arrangements are so simple that no force is employed on work in connexion with duties. One cannot help feeling a certain amount of sympathy with those who are compelled to work the less favourable duties, but of course they receive the additional pay already referred to for working after 6 p.m. The officials of the company think that regular hours of attendance are better both for the operators and the company. Exchanges of duty are allowed without limit between officers of similar ability working the same type of apparatus.

Each operator is provided daily with a time card bearing his name and hours of attendance: these particulars are recorded by means of an addressograph machine at the larger offices and by typewriter at the smaller offices.

The cards are kept in a rack at a convenient point in each division. On taking up duty the operator selects his card, records the section code and time of arrival by means of a Stromberg Timing stamp and returns his card to the rack. After recording "off" duty at the close of the day attendance cards are dropped into a locked box from which they are collected next day by a clerical officer and checked for pay purposes. Rest reliefs and the meal relief are recorded on the reverse side of the card.

An operator working in more than one division during his period of duty is required to clock on and "off" in each division in order that his time may be charged to the proper type of apparatus, &c.

Records of overtime must be certified by the officer in charge of the section in which it is performed.

Great care is taken to see that correct records are available and any person guilty of wilful tampering with an attendance card is liable to instant dismissal.

Discipline.—Frequent late attendance is penalised in one of several ways. Unpunctuality is, of course, taken into account when the salary of an officer is under review, and may jeopardise an increase of pay.

Persistent unpunctuality is sometimes met by loss of a favourable duty, sometimes by suspension for from one to three days without pay, and, in the last resort, by dismissal.

An operator responsible for an error warranting more severe punishment than a reprimand and a note on his or her record (which is considered when the salary is under review) may be suspended—usually for three days—or dismissed. The companies are liable for damages due to errors up to a maximum of $500.

Operating Procedure.—Supervising officers are responsible for the distribution of telegrams to the various channels on a multi-channel route.

A serial numbering form is used at each channel on all types of apparatus. The operator enters his personal signal—not necessarily his initials—and the time opposite the first and last number dealt with during his period at the circuit. It is not necessary, therefore, for the operator to write his name or sign on the telegram form at either the sending or receiving stage. This saves time.

Operators at duplex morse circuits receive and send for periods of from one to four hours alternately, according to the load at the circuit. Operators at multiplex and teleprinter duplex circuits work alternately two hours as perforator operators and two hours as printer operators. Operators are required to make these changes with as little delay as possible and it was obvious that no time is lost during the change over.

No telegrams are handwritten. At Morse circuits the receiving operator is required to feed a typewriter machine with double forms and a carbonic for each telegram.

Not more than one message may be placed on the sending lectern at a time at a multiplex or teleprinter circuit and each telegram must be timed and placed in the "sent" receptacle before the succeeding message is serially numbered. Tape must not be prepared at a speed which will enable the operator to be more than one message ahead of the transmitter, and in order that the attention of the Supervisor may readily be drawn to the non-observance of this rule, the "slack tape" holes in the tables have been filled in. This regulation has the effect of facilitating the disposal of corrections, &c.

Telegrams exceeding 60 words in length are prefixed by the word "LONG" in order that receiving operators may gum up the slip in a proper manner.

Corrections and reperforations take precedence over all new traffic except "X" traffic, and are dealt with as soon as the tape in process of preparation is completed.

Omitted serial numbers must be reported immediately to the Supervising Officer, but this does not relieve the operator of the necessity for seeing that the number is properly accounted for within a reasonable length of time.

All received telegrams must be prepared in a neat, orderly, legible manner, and in no circumstances is a bad copy allowed to reach the public. Receiving operators are required to use the official moistening apparatus and slip cutter.

An operator may not leave his working position without the permission of his immediate supervising officer. Before leaving a working position, an operator is required to explain to his relief the work in hand so that he may readily assume charge of the position without danger of failure, delay, error or interruption.

External Plant.—I do not propose to say very much about external plant, but the following details may be of interest. In 1927 the Western Union Company owned 214,799 miles of pole route, carrying 1,747,453 miles of wire and 3,419 miles of underground cable. The Postal Telegraph Company then owned 32,355 miles of pole route, carrying 315,176 miles of wire and 7,551 miles of aerial cable and 31,011 miles of underground cable. The reason for this company's larger cable wire mileage is that it has been compelled to take to the roads. Western Union lines, on the other hand, are carried mainly along railway routes in the company's own maintenance. Various right of way contracts between the company and the railways are in operation, in some cases free wires are provided for train despatching and in others railway telegrams are sent free of charge, &c. In certain areas lines belonging to both companies are erected on poles in Western Union maintenance, the Postal Telegraph Company bearing its share of maintenance costs.

Chestnut poles treated for only a few feet of their length are used to a considerable extent. A new preservative agent capable of greatly increasing the life of poles has recently been invented by an American telegraph engineer. Glass insulators costing about half as much as porcelain are also in general use.

Specially equipped trains are provided for Western Union construction gangs who work over long distances. The men are provided with sleeping accommodation, recreation room and dining room, and there is a small office, complete with typewriter, for the foreman. Each train carries a cook and attendants and all meals are taken on board. The men receive their food in part payment of wages. We were invited to take lunch on this train; the food was plain but of good quality. I rather envied the man with an appetite equal to the enormous helping of food placed before me. Cards and other games are provided at the company's expense.

So far not much use has been made of phantom circuits but both companies have recently concluded important agreements with the American Telephone and Telegraph Company for the use of composited and other phantom circuits. Mr. Carlton, the President of the Western Union Company, is looking forward to the time, thought by many people in America to be not very far distant, when all telegraph circuits will be operated over phantom circuits. This, Mr. Carlton thinks, and rightly, will expedite the cheapening of transmission costs.

Circulation.—The system of circulation or routing resembles that in operation in Great Britain. All the Western Union Company's lines run along the main railway routes and the traffic is circulated by the most direct geographical route consistent with wire conditions.

In a few cases large branch offices serving particular industries are provided with direct communication with the centre of the industry concerned, *e.g.*, Cable Office, New York, works direct with the cities dealing with heavy cable traffic, the Fish Market Office at New York works direct to the Fish Market Office at Boston, &c.

Similar arrangements are in operation in the Postal Telegraph system.

Instrument Layout.—The offices of the Western Union Company at New York, Philadelphia, Washington and Chicago are very well equipped and arranged. Everything is done to reduce handlings to a minimum and to facilitate the transfer of traffic from one point to another, and generous use is made of labour-saving devices.

Whenever possible the whole of the apparatus is located on a single floor, but at the largest offices in New York, Chicago, Philadelphia, &c., this arrangement is not practicable owing to the extensive equipment required to deal with the traffic. In New York, for instance, the present office occupies eight floors of a building belonging to the American Telephone and Telegraph Company.

It is the practice to arrange all apparatus of the same type in one division.

Double tables with belt conveyors feeding into a common conveyor connected with the main circulation table are standard at all large offices, and outgoing traffic is also carried by conveyors to convenient drop points on the various floors and sectional areas from whence it is circulated by hand to the appropriate circuits.

The keyboard operator's chair consists of seamless steel tubing cut and bent to suitable prescribed dimensions and details. The lower extremities of the frame are fitted into four metal steel sockets to which the castors are fixed. The back frame consists of a tempered steel rod capable of withstanding pressure applied to the back rest which is bolted to a strip fixed to the upper extremity of the rod. Both the back rest and chair seat are padded. The seat is fixed, but the chair is capable of being fitted with castors to enable operators at simplex circuits to move easily from the sending to the receiving position, and *vice versa.*

Table belts convey the telegrams to inclined belts, these in turn transfer them to an overhead belt running at right angles to the tables leading either by means of chutes or other conveyors to a general distribution table. The belts travel in open troughs of sheet-iron which prevent the messages from slipping off. The telegrams pass along the circulation table on a slow-moving belt but before reaching the circulating positions the forms are faced by girls (routing aides) in order to facilitate their treatment by the circulators. Each circulator takes traffic from the belt for sortation and any telegram which passes the last position is collected by a supervisor and distributed to the circulators by hand.

Any telegram which cannot be circulated without reference is passed to a routing aide, who traces the destination by means of a leaf index like the "Bizada" and indicates on the form the proper circulation.

The telegrams are sorted direct to travelling belts, arranged immediately in front of the circulators, which serve drop points in the various sections. Distribution from drop points to the circuits is performed by routing aides who dash about in tireless fashion. At Chicago a number of young people are provided with roller skates to facilitate circulation of "class" traffic. The gangways in the present New York office are not suitable for this form of locomotion, but I believe it will be adopted when the new office is available in 1930.

Internal Apparatus.—As I pointed out earlier on, the Western Union Telegraph Company were pioneers in the use of machine telegraphy and they have ever been on the look-out for a good and reliable system. Until quite recently, however, the Postal Telegraph Company depended entirely on morse, but it is now making rapid strides in the development of machine apparatus and at the present time it is little behind its rival so far as methods are concerned.

In the Western Union system morse sounders and in some cases telephones are being replaced rapidly by teleprinters. The use of teleprinter circuits on branch office circuits carrying a moderate load is enabling the company to combine clerical and operating work.

Triple and double automatic multiplex circuits working at speeds of from 48 to 60 words per minute, with tape printing receivers, are installed on all the principal and heavily-loaded routes of both companies. The view is held that it is better and more economical to work a small number of channels at a speed consistent with a high degree of stability and approximating to the capacity of the expert operator than to work a larger number of channels at a relatively low speed. The Baudot method of phase correction is used, but the correction impulses are generated by the actual working signals.

On the more important circuits in the Western Union System separate distributors, independently driven, are used for sending and receiving. The breakdown of one distributor does not disturb the working in the opposite direction and this in itself is an important consideration.

On circuits fitted with single distributor sets each office acts as "correcting" station in alternate weeks.

In the Postal Telegraph system practically all multiplex circuits are double duplex working at speeds of from 50 to 60 words per minute and the distributors are of the cam contact type, driven by D.C. motors, the speed of which is controlled by a vibrating fork. Electrical correction is employed, the speed of the vibrating forks being corrected by the correction impulses generated by the working signals. In this system too, synchronising apparatus is segregated but the question of reverting to the old arrangement is under consideration.

Three station or divided multiplex circuits are extensively used by both companies.

As many as 12 repeaters are required on the long east-to-west circuits. In cases where the cumulative distortion of signals due to long-line sections and ordinary repeaters would render it difficult to maintain a satisfactory speed of working, regenerative repeaters are installed at distances about 500 miles apart. These repeaters not only strengthen the signalling current in the next line section but correct distortion and maintain perfect signals.

Western Electric transmitters and automatic control units are used and the Morkrum keyboard perforator, which is simple in mechanical construction and easily and cheaply maintained, is preferred to all others.

Experience has proved to the Western Union Company that the maintenance of page printers costs nearly three times that of tape printers, and the type bar printer made by the Morkrum-Kleinschmidt Company is in general use on the company's multiplex circuits. The experience of the Postal Telegraph Company is similar and they intend sooner or later to abandon page printing.

Extensive use is made of start-stop apparatus, especially in the Western Union Company's system. What we know as the Morkrum 2A is standard.

When duplex conditions are warranted a teletype 2A is used for sending and for printing a home record and a separate printer unit is used for reception. The company is now considering the possibility of dispensing with the home record.

All multiplex and teleprinter sets are mounted on specially wired tables equipped with automatic time stamps, numbering machines and gumming desks of standard pattern.

Teleprinter concentrators accommodating four to six circuits are widely used, but so far neither company is satisfied, and both contemplate the use of units accommodating a larger number of circuits.

Morse.—Morse is a back number in America. The vibroplex key and typewriter reception are used universally. The operators provide their own keys, which are maintained by the companies. At one time the operators provided their own machines: they are now provided by the companies.

Reference should perhaps be made to the use of a device known as the Gill selector used at concentrators for the purpose of enabling one office to call another office on the same line without producing a signal at the concentrator. The attention of the concentrator office is gained by the use of a definite calling signal which operates the Gill selector at that office and lights the signal lamp.

(To be continued.)

SERVICE INSPECTION AND THE CALLING RATE.

BY R. S. GROSVENOR, GLOUCESTER.

THE duties of an officer engaged on Service Inspection are varied and call for considerable tact, patience, strict accuracy, a true perspective and a cheerful manner. He is required to interview all classes of subscribers, in all kinds of places and all kinds of moods, from those who will discuss and eulogise or disparage the service at length to the subscriber in a small way of business who is very suspicious of the procedure and flatly declines to make any calls for the purpose of a test, at the same time stating: "The service is quite satisfactory. Thank you!"

An article on the experiences of a Service Inspector would be interesting. It is hoped that one may be forthcoming. The Service Inspector is a liaison officer between the service and its subscribers. While testing the quality of the service generally is the primary function of the duty, opportunity is taken whenever possible to draw attention to the lesser-known facilities of the service, e.g., fixed time trunk calls, despatching and receiving telegrams, express and ordinary letters, night telegraph letters, &c.

Much more than this, however, can be done. An officer engaged on this duty has an exceptional opportunity to do his bit—in fact, an appreciable piece—in stimulating the calling rate. Oh, yes! it is easy enough to say this, and quite another matter to carry it out. The object in view, however, is vital to the interests of the service and calls for energetic action.

Now to consider the ways of achieving this object. There are many. The great majority of subscribers visited express satisfaction with the service. An atmosphere can be frequently created to allow the question of use to be introduced. If subscribers can be induced to make on an average one more call each per day, what a difference the operating statistical records will show. New subscribers should *always* be carefully approached as to use and the many advantages and facilities of the service pointed out according to the position or business of the person or firm visited.

When visiting subscribers connected to small or rural exchanges, the relative trunk and junction facilities should be well known, in order that any question arising can be fully dealt with. Any extension or authorised extension of such facilities should be carefully explained and increased use thus encouraged. Subscribers should be reminded of the variation in the rates during the day 7 a.m. to 2 p.m., 2 p.m. to 7 p.m. and 7 p.m. to 7 a.m.—and further, that delay is generally very much less during the periods from 2 p.m. onwards. Where opportunity occurs attention should be directed to the reduced fees for prolonged use of Trunk circuits. A Service Inspector should be a *missionary* as well as an *emissary*, ever spreading the great value of the word spoken by telephone, emphasising the fact that a reply is obtained frequently resulting in the successful completion of an important business or social matter. The International Services should not be overlooked.

Again, subscribers should be tactfully invited to read the preface of the Telephone Directory, which it is safe to say a very large number do not. This leads to an important point in an inverse direction.

A Service Inspector is *in a unique position to ascertain why individual subscribers do not make more use of the Telephone.*

Frequently this is obvious after a few minutes' conversation, when the subscriber becomes red in the face and commences to use certain words that are not in the Telephone Directory. The importance of recording and following up complaints, even those whose face value seem trivial, cannot be over-estimated. Firm assurance should be given that any complaint will be fully investigated and the matter not allowed to be closed until satisfaction is expressed. *Subscribers with a grievance are discouraged users*, and very careful attention is called for in order to give renewed confidence. No doubt many potential calls are lost in this manner, and it is essential that such loss should be minimised as far as possible.

It is the small matters that count and often cause a subscriber to say "Oh! never mind, I will run over and see so-and-so, instead of using the telephone."

An opportunity of obtaining particulars with any helpful details regarding prospective subscribers should be sought and the information speedily passed on to the appropriate quarter.

A Service Inspector is also frequently approached regarding additional facilities, e.g., residential connexions, auxiliary lines, extension circuits, &c. Enquiries of this nature should, of course, be encouraged, and under fitting circumstances such facilities suggested.

Additions to existing installations are not only good business but leads to increased use.

A further important aspect of this duty is the assistance and advice that can be given. Experience shows that subscribers always welcome useful information and advice on telephone matters. It has to be kept well in mind that a subscriber is generally quite unaware of what is entailed to establish a connexion. Operating procedure is more or less unknown to the individual subscriber. The result of a simple explanation generally means a more satisfied user, with consequent increased confidence in the service.

It is somewhat remarkable that a large proportion of subscribers—many of long standing—are still unaware of the correct method of carrying out their part in the promotion of a quick and efficient service.

Subscribers often refrain from making calls to a specific number or numbers because difficulty has arisen in the past with such particular calls. The necessity of drawing the attention of the operator to difficulty during the progress of a call or of asking for the Supervisor and reporting any trouble experienced immediately it occurs, cannot be too firmly impressed.

The telephone habit can be greatly encouraged by educating users in the value and economy the service affords to both the business and private life of the country. To use the telephone in preference to a slower means of communication is sound advice. A really efficient and consistently developing telephone service is available to the public. Efficiency is the Department's motto. Telephone plant, both internal and external, of the very best calibre is being used. Automatic systems in which the most up-to-date plant and devices known to the telephone world are being gradually introduced to improve the service generally and provide for development. While an excellent telephone service is available in this country, the slogan, "The country at your elbow," is rapidly becoming inadequate. It will very shortly be "The world at your elbow."

Tremendous progress has been made in the comparatively short life of the Telephone Service—what a difference between a mere 40 years ago and to-day.

All these facts should be kept well in the mind of a Service Inspector when calling upon subscribers—*the Department's customers.* As an accredited representative of a truly worthy service, the Service Inspector in his official capacity has a splendid opportunity of advertising our wares, and in so doing help and educate our subscribers to understand, realise and appreciate the value of the Telephone Call. We are proud of our service. Certainly! Very well, talk about it "good and plenty." Subscribers generally are not taking anything like the advantage of the service that should be the case, and our main object, by every means in our power, is to induce them to do so.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at Feb. 28, 1929, was 1,742,095, representing an increase of 11,313 on the total at the end of the previous month.

The growth for the month is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at Feb. 28	621,970	1,120,125
Net increase for month	4,400	6,913
Residence Rate Subscribers—		
Total	148,274	234,107
Net increase	1,631	2,299
Call Office Stations (including Kiosks)—		
Total	5,569	20,198
Net increase	33	90
Kiosks—		
Total	1,260	4,960
Net increase	15	63
Rural Party Line Stations—		
Total	—	10,412
Net increase	—	35
Rural Railway Stations connected with Exchange System—		
Total	17	1,074
Net increase	—	39

The total number of inland trunk calls dealt with during January, 1929 (the latest statistics available) was 9,318,168, representing an increase of 962,300, or 11.5% on the figure for the corresponding month of the previous year. Outgoing international calls in January numbered 42,940, and incoming international calls 45,233, representing increases of 12,270 (40.0%) and 13,416 (42.2%) respectively over January, 1928.

Further progress was made during the month of March with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Archway (automatic), Temple Bar (automatic), Emberbrook, Flaxman, Hillside, Metropolitan, National.

PROVINCES—Elsham (rural automatic), Linthorpe (automatic), Middlesbrough (automatic), North Stainley (rural automatic) South Bank (automatic), Stockton (automatic).

And among the more important exchanges extended were :—

LONDON—Hounslow.

PROVINCES—Cambridge, Egham, Godalming, Greenock, Hamilton, Malone, Reading, Stoke Bishop, Wellingborough, Westbury-on-Trym.

During the month the following addition to the main underground system was completed and brought into use :—

Birmingham—Nuneaton,

while 72 new overhead trunk circuits were completed, and 82 additional circuits were provided by means of spare wires in underground cables.

C.T.O. NOTES.

(1) *Bowls.*—The C.T.O. Bowling Club, which was founded in 1922, has arranged to play eleven matches on the green of the Civil Service Bowling Association at Chiswick during the 1929 Season, six with Post Office Bowling Clubs, A.G.D., L.P.S., L.T.S., S.B.D., Paddington District and Engineering Department, and five with Clubs connected with other Government Offices, Admiralty, Inland Revenue, Ministry of Transport, Customs and Excise and Civil Service Headquarters.

(2) *Chess Club.*—The Centels Chess Club have just completed another successful season—the sixth of its career. The first team was No. 2 in the third division of the Civil Service League with 8½ points out of a possible 11, and No. 3 in the London League "C." The second team, which has received welcome recruits from the youth of the Office, won 7, drew 2, and lost 4 games. The local championship together with the "Laxton" Cup was won by Mr. D. J. Charlton. The President's prize for the best score in the first team was won by Mr. J. Fennell with 12½ points out of 18. Mr. J. P. Morgan who has played top board won 5, drew 7, and lost 3. Mr. F. Lobb headed the second team with 9 points out of 10.

(3) *Football.*—The C.T.O. Messengers have this winter won both the Shield of the Junior Post Office Football League and the Cup.

(4) *Retirements.*—Clerical Officer—Mr. E. J. WEBBER. Superintendents—Messrs. E. M. DIAPER and H. E. CULLUM. Assistant Superintendents—Messrs. E. R. JAMES and A. J. R. ROWLANDS. Overseers—Messrs. E. J. BURCKHARDT, J. G. SMITH, and E. A. ROBINSON. Telegraphists—Messrs. C. G. SIMMONS, J. WRIGHT, and D. SUTHERLAND. Supervisor—Miss A. E. Hickson. Assistant Supervisors—Miss F. M. COOKE and Miss M. E. DAVIES. Telegraphists (Female)—Miss R. SAMUEL and Mrs. E. D. LYLE.

(5) *Promotions.*—Mr. J. H. G. CLIFTON, Assistant Superintendent to Superintendent. Messrs. C. B. FRANKLIN, H. A. SONGHURST, and D. D. EVANS, Overseers to Assistant Superintendents.

(6) *Obituary.*—We regret to record the death of Mr. W. J. Walton and Mr. H. Davis. The former was on the Night Staff and the latter attached to the "D" Division.

LONDON ENGINEERING NOTES.

Exchange Construction.

The following automatic exchanges were opened during March :—

Temple Bar (Russell Street, W.C.2).
Archway (Pine Grove, Tollington Park).

The following particulars of automatic exchanges already opened in the London area may be of interest :—

Name.	*No. of Equipped Lines.*	*Date Opened.*	*Manufacturer.*
Tandem	—	Aug. 8, 1927	A.T.M.
Holborn	9,400	Nov. 12, 1927	,,
Bishopsgate ...	8,000	Mar. 4, 1928	,,
Sloane	8,400	July 28, 1928	Standards.
Bermondsey ...	2,600	Sept. 1, 1928	,,
Monument	9,450	Nov. 3, 1928	A.T.M.
Welbeck	8,700	Dec. 1, 1928	Standards.
Western	7,100	Jan. 5, 1928	Siemens.
Temple Bar ...	7,700	Mar. 2, 1929	Standards.
Archway	3,100	Mar. 9, 1929	General Electric Co.

The following Automatic Exchanges will be opened during the next few months :—

	No. of Equipped Lines.	*Manufacturer.*
Beckenham	3,000	Siemens.
Reliance	2,700	General Electric Co.
Maida Vale	7,500	Siemens.
Edgware	1,300	General Electric Co.
Metropolitan	9,500	A.T.M.
National	9,500	,,
Fulham	7,500	Standards.
Flaxman (Kensington) ...	9,900	General Electric Co.
Mitcham	1,480	Siemens.
Hendon	4,200	A.T.M.

Promotions.

Mr. E. GOMERSALL to be Superintending Engineer of the London Engineering District *vice* Mr. McIlroy.

An account of Mr. Gomersall's career has already appeared in this *Journal*. It may be stated here that Mr. Gomersall brings to his task a wide and unique experience which will still further enhance the prestige of the London Engineering District.

Mr. CORNISH to be Deputy Superintending Engineer *vice* Mr. E. Gomersall.

Mr. Cornish commenced his career as a pupil with the City of Bath Electric Light Company and later entered the service of the Swansea Harbour Trust as a Power Engineer with the late Mr. Augustus Schenck. Subsequently Sir William Preece obtained his services for the Engineering Department of the Post Office which he entered in 1893 and was stationed at Birmingham as Power Engineer.

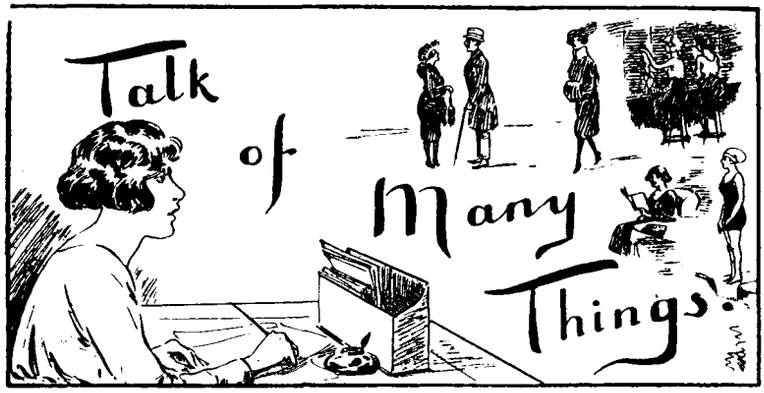
In 1906 Mr. Cornish was promoted to be First Class Engineer at Birmingham, and in that capacity performed the varied duties connected with Power Telegraph and Telephone Engineering, which then, as now, fall to the lot of a Provincial Sectional Engineer.

Shortly afterwards he was transferred to London with Headquarters at Mount Pleasant. Whilst there he was in charge of the Generating Station, Miscellaneous Power Plant, and the Power Test Room. Later he was engaged in the Test Section on Cable and Miscellaneous testing work under the late Mr. Hartnell.

In 1908 he was transferred to the Power Section and was engaged on work connected with the provision of the new Power Stations and Sub-stations, and also the equipment of the new King Edward Building. In 1909 he was promoted to be Assistant Superintending Engineer in the London Power District, and in 1912 was again transferred to the Power Section in the Engineer-in-Chief's Office and was engaged on work in connexion with Post Office Tube Railway, Imperial Wireless Scheme, and developments in connexion with a Central Power Scheme.

Mr. Cornish now becomes Deputy Superintending Engineer, and in that capacity has received the congratulations and retains the good wishes of all those who know him. He combines a wide practical experience based upon sound technical training with a cultured outlook.

WE TELEPHONISTS



Talkies.

KNOWING how keen you are on statistics—for do you not meet together early in the morning to ponder upon them—I thought you might like to know that, during the year ended Mar. 31, 1929, over six hundred million calls were originated in London. Far be it from us, who live by word of mouth and who know that speech is golden and that silence does not give content—far be it from us, I say, to do anything to discourage people from talking. But between ourselves, don't you really think that something ought to be done about it ? Isn't it awful that people should talk so much—chattering away from roseate morn till dewy eve and oft in the chilly night, every day including Sundays, Good Fridays, Christmas Days and Bank Holidays, with scarce a break ? Fancy 12-and-eight-noughts people, all talking—what a row ! Of course, I know that some of the calls are ineffective, but since they give rise to far more language than effective calls, the net result is the same. Words, words—countless in number, infinitely varied in combination, expression and meaning—Heavens, what a flood !

Undoubtedly, we talk more than our forefathers. The day is no longer now than then, and I suppose we don't talk any faster, so that we must have a much smaller amount of time available for thinking. We even wag our tongues in these days to save our legs—I do not mean to suggest, of course, that our eminently respectable forbears waved their legs to express their thoughts. But the talking habit is increasing, not merely in relation to telephones. We have put up wires and installed boxes of tricks to collect speech from the ether, and loud-speakers blare at us from the four corners of the earth. Now, however, the last straw has dawned above the horizon. It flickered feebly at first, then, winging its path with stealthy tread, it began eating into the optical silence and finally, its hot breath beating upon our startled senses, it is tightening its icy grip upon us with a nasal twang. The movies are turning into talkies. No longer shall we be able to slip into speechless vision, lulled by sweet music and soft lights. The oriental appeal is to be marred by the occidental squeal and the tender kiss of the strong silent hero of the film will lose its thrill in audibility.

Where now shall we turn in those moments when all speech is boredom and when we crave only for quietude ? Well, there are always the mountains—the Ararats above the flood. Their grandeur compels silence. You can't talk much when you're climbing, and, if you do, the wind hurls the words into space. Listen, and you will hear sounds far sweeter than speech. The trees give you "Good-day and God-speed" as you pass, and when you look down upon them they seem to be waving you upward. When you fling yourself down to rest the grass whispers and the refreshing spring sends back a gurgle of pure laughter. As you press forward the rocks ring to your tread and the loose stones leap downwards with a joyous abandon. And then you reach the summit. Far below men are creeping slowly like beetles along the winding ribbon of road, and they are still chattering—chattering of Heaven knows what. But on the summit there is such a sense of remoteness—such a vista of beauty that speech is sacrilege. The only drawback is that you might meet

PERCY FLAGE.

Sydenham Exchange.

A Tea and Entertainment was given to 200 poor children of the Penge and Sydenham Districts by the staff of the Sydenham Exchange on Saturday, Mar. 9.

After tea, which was consumed with great zest, the children settled down to the entertainment. They were invited to join in the songs and choruses, and judging by the lusty yells which emanated from small throats, thoroughly enjoyed this part of the programme.

The activities of a theatrical horse, which was manipulated by two engineers, caused great excitement. It danced, sang, performed numerous tricks, and gave the kiddies rides round the hall, giving great delight.

On leaving, each child was the recipient of a bag containing fruit, sweets and a toy.

It is gratifying to know that it was a success as everyone (including engineers) worked hard to achieve this end.

H. R.

Tommy Beck.

You have gone—and we are left,
Tommy Beck.
Of your smiling face bereft,
Tommy Beck.
Never more as Sun God gay,
Or Commissionaire O.K.,
Shall we see you in our Play,
Tommy Beck.

Never more—ah, sad and strange—
Tommy Beck,
Will you brighten the exchange,
Tommy Beck.
And with greeting debonair
Clear the thunder from the air
Which is *sometimes* gathered there,
Tommy Beck.

But we think you really ought,
Tommy Beck,
Now and then to spare a thought,
Tommy Beck,
For your colleagues left behind
To the turmoil and the grind—
Oh, we'll think it more than kind,
Tommy Beck.

And when you fresh heights have scaled,
Tommy Beck,
And your newer joys have paled,
Tommy Beck,
Bright as sunshine after rain,
Bringing solace for our pain,
Will ye no' come back again,
Tommy Beck !

A Lament.

Oh, May-day ! Oh, May-day !
You follow after Pay-day.
But what a tragedy it is,
When you turn out a grey day !

Herald of the merry month,
When ev'ry day's a play-day !
We expect that May the "Wun"th
Will be a bright and gay day !

Especially since we are, 'tis plain,
No longer in our hey-day—
Ah ! this would make us young again
A real old-fashioned May-day.

C. A. S.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

GLOUCESTER NOTES.

AT a well-attended meeting of the Cheltenham Chamber of Commerce, held on Mar. 12, a paper on "The Cheltenham Automatic Telephone System from a Traffic Point of View," was read by Mr. R. S. Grosvenor, Traffic Superintendent, Gloucester. Some 50 or more members of the Chamber were present and each was supplied with a simple diagram showing the system of switching. A demonstration set was utilised to illustrate the outstanding features of the system.

The object of the paper was to increase the interest of the members in the telephone service and thus to stimulate the use of that service. To this end, special attention was called to the comparatively low calling rate at Cheltenham. The paper was given a good reception and in the course of a somewhat prolonged discussion which followed, it was apparent that interest had been aroused to the many advantages to be derived from greater and more consistent use of the service.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of March resulted in a net gain of 3,190 stations, as compared with 4,356 stations last year.

Business during March was very unsatisfactory, and in spite of strenuous efforts and repeated doses of "ginger" the figures failed to reach the 1928 figure. Search for the cause of the slump has revealed an accumulation of adverse circumstances each of which must bear its part of the blame for the poor results obtained. Among the adverse items may be mentioned the early Easter reducing the number of working days, the absence of the Court from London, Budget doubts and fears, the General Election, the high Bank Rate, &c., &c.

The enquiry has revealed, too, what a grip the "payment by instalment" system has got upon the present generation. Houses, furniture, motor cars and even clothes are purchased on this basis, and so many possible subscribers say they cannot at the moment afford telephone service but as soon as the house or the motor car or what not is paid off, they will have the service. A monthly rate would help here!

There were 365 exhibitors at the Ideal Home Exhibition, and orders were obtained for exchange lines from 151 of them. Last year there were 424 exhibitors who produced orders for 152 lines.

This year a "Printing" Exhibition was held at Olympia—quite a new one—and orders for 133 lines were obtained from 230 subscribers.

A new type of concrete kiosk (known as No. 3), specially designed for the Department by Sir Gilbert Scott, R.A., has been adopted for general use in urban districts. The window frames and the beading which surrounds them are painted red; the tint of the concrete walls and door resembles Portland stone but is rather warmer. There are glass signs embodied in the opening at the top on each side with the word "Telephone" in maroon letters on a cream ground.

An emergency device has been introduced for use in connexion with fire, ambulance, or police calls from multi-coin boxes connected to manual exchanges. By pressing a button and without having to insert coins in the coin-box, the caller gives a flashing signal to the exchange which will receive priority over other calls. The device is not required in multi-coin box call offices connected to automatic exchanges because the caller can dial "O" and obtain the attention of an operator without the insertion of coins.

* * * *

Obituary.

We regret to announce the death of Mr. A. W. Eames, Contract Officer, Class II, of the South-East District Contract Office. Mr. Eames always suffered from poor health but carried on in a brave manner. He was a very kind and good-hearted man, and his passing is deeply deplored by all who knew him.

Mr. Eames, who belonged to what we may call a Post Office family, commenced his career with the National Telephone Co. and spent most of his service with the South-East District Contract Office.

The sympathy of all of the staff is extended to Mrs. Eames and her two sons in the time of their bereavement.

The funeral, which took place at Honor Oak Cemetery, was attended by representatives of the Office.

The London Telephone Service was deprived of the services of one of its senior Traffic Officers when Mr. C. I. Welch, Assistant Superintendent of Traffic Class II, passed away on Saturday, Mar. 16, following a brief absence on sick leave. He was an unestablished officer and was due to retire from the service on April 6 on age grounds.

Mr. Welch entered the Post Office Telephone Service in 1904 and held the position of Night Superintendent until just after the war, when he was transferred to the day staff as Service Superintendent of the East section. He held this position until his death.

As a young man he was a keen footballer and in later years was an enthusiastic supporter of the Blackheath Rugby Football Club. For nine years he was secretary to the Leigh Road Baptist Church at Leigh-on-Sea, where his loss is keenly felt.

The interment took place at Sutton Road Cemetery, Leigh-on-Sea, on Mar. 20, and was attended by several representatives of the Department, including Messrs. Beaumont, Gray, Tree, Ware, and West.

* * * *

Sports Notes L.T.S.

Football.—The final match of the season was played on April 13 at Chiswick against the Taxes and was won by 3 goals to two. The run of the game favoured the L.T.S. who led by 3 to 1 until the last minute when Taxes succeeded in registering their second goal.

The match against Dollis Hill on the previous Saturday ended in a draw of 1 goal each, and as the Dollis Hill team are well in the running for the championship it was quite a good performance. As we had previously beaten the same team at Chiswick, inflicting upon them their only league defeat of the season, the loss of 3 out of the 4 points at stake may ultimately affect their prospects of winning the league.

Bowls.—It is hoped to open the Chiswick Green on Saturday, April 27.

At a committee meeting of the London Area section representatives held on April 10 it was decided to request all players to wear brown shoes with rubber soles, as is the custom on most other greens. This request, which will probably be embodied in the rules, has been decided upon as the result of representations made by the Chiswick Sports Council.

The practice adopted last year of making a collection at the end of the season on behalf of the Green Keeper will be continued this year.

Hand books will be ready for members by the end of April or beginning of May. The closing date for entries for the Civil Service Championships, to be held at Chiswick in August this year, is May 13, and entry forms may be obtained from J. A. Dickinson, KD.2A, Cornwall House, City 2000, extension 279.

Tennis.—Each year a greater enthusiasm for tennis is manifested. This year the London Telephone Service Sports Association is arranging for two Tennis Competitions, a "Singles Competition" for which it is hoped a trophy will be forthcoming, and the "Teams Competition," for the Cup presented by Miss Cox, and at present held by last season's winners—A.R.7 of the Controller's Office.

Cricket.—Civil Service Women's Cricket Association.—It is hoped to commence play at the Civil Service Sports Ground on Wednesday, May 1.

Practice at the nets Mondays and Wednesdays. Matches arranged for Wednesdays.

Applications for membership should be made to: Miss D. Simmonds, Ministry of Health, Kew, Surrey.

THE LATE CAPTAIN W. L. C. RATHBONE.

THE many friends and colleagues of Captain W. L. C. Rathbone, M.C., A.M., were greatly shocked to learn of his death, on Feb. 18, at the early age of 47. A very popular executive officer on the Accounts Branch, he was apparently in perfect health less than a week earlier, when he played a strenuous game in a table tennis tournament, and his death from pneumonia, after a few days' illness, came with tragic suddenness.

Captain Rathbone was an old member of the Civil Service Rifles, with whom he served throughout the war. His war record was a brilliant one, and he was awarded the Military Cross and the Albert Medal, besides being several times mentioned in despatches. He also held the Territorial Force Efficiency Medal. Prior to the Great War he had already seen active service, as he joined the Volunteers at the age of 16, and at 18 was fighting in South Africa in the Boer War. For his service there he held the South African War Medal with 2 bars.

In Muswell Hill, where he had resided since his marriage in 1911, he was one of the most popular and active members of the Muswell Hill Golf Club and had secured many trophies.

The Controller was represented at the funeral at the Great Northern Cemetery, and a number of his colleagues from the London Telephone Service and old comrades from the Civil Service Rifles were present.

W. M. E.

SCENE FROM THE TELEPHONE PLAY. ["*Daily Mail*" *Copyright.*

THE TELEPHONE PLAY.

IT is proverbial that history repeats itself, and members of the London Telephonists' Association are accustomed to look upon the triumphant success of the Telephone Play—which has become an annual institution—as a matter of course. Miss McMillan's Play, "Telephone Tangles," given in St. George's Hall on April 4 and 5 last, more than justifies the faith that is in us. "The best ever" is the general verdict, worthily supported by a crowded and enthusiastic audience on each night of the play.

Briefly, the story is this: The President of The International Telephone, Telegraph, Television, Teletouch, Teletaste, and Telesniff Corporation (Mr. Beale) resolves to eliminate girls from the service of his Company—though there is an important exception in the person of a certain Supervisor (Miss Price) whom he means to retain at all costs and engages as his Shorthand-Typist. The scheme of elimination—clearly foredoomed to failure—runs counter to certain love affairs between two of his Managers (Capt. Hemsley and Mr. Whiffen), an engineer (Mr. Williams), and three of the telephonists, Phyllis, Joan, and Pamela (Miss Street, Miss Tilling, and Miss Latimer). But Love, of course, finds a way. At the suggestion of one of the lovers all the girls, on dismissal, dress up as boys and offer themselves for employment as Engineers' Assistants. The President accepts them at once, to the joy of the lovers; but the secret is soon revealed by the unduly tender solicitude of the lovers for their "Assistants'" welfare. The President, in a rage, tells his Managers that if they wish to justify their action in re-introducing the girls they must make a success of the Television apparatus, invented by one of the Managers, which up to this point had been a dismal failure. By the chance movement of one of the wires of the apparatus, one of the "Assistants" rectifies a fault in the design of the Television equipment, which now works perfectly. The President is summoned in triumph; but in using the apparatus both he and the Inventor see, to their horror, the beloved one apparently engaged in a convincing flirtation with someone else—a very timely reminder of the possible results of a really perfect Television scheme! In the language of the "Movies," both register despair. By way of a diversion, one of the "Assistants" tries the effect of the Television apparatus on the Sun. Instantly there is an explosion and the mechanism is wrecked—not altogether to the regret of those who have used it. Its success, however, has been demonstrated; and the President, in accordance with a promise he had made in such an event, invites the staff to his country house. Here, of course, all the tangles are unravelled. The secrets revealed by the Television apparatus are explained away to the mutual satisfaction of the lovers—the President included, and the inevitable happy ending justifies the whimsical conclusion of the Author:—

> Though as a general rule, no doubt,
> Falsehood's wrong—if you're found out,
> Now and again you'll score, forsooth,
> If you can sometimes dodge the truth!

The amusing story was told with a humour and literary skill which always characterise Miss McMillan's work. Equally admirable was her selection of the music to which the lyrics were wedded, while both soloists and chorus excelled themselves. Miss Street (now Mrs. Blair-Jones), whom everyone was delighted to see in her accustomed part of the principal soprano, sang with all her old brilliancy and charm. Excellent, too, were Miss Latimer and Miss Tilling; while Miss Peggy Murray, as a farmer's boy, received special and well-deserved recognition for her most artistic rendering of the song "Leanin'." Miss Price took the part of the Supervisor with unfailing skill and humour; while Miss Jones again delighted the audience with her exceedingly graceful solo dancing. Of the men, Mr. Beale very ably sustained the part of the President, while Capt. Hemsley and Mr. Whiffen sang brilliantly throughout, the duet, "Vagabonds," being specially noteworthy. Excellent, also, was Mr. Williams as the Engineer; while Mr. Cherry covered himself with glory in his stage effects, the Television phenomena being admirably presented. All were glad to see Mr. Beck once more in the Telephone Play before his transfer to the District Managership of Exeter. He took the part of the Doorkeeper in an amusing "Lift" scene which preceded the first act, with his accustomed skill and humour. As in previous years, Miss Garvey at the piano proved herself to be an admirable accompanist, in which work she was ably assisted by the Misses Woodman and Beecroft; while the success of the play as a whole is another tribute to Mr. Pounds' abilities as a producer.

At the conclusion of each performance the pleasure of an enthusiastic audience was attested by calls for the Author and the presentation of the usual tokens of appreciation, in response to which eloquent tributes were paid by Author and Producer to the admirable work of the Cast, and to Mr. Cherry for his excellent treatment of the stage effects. Altogether the Play was an outstanding success, of which all concerned in the production have reason to be proud.

WHERE TO STAY.

GLASGOW TELEPHONE NOTES.

How to Complain.

"IF I was well I don't think I would have sent in this complaint. Perhaps the girl who attended the phone is not well herself. If that is so I am very sorry I have sent in this complaint." (Extract from a subscriber's letter.)

An Appreciation.

"As your staff often get 'kicks' I think they should also get the 'ha-pence' when due, and I wish to congratulate you on a very smart operator.

On Sunday evening about 6.5 p.m. I was about to catch the 6.10 train, when I found I had left a special book at home. I rang up my *house* from the call-box at the Station, but wife, family, and maid were all out and there was no reply. The operator asked if she could give a message—such a thing several years ago would have been looked upon as 'inhuman'—I was rather amazed, but gave her the message, and received the book next morning at 8 a.m.

What the operator did may have been a little out of the usual, but I wish to congratulate you on training your staff to be of service where possible, instead of being mere 'plug punchers.' The girl on duty certainly deserves a word of praise, and no doubt you will see that she gets it, as if rebukes are given, praise is due when deserved."

And so say all of us!

Mr. C. S. Scantlebury commenced his training as an Assistant Traffic Superintendent on April 10.

We welcome him from distant Plymouth, and trust that his sojourn in Glasgow will be a happy one and hope that any regrets he may feel at leaving the sunny South for the colder North will be more than offset by his experience here, and that memories of Devonshire Cream and Cider will be dimmed by the delicacies of the Land o' Cakes.

Contract Branch Notes.

Development.—An entire re-study of the Glasgow Local Fee area for Automatic purposes has just been concluded. On completion of this work the following officers on development allowance duty were released for similar work in other districts: To Newcastle, Mr. J. F. Brodie. To Liverpool, Messrs Jas. Blackwell, R. H. Wilder, and A. E. Dickson. We shall miss these colleagues but as they are only "on loan" we hope to welcome them back *if* an armistice is declared on "development." Still, some folks have a bad habit of retaining borrowed articles, and England may not be in a hurry to return the Scots.

Increase of Staff and Promotion.—Authority has been obtained to increase the establishment of Contract Officers to 22 Class II, and 3 Class I posts. The third Class I vacancy has been filled by the appointment of Mr. S. W. Russell who has, as Acting Class I Contract Officer during the past nine months, supervised the automatic development squad with conspicuous success.

Our congratulations and good wishes to Mr. Russell on his well-earned move to substantive rank.

LIVERPOOL TELEPHONE NOTES.

IT is with the deepest regret that we announce the passing of Miss Rose O'Malley, Bank Exchange. Her activities covered many spheres. She was a great worker in the cause of charity, and those who suffered misfortune or illhealth found in her a devoted friend. One never appealed in vain to Rose for assistance in a good cause, and the loss of her presence will be keenly felt. A lover of flowers, she carried them into the Switchroom, and the care she bestowed on the plants year in year out, brought brightness into the exchange. She was for many years a member of the Central and Bank Dining Committee and of the Fines Fund.

The funeral took place at Anfield Cemetery, Requiem Mass being held at St. Charles Church. The wealth of floral tributes received from the Postmaster-Surveyor and Exchanges reflected the love and esteem in which Miss O'Malley was held by her colleagues. We offer our sincere sympathy to her mother and sisters in their great loss.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 100.)

1879, Mar. 12 ... (Edwin Clark originated the "Britannia" joint for wire connections. M'Intire, U.S.A., introduced the sleeve joint. Chatterton introduced a mixture of resin, Stockholm tar and gutta-percha for insulation purposes.)

Moseley introduced a battery with zinc in sea-water and tinned copper in sulphate of lead paste.

(Sir William Thomson and Trouvé also constructed batteries.)

1879, Apr. 1 ... Charge of 2½*d.* for advice of delivery of a foreign or colonial registered letter introduced. Number of registered letters reached 9,000,000.

Sir William Siemens suggested that the electric arc might be used in the fusion of metals and constructed an electric arc furnace.

The Bell and the New England Telephone Companies combined as the National Bell Telephone Company.

1879, Apr. 29 ... Edison's loudspeaking telephone exhibited to the Royal Society. Experimental exchange opened at 6, Lombard Street, London.

1879, June 11 ... Sandford Fleming, of Canada, suggested that "British possessions to the west of the Pacific Ocean should be connected by submarine cable with the Canadian line."

1879, June 21 ... Alexander Marr, of Manchester, patented a granular carbon telephone transmitter with a pine diaphragm.

International Telegraph Conference held in London.

1879, Aug. ... First English telephone exchange opened at 36, Coleman Street, London, with a two-panel "Williams" switchboard.

Telephone exchanges opened in Glasgow, Manchester, Liverpool, Sheffield, Edinburgh, Birmingham and Bristol.

1879, Aug. ... Edison Telephone Company of London Limited, registered.

1879, Sept. ... Edison Telephone Company's exchange opened at 11, Queen Victoria Street, London. Subscribers used carbon transmitters and chalk receivers.

Baudot admitted to Legion d'Honneur.

Oliver Heaviside suggested introducing "leak" circuits and self-induction into cable lines.

Cavendish's hitherto unpublished papers on electricity edited by Professor Clark Maxwell.

1879, Nov. 5 ... James Clark Maxwell died.

Sir William Fothergill Cooke died.

1879, Nov. 7 ... E. R. Graves, Post Office Engineer-in-Chief, and W. H. Preece, inspected the Coleman Street Telephone Exchange.

Edison constructed an electric lamp with a carbonised brown-paper filament.

Electric motor tractor used for ploughing at Sermaize.

1879, Nov. 29 ... C. E. Scribner patented the Universal Telephone Switchboard (manufactured by the Western Electric Manufacturing Company.)

1879, Dec. 13 ... M. D. Connolly, T. A. Connolly and F. J. McTighe, of U.S.A., patented the first automatic telephone system.

(S. A. Varley devised the "Mill," a type of automatic switch.)

Eastern and South African Telegraph Company subsidised (£55,000 per annum for 20 years) by the British, Cape and Natal Governments for the cables from Aden to the Cape.

Eastern Extension Telegraph Company obtained subsidies (£32,000 per annum for 20 years) from the Australian Government for maintaining communication with Australia, including the duplication of the Penang-Australia cable.

Atlantic cable laid between Brest and St. Pierre for Compagnie Francaise du Telegraphe de Paris á New York.

1879, Dec. ... D. E. Hughes experimented in wireless telegraphy.

Post Office Savings Bank depositors 1,889,000, value of deposits, £29,000,000.

1880, Jan. 1 ... Rates for Colonial Money Orders reduced to the same as those for foreign money orders.

1880, Jan. 8 ... Lake's telephone transmitter patent assigned to Francis Blake.

1880, Jan. 14 ... Louis John Crossley patented a telephone receiver in which only one pole of the U-shaped magnet was fitted with a wire coil.

1880, Jan. 29 ... G. Westinghouse, of Pittsburg, Penn., patented an automatic telephone system.

W. Johnson constructed a telephone transmitter containing three carbon pencils. A shunt resistance coil was attached to prevent the circuit being broken if the pencils were displaced, and to obviate excessive sparking if the current were too strong.

Marr produced his "Inertia" telephone transmitter.

Dolbear invented a condenser telephone receiver.

John Trowbridge experimented, at Harvard, in wireless telephony and suggested communication between ships.

First Irish telephone exchange opened in Belfast.

First English trunk telephone line opened between Leeds and Bradford.

1880, Apr. 26 ... First printed list of telephone subscribers issued containing names of subscribers in London and upwards of 16 provincial towns.

1880, May 13 ... The two London Telephone Companies amalgamated under the title United Telephone Company of London.

W. Spottiswoode constructed a giant induction coil in which the secondary circuit contained 280 miles of wire, wound in 340,000 turns, with over 100,000 ohms resistance.

Ayrton and Perry measured the difference of potential for different pairs of metals.

Professors Ayrton and Perry designed an electrical energy meter. Dr. Aron, of Berlin, modified and improved it.

Professors Ayrton, Perry and Fleming Jenkin constructed an electric telepherage railway, in which the cars are suspended, at Glynde, Sussex.

Preece calculated the current necessary to fuse wire. He proposed calling the unit of electric power a "watt."

(H. R. Kempe, who was engaged for a period of nearly two years in the laboratory of Sir Charles Wheatstone, invented a means of measuring the internal resistance of a battery, and designed a special shunt compensation box.

Mance introduced another method of measuring internal resistance of batteries and Dr. Muirhead modified Kempe's system.)

(*To be continued.*)

PRESENTATION TO MR. BECK.

To part with a colleague is seldom pleasant; but the ceremonies attached to these partings are often the occasion of so much good-will that we can sometimes say (as Juliet nearly said):—

"Parting is such sweet sorrow,
I could say good-bye until to-morrow."

This thought was particularly with us when, on April 11, the colleagues of Mr. T. A. Beck gathered—in large numbers—to bid him farewell and to wish him good luck on his transfer to Exeter to take up the appointment of District Manager.

The Controller, presenting Mr. Beck with a sideboard subscribed for by his many friends in the service, said that our loss would be the Provinces' gain (reminding us of a somewhat debatable Scottish saying, "It's no' lost what a friend gets!"). He said that he had been connected with Mr. Beck for thirteen years, and had had plenty of opportunity of observing his high qualities and capabilities. He spoke, too, of Mr. Beck's genial personality, reminding us that only recently we had seen Mr. Beck as a very successful commissionaire in the Telephone Play.

Mr. Beck, who seemed quite unmoved when reference was made to his future proximity to Dartmoor, said that he was leaving London with mixed feelings. He would always remember the happy days he had spent in the London Telephone Service. He had tried to make his slogan "Look after the staff, and the staff will look after the service." This was received with loud applause—evidence, no doubt, of Mr. Beck's successful carrying out of the slogan.

For our part, we hope that Mr. Beck's rapid rise in the "Telephone Play" from the post of a humble doorkeeper to that of no less a being than the Sun God, may be symbolic of his future progress in the service, and that he will soar, from the role of an unassuming Superintendent of Traffic to that of—well, whatever the equivalent of a Sun God is in the service.

J. McM.

THE

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXV.

MR. E. J. GAYES.

MR. E. J. GAYES, the Surveyor of the North Midland District, after being appointed to the Accountant-General's Department, took up service in the Secretary's Office, became an Assistant Surveyor in 1899, and has now been a Surveyor for nearly ten years.

The Postal Service, by reason of its magnitude, must necessarily take the premier place in the cares of Surveyors, and, in days gone by, the majority of Surveyors were content to leave the oversight of the Telegraph and Telephone Services largely to their assistants. Their successors of the present day, however, take a very active interest in the technical services, and Mr. Gayes, in his sphere, has contributed much to the substantial progress of recent years.

Mr. Gayes has the priceless gift of a merry heart, and that may be one of the secrets of his abounding energy.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

V.—BY AN ENGINEER.

[NOTE.—*The Editorial Board takes no responsibility for the views expressed in this series of articles.*]

"How to Improve the Telegraph Service" is a subject that may be dealt with in several ways, all of which are of importance. The chief consideration will be the improvement of the telegraphs as a public utility service. The conditions of employment of those engaged in the industry are also an important factor. Finally, there are the improvements to be envisaged as a result of scientific and technical development, such, for example, as the substitution of printing to replace hand-worked systems of telegraphy, &c.

It is right that the subject should be examined from these three angles.

The public user of the telegraph system requires that the service should be speedy, accurate, and reasonable in cost. It is fair to say that, in general, there is no complaint made in regard to the speed of signalling. Telegrams can be dealt with, at any rate on our most important circuits, at a speed of working that meets all reasonable requirements. It must be admitted however, that delay in disposing of traffic at busy periods is a serious one and it cannot be claimed that a telegram is dealt with as it should be, when delays exceeding 30 minutes are recorded on main channels working to and from London. The writer was told a few days ago of a business man who handed in a telegram at Euston Station, ordering his motor to meet him on arrival at Birmingham. The sender reached his Birmingham office, over 100 miles away, before the telegram was delivered. This incident is not an isolated one.

The restriction in the number of telegraphic channels, by cutting down the staff to the lowest economical limits, is partly responsible for these delays and, as a result, the service is losing the confidence of the public as a speedy means of communication.

The system of delivering telegrams by "walks" has also given the public the impression that the ideal of speedy despatch of telegrams has been dispensed with. It is, of course, a different matter when the addressee is connected by telephone to the telegraph office and the written message is delivered as a confirming document, subsequent to dictation by telephone. But to regard a telegraph messenger as a miniature postman is foreign to the basic idea of the service and this arrangement detracts from the value of the telegraph. Rapid transmission by skilled operators is somewhat farcical when delivery is delayed until a messenger's load has been accumulated for a "walk." It is immaterial to the sender and recipient whether delay to a telegram occurs at the handing-in office, a transmitting office, the receiving office, or on the "walk." It is absurd to rush a message from Glasgow to London in 5 minutes and then inordinately delay its delivery, in order to save expense on the least costly portion of the service.

It is considered that the arrangement of dictating telegrams by phonogram should be given much wider publicity. The telegraph and the telephone should work hand in hand in this and in other respects, and the public should be made aware in every possible way of the value of the telegraph service. One visits post offices up and down the country and finds the walls of public offices displaying advertisements of insurance companies and business houses, but one looks in vain for any special reference to the telegraph service. It seems to be past praying for! Could not the Postmaster-General make it a rule that wherever advertisements are displayed in post offices there must be a prominent position reserved for a framed poster, calling attention to the advantages and conveniences to the public of the telegraph service? The Empire Marketing Board has indicated very successfully what can be done by a public department in demanding that we should "Eat more fruit" and "Drink more milk," and there is no reason why a determined effort should not be made to tell the public that they *must* "Use the wire!"

It is the rule to charge for telegrams on a flat-rate basis; to deal with the message in a similar way to that of letters or parcels sent by post, whereas in the case of the trunk and junction telephone systems calls are charged for in zones—the longer the distance, the greater the cost. It is worthy of consideration whether such a system of charging should not be introduced for the telegram and greater regard paid to running the service on business lines. There appears to be justification for a differentiation in the cost of a telegram from London to Stornoway and one from London to Croydon. The introduction of a zone system of charging might also be accompanied by a reduction in the charge for social and local telegrams; say at the rate of 8 words for 6*d*.

It must be confessed that there is a certain feeling of discontent pervading practically all the grades employed in the telegraph service. This discontent is due in large measure to lack of prospects. Whilst the telephone service is expanding in every direction, telegraphists see *their* department contracting each year and, as a result, the number of higher appointments reduced. The manipulative work tends to become a matter of routine and in the course of years the operator is so expert that he is able to perform his work with a minimum of effort. This is not to say that the work is unskilled or unimportant. It requires close attention and alertness, but in this, as in other matters, practice makes perfect, and an experienced operator is able to perform his duties with a certain subconscious control that tends to make the work mechanical.

It is essential that the outlook of the telegraphist be changed and feelings of co-operation and *esprit de corps* introduced, otherwise the present tendency to apathy will continue, to the detriment of the service and those connected with it. How can this be effected? In the writer's view, telegraphists should not be retained as operators throughout their whole term of service. They should be encouraged to study such subjects as Accounting, Economics, Electrical Engineering, Languages, &c., and places found for qualified men in other departments, either by nomination or examination. Ten to fifteen years should be the normal maximum period for employment as an operator and, during that time, the officer should be equipping himself in some form or other for progress in his own or in other departments.

Telegraphists quickly obtain knowledge of the general working of the Post Office; they are subject to discipline and control, and acquire what is known as "The traditions of the service." This good material, caught young, would be of value in other departments and, if opportunities of advancement were afforded, the writer believes that a new spirit would be created and the staff take a more personal pride in the business.

There are two matters allied to the operating arrangements that should be mentioned here and, although difficult to overcome, should be discussed frankly in an endeavour to find a solution. In the case of busy commercial circuits, continuity of manipulation by the same operators is of great advantage. The telegraphists become conversant with any variations of the electrical circuit, the nature of the traffic dealt with; also the operators at each end of the circuit become acquainted with each other. These factors make for smooth and efficient working.

There is also the thorny subject of payment by results. In the writer's view, something should be done to reward good work on busy and important circuits. If a bonus or allowance is objected to, then some other form of recognition such, for example, as more regular duties, or a Saturday half-holiday, might be con-

EXTRACT from "THE TIMES."
8th May, 1929.

HAND-COMBINATION TELEPHONES.

AN IMPROVED TYPE.

The design of the modified type of telephone, to which the Postmaster-General recently referred in the House of Commons, has now been fully worked out by the Post Office engineers and an order for a substantial number has been placed with a London manufacturer. It is a reversion to the hand-combination type, superseded 20 or 30 years ago by the pedestal type of telephone now in general use, but greatly improved.

A considerable section of the public has constantly shown a preference for this type known by the Post Office as the microtelephone, and it has been retained in some European countries for that reason, though its efficiency has been found to be 15 per cent. or more below that of the pedestal instrument. The recent change in the situation has resulted from the development, in the research department of the Post Office Engineering Department, of a new type of transmitter, which, when mounted in a microtelephone, apparently secures and maintains the full talking efficiency of the standard pedestal instrument. This new transmitter receives the acoustic energy of the voice upon a light but rigidly constructed diaphragm having an elastic edge, instead of upon the uniformly flexible diaphragm hitherto employed to impress the varying pressures of the air waves of speech upon the small box of carbon granules, which, by consequent changes in resistance, impresses corresponding modulations upon the electric current conveying and reproducing the speech at the distant end of the line. The external form of the new set closely follows a design recently produced by the American Telephone and Telegraph Company and brought into service by the American Bell Companies. The base and cradle of the instrument and its electrical circuit, however, depart widely from the American design and are thought to embody practical points of superiority. The new instrument will be applicable both to the manual and the automatic exchange systems. All that is required to adapt it to the automatic system is the addition of a calling dial to a fitting provided in readiness for it on the base of the instrument.

The microtelephone set is necessarily of more expensive construction than the standard pedestal set, and its maintenance cost will also be greater. The Post Office is therefore faced with a position of some difficulty. It has very large stocks of the existing standard instruments, and more than 1,000,000 sets are now in use. It would be a very serious matter financially if the bulk of these instruments were thrown back upon the hands of the Post Office by a widespread demand for the new instruments, particularly as for desk work the pedestal type has long been regarded as the most efficient design obtainable. This difficulty has been met in America by the imposition of an additional rental charge of 50 cents a month, equal to about £1 5s. a year, for the use of a microtelephone set. It is probable that the American example will be followed and the Post Office will make an extra charge when it places the new instruments in service in this country.

sidered and, in the case of able, energetic telegraphists, opportunities for more rapid advancement offered.

The telegraph system of this country has been built up in stages over a number of years, as a result of scientific and technical development, designed to meet the traffic requirements. The policy underlying all operations has been that it is first and foremost a public utility service, available for the convenience of all: from the city merchant to the inhabitant of the smallest village in the Kingdom. Bearing these facts in mind, it has also to be remembered that the type of telegraph instrument installed in a village post office is of a different kind altogether from that required to connect two busy offices. As a result of gradual development, there are many different types of apparatus in use nowadays, ranging from the Single Needle, the Wheatstone A.B.C., to the latest form of Teleprinter. This multiplicity is very marked in large instrument rooms and operators are called upon to manipulate Morse, Baudot, or Teleprinter apparatus. This duplication also leads to increased maintenance costs.

There are indications of a considerable expansion in the use of Teleprinter apparatus in the British Post Office. This machine has been developed into a highly efficient and reliable instrument and may be compared in its operation to a modern motor-car. Although both the motor-car and the Teleprinter may be regarded as highly developed engineering products, they cannot give the best service unless handled carefully and intelligently, with a whole-hearted desire to secure the best results from the use of the machines.

It would appear that the time is opportune for a thorough-going standardisation of apparatus. The use of the phonogram service should be extended so as to cover all the smaller telegraph offices and, where the traffic exceeds a certain daily maximum, and where electrical power is available at reasonable cost, Teleprinter apparatus should be used. The writer is of the opinion that the Teleprinter should be regarded as *the* standard instrument for ordinary telegraph purposes and that it should replace all Morse. Baudot and other printing systems for inland working.

The Teleprinter has a standard type of keyboard that can be operated by a typist without expert knowledge of other forms of signalling. Operating costs will be reduced by the employment of typists for the work. In addition, arrangements should be made to associate the apparatus working between busy centres with Voice Frequency, or Composited Systems, and by this means the cost of line provision reduced to a minimum. The substitution of Teleprinters will justify a more generous provision of unified spare apparatus, tuned up and ready for use at the point required, so that if any mechanical defect occurs on a working set, the instrument can be changed within a minute or so and traffic delays avoided. It is also an essential part of this proposal that one or more mechanics, with expert technical knowledge of the apparatus, are available in each engineering section and also that there should be a scheme of periodical overhaul and adjustment of instruments at a mechanics' workshop attached to the Engineering District Headquarters. Stability of operation would thus be ensured and contact maintained with telegraph offices throughout the Kingdom through the co-operation of official motor transport services.

It is essential also that greater regard be paid to the requirements of the telegraph service on the part of Inspectors and other controlling officers in the Engineering Department. Specialised knowledge of telegraph apparatus should be regarded as a requirement in the case of one Inspector at least in each engineering section, in order that he may efficiently supervise the mechanics and other workmen engaged on telegraph duties and be ready to give expert assistance in case of need.

[The next article in this series, which will appear in our July number, is by a provincial Chief Superintendent of Telegraphs.]

THE CONTRACT OFFICER AND THE CALLING RATE.

BY R. S. GROSVENOR, GLOUCESTER.

As commercial representative of the department, the Contract Officer is required to traverse the highways and by-ways in search of new business, interview existing subscribers regarding additional facilities, and visit subscribers who have given notice to cease their connexions, using every endeavour to retain them.

Smart appearance, good address, unlimited tact, careful discretion and a persuasive manner, combined with full confidence, are essential assets to a successful Contract Officer.

That the Contract Officer *is* successful, the consistent increase of new lines and stations amply proves.

A life full of variety, daily meeting many types and classes of the community, one visit calling for an interview with the head of a large firm, the next with someone in a small business, followed by a call on a lady of leisure.

A revenue-earning officer, a telephone pioneer, ever breaking new ground, sowing seeds of business and tending those seeds with great care, watching and waiting until the plants have grown so that in due time the harvest of orders is gathered. Such is the Contract Officer's duty—one day encouraged by success, the next day doomed to disappointment.

An officer engaged on this duty should know as much as possible about the goods he has to sell, i.e., the telephone service generally.

Facilities for obtaining this knowledge should always be readily available and every assistance given by other branches of the telephone service to attain such knowledge.

It has to be kept in mind that the Contract Officer, in obtaining new business, is in touch with the public at the very commencement of telephone education. First impressions go a long way and are lasting. It is therefore essential that the prospective subscriber should always be given the fullest information not only with regard to tariff, fees, &c., but as to the many facilities the service offers. It is an impressive fact that, at the moment, the mere fitting of a telephone provides the possibility of speaking to about 26 millions of persons. Again, prospective subscribers would perhaps frequently be more readily convinced if given an indication of the value of the plant (internal and external) which has to be provided for an individual exchange connexion. This initial cost varies somewhat between one area and another but a general figure is £40 to £50 per line. These costs include subscriber's apparatus, subscriber's line plant (with the commensurate spare plant) and exchange equipment individual to the subscribers.

The essence of good business is to obtain an order in such a manner that a repeat order is certain to follow. This axiom especially applies to the use a *new subscriber* will make of the service.

It is our business to see that subscribers make *maximum use* of the service. The way in which an interview is conducted and the various facilities presented has a very important bearing on the use that will be made of the connexion.

In many cases an order is obtained because a person has a specific use for the telephone, or is persuaded that such is the case, but if a definite knowledge and impression of the excellent facilities always available are left behind, then the order obtained will be considerably enhanced in value.

The Contract Officer is, of course, fully conversant with all the facilities of the telephone service, but it is well to mention the necessity for keeping the following lesser-known services in

mind, viz.: originating and receiving telegrams, cablegrams and radio telegrams, express letter and telephone letter service, Post Office express messenger service.

There is no doubt these very useful services would be utilised considerably more if they were better known and thus be of much greater advantage to subscribers and the public generally, with consequent additional revenue to the department.

The importance of visiting existing subscribers, both business and residential, with a view to obtaining agreements for extension facilities of all kinds cannot be too strongly emphasised. The more telephone facilities there are installed at subscribers' premises, the greater the calling rate will be stimulated.

The country at the subscriber's elbow from a telephone in the private office at business, or in the study at the house, thereby giving opportunity for immediate use, undoubtedly means more calls being originated than would otherwise be the case.

Generally speaking, it should not be left for subscribers to enquire for particulars regarding extension facilities. Such business should be sought at every opportunity, and experience shows that good results will certainly accrue. It is not only the additional rental revenue obtained, but the important bearing such increased facilities have on the calling rate, that is an essential factor.

Again, the Contract Officer when interviewing subscribers sometimes receives complaints of various kinds. In such cases, the matter should be reported without delay to the proper quarter, all available details being stated, in order that full attention may be given and thus prove to the complainant that the Department is determined to maintain a thoroughly satisfactory service.

When visiting subscribers, the Contract Officer can do much to foster and stimulate the use of the service.

This leads to that part of a Contract Officer's work dealing with "Notices to cease," which requires no emphasis here as to its importance.

Notice to cease is given by subscribers for a large variety of reasons, and the returns show how well these are generally overcome by the Contract Officer and the fatal notice withdrawn.

In many instances, having obtained withdrawal of the notice, a further step can be taken and increased use encouraged by impressing upon the subscriber the value of the service *as applied to that particular case*. No opportunity of doing this should be missed. Full confidence in the utility of the service should be imparted wherever possible.

The point of view of the Contract Officer, not only to secure an order or retain a connexion, but to keep in mind that it is essential *increased use* should be encouraged, will considerably help to induce a higher calling rate.

THE RURAL AUTOMATIC EXCHANGE.

BY H. E. P.

THE first Rural Automatic Exchange of a new standardised type was opened at Haynes, near Bedford, on the 4th of February, 1929.

It may seem premature to pass comment upon the behaviour of so recent an innovation, but it can be safely recorded that climatic conditions, at least, have fully tested the Haynes equipment.

Since its opening, every variety of the English weather has been experienced from blizzards to mild steamy heat. Ice could be scraped off the walls inside the building during the installation of the apparatus when fourteen degrees of frost were recorded. From a climatic point of view, therefore, this new type of equipment leaves a mere traffic man wondering why the hygrometers and thermometers which are so prominent in automatic exchanges should not be presented to the operating staff, for the telephonist certainly cannot withstand the temperature variations of Rural Automatic Exchange equipment.

The first exchange of this type has been a noteworthy success; and there are no indications that there will ever be, from the service side, any other comment to make regarding it. The second rural automatic exchange in the St. Alban's Telephone District was opened on May the 1st, and beyond a slight difficulty through a caller failing to press button "A" on the Hall Multi-Coin Box and thereby unduly holding the junction to the parent exchange, no untoward incident has occurred.

It is quite a simple task to operate the calls at the parent exchange, once the habit of trying to answer without depressing the Coin-box Tone Key is overcome. The engineer who designed the circuit so that nothing can be heard until it is depressed was a psychologist.

The non-standard ringing tones in actual practice give rise to no confusion. As everyone knows, there are, as far as the average subscriber is concerned, only two tones. The first is a noise like a generator which causes him to conclude that the other subscriber is being rung; the second sounds like a regretful and apologetic tone, which leads him to conclude that the call is ineffective for reasons generally not understood, and he tries again later. The beautiful rhythmic differences between a "number unobtainable tone" and a "busy tone" are, as a rule, lost on the lay ear: As for the "dialling tone," half the subscribers never wait for it; "if at first they don't succeed" they try again. Therefore, when the non-standard Rural Automatic Exchange tones were first heard, they were sufficiently similar to the standard "ringing" and "busy or number unobtainable" tones to cause no confusion. Of course, some subscribers do remember the careful instructions of the visiting officer.

The routine of R.A.X. transfers has now reached a final stage but there are still one or two features which will appear when new conditions occur. The two-outlet R.A.X. will give rise to routing problems which are not so formidable as novel. Switchboard notices will probably dispose of all these cases. There will be a Hall Multi-Coin-box for which tickets may be prepared at two exchanges, and the Accounting Departments will have a merry time with "discrepancies" though not by any means is this a difficult problem to solve.

Another feature arises in connection with emergency calls for Fire, Police, and Ambulance. The "2222" standard number for automatic exchanges has been adopted in this District for R.A.X.s also, in so far as "22" has been reserved on all R.A.X. equipments even if there is no local Police or Fire number, so that at a future date, this number can be assigned to the Police when required. All calls for "Fire" are thus connected to the local Police who are best able to determine the boundaries of brigade areas, and it is a responsibility beyond the Department's function to select the particular brigade applicable. If no response is obtained from the "22" number, the subscribers instructions notify them that by dialling "0 1" they can always obtain assistance. A "no reply" from "22" numbers is not out of the question in rural areas when the local police officer is on patrol duty. In areas where there is no local police officer, the question arises whether the "22" numbers should not be jumpered on the outgoing side so that if "22" be dialled the call nevertheless reaches the parent exchange. This would allow of the standardisation of "22" for Fire, Police, and Ambulance calls.

It is not difficult to see that an extension of the Rural Automatic Exchange system would change the character of telephone working in country areas. Amongst other things, however, it would cause a loss to the local traffic staff of that peculiar charm of the rural exchange where the sub-postmaster is the friend and Adviser-in-Chief of the community.

TELEGRAPHIC MEMORABILIA.

"*Certa Cito,*" is the recently sanctioned motto for the Royal Corps of Signals. What could better express the telegraphic ideal than, "Swift and Sure"?

To those regular readers of the *Telegraph and Telephone Journal* who may happen to open their June copy at this page and at the same time may open their eyes with mingled surprise, regret, or perhaps even with relief, I would request such to kindly turn to a leading article of this issue for the explanation of the apparent—it is only apparent—curtailment of my monthly contributions to these pages. *Revenons a nos moutons*!

The growing need of the nations of the world for direct telegraphic and telephonic communication with their colonies and foreign agencies is almost daily evidenced. Belgium, for example has just placed an order for a short-wave telegraph-telephone transmitter, with the Marconi Company, for use between that country and the Belgian Congo, and also for communication with South America where she has growing business activities.

Again, the Portuguese Radio Marconi Company has sent a "proposal" to the Minister for the Colonies for the establishment of wireless stations in Portuguese India, Macao and Timor.

In apparent direct connexion with this "proposal" comes the news from China, per Reuter's Agency, that a party of engineers had actually left Lisbon but a few weeks ago to establish a short-wave telegraph station at Macao.

Never before in the history of telegraphy and telephony has there been more solid ground for satisfaction on the part of an administration, than should legitimately exist in the mind of the British Post Office when the above and similar instances are recalled to mind. Whatever may be the results of the future spread of short-wave working in the one case and of Trans-Atlantic Telephony on the other, it is undeniable that the world has followed Great Britain's lead.

The British Post Office is a modest organisation. Probably too modest for its own aggrandisement or even to do itself mere justice. Yet the very solid fact remains that the heavy spade-work in inter-colonial radio-telegraphy and also in Trans-Atlantic Radio Telephony has been very largely performed by the assiduous labours of its officers. I have of course not forgotten the pioneer efforts of the Marconi Company as regards the former service, and the whole-hearted co-operation of the American technicians as regards the latter service. As regards the former, though "others may have entered into their labours," it is true to affirm that the new services have been ably organised, efficiently worked and that to a standard which has earned the praises of not a few of the world's experts.

To those of us who visualise Iceland as a dreary, desolate sparsely populated island, who would have believed that it contained nearly two thousand miles of overhead and covered telegraph and telephone cables, all in full operation and that the last annual return showed an increase of 150 miles over its predecessor?

I have only been privileged to read a condensed report of a paper read before the Indian Section of the Society of Arts, by Mr. A. T. Cooper, M.Inst.C.E., etc., etc., on Telegraphy in India, but even condensing the "condensed," readers will realise how very seriously British officials have been studying telegraph problems in that country these last few years.

The principal improvements in land-line working have been in connexion with long-distance circuits employing high-speed printing systems. Here the use of regenerative repeaters has rendered quadruple Baudot "up and down" working possible over the very longest circuits in use in that country. The report continues:—

> "Specially designed Baudot typewriter keyboards and converted Murray keyboards with tape transmitters have been recently installed on some of the main circuits as a labour-saving experiment, and their operation is being closely watched. On short and less important circuits similar efforts towards saving labour and plant have been made by the introduction of modern types of concentrator switches and of the composite method of Morse working, while in the large telegraph offices, Lampson carriers have been installed for the conveyance of messages to and from the instrument tables."

Despite one's appreciation of the very considerable amount of artistic talent among the Telegraphist craft I cannot recall any picture of note either in a private or public collection which has made the telegraphist or telegraphy an outstanding feature—except for certain war-time sketches. This year's Royal Academy picture of Mr. Fred Roe, entitled "S.O.S." has however filled the gap although the Morse key in the wireless cabin appears to have been placed in a very unconventional position!

A real union of the Telegraphs and Telephones will be found in the projected Trans-Atlantic "Telephone" Cable, which it is stated, will provide Two-way telephone transmission and eight or ten telegraph circuits.

An inscription on a Chinese Vase. If we go forward, we die; if we go backward, we die; better go forward and die.

J. J. T.

GLASGOW TELEPHONE NOTES.

IF a good start is half the battle, then Miss J. B. McLeod, late of the Douglas Exchange, has gone a long way towards the winning post. Miss McLeod has recently joined the ranks of the blest—sorry—and given up her duties with the Department to the more or less onerous responsibilities of wedded life. On Friday, April 19, our colleague had a splendid send-off, and opportunity was taken to "make a night of it." Practically all the Douglas Staff foregathered in the Dining Room for high tea and a social evening. Success was assured from the outset, for the atmosphere was such that pessimism and dull care were rapidly blown to the four winds of heaven. A few brave representatives of the mere male were present at the Concert, and, so far as is known, they stood the experience fairly well; at all events, they are now sitting up and taking nourishment. The single and concerted items were excellently rendered. The presentation of a handsome writing bureau and silver match holder was made by Mr. A. E. Coombs, our District Manager, to which Miss McLeod responded in a suitable and very feeling way. Miss Mortimer and her staff are to be congratulated on the excellence of the arrangements.

We regret to record the death of Mrs. C. Doherty, Telephonist, Central Exchange, on May 6.

Mrs. Doherty had been in indifferent health for some months, but the news of her death came as a shock to her colleagues.

Mrs. Doherty was a war widow, and had been with us about 11 years.

To her two young daughters and other sorrowing relatives we extend our deepest sympathy.

The Department and staff were represented at the funeral by Mr. E. E. Wilkins, Central Exchange Superintendent.

On Organisation.

"An effective division of labour is of the very essence of sound organisation" (Whitley Report). "Organisation is indispensable to growth. And yet too much organisation is indirectly repressive, for it increases the obstacles to those readjustments for larger growth and more perfect structure" (Spencer). "It is possible to over-organise, leaving too little to the stimulus of individual spontaneity, and bringing men of varied abilities and temperaments too near to dead-leveldom." . . . "Scientific management has put discipline on a new footing in allotting it to a functionalised officer, whose mission it is to encourage improvement rather than to penalise shortcomings" (J. Lee). "There is an organisation that tyrannises over character" (Emerson). "Administration is at least as much a matter of heart as of brain" (Report of Reorganisation Committee). "Foster a spirit of encouragement of right methods rather than carry on a campaign against wrong methods which may be out of all proportion to their part in the sum of the day's work" (*Telegraph and Telephone Journal*). "The first duty of supervising officers is undoubtedly that of organisation. If they would expend a fraction of the energy, now consumed in irritating and fussy fault-finding, in serious deliberation of the distribution of staff and traffic, there would be a distinct gain to all concerned" (Lara). "One of the great arts of all persons placed in authority is to multiply themselves, as it were, by a judicious and trustful employment of other men's intelligence and abilities. I am all day long engaged in seeing what other people are doing and can do. To do their work thoroughly, it is especially requisite that organisers should not undertake too much. Success results more from the limitation of effort than from anything else" (Helps). "More thought and less bustle, greater attention to lucidity of mind and less to physical effort and the undertaking of many trivialities, are not undesirable in relation to organisation in business" (Bligh). **For the counsel of Jethro on organisation, read Exodus xviii, 13-26.**

PICTURE TELEGRAPHY.

THE technical press is promising us that, provided we have the necessary receiving apparatus, we shall very soon be able to receive broadcast pictures not from one or two, but from many countries in Europe.

Captain Fulton, it appears, has returned from his European tour during which he made certain arrangements for the regular broadcasting of pictures. The German transmissions commenced last month and probably before these lines are published the necessary transmitting apparatus will have been installed at both Prague and Budapest. Hilversum and Radio-Paris are also coming in on the regular services of the Fultograph System.

From Rugby, at the latter end of April, Stock Quotations, type printed on extra thin paper were fed into a special wireless transmitter and broadcast, while three ships, the *Orvieto*, the *Avilla* and the *Minnewaska*, previously provided with necessary receivers designed by the Marconi International Marine Communication Co. Ltd., while en route between this country and Australia, received the results, ready to be fixed on the respective news-boards of the liners mentioned.

Two years ago a brief description of the "Karolus" System of Picture Telegraphy appeared in the *Telegraph and Telephone Journal*, and this system has been making excellent headway, but not in the same direction.

The Karolus, or to give it its full title the Siemens-Karolus-Telefunken System of Picture Telegraphy, despite its easy adaptability to radio conditions of transmission has rather been utilised over underground, overhead lines, voice-frequency circuits, loaded circuits, etc.

Co-existant with the experiments of M. Bélin in France, those in Germany have also covered a period of about twenty years, always with a view to producing an effective international type of apparatus which should be capable of transmitting messages in any language, irrespective of a knowledge of the language itself or whether the language concerned is capable of being dealt with expeditiously by means of the alphabet of the Western world.

FIG. I.

Fig. I. shows an example of Chinese script as actually received over a long distance circuit. The utility of the system to Japan has not been missed by that wide awake country, and installations are either in situ for working between Tokio, Kioto and Osaka, or are actually in process. The Berlin-Vienna circuit was opened on December 1927, and at the moment, it is actually possible for Press pictures to be exchanged between London, Manchester, Paris and Berlin, Vienna and Cologne.

My latest information is that a speed of about 40 pictures per hour has been reached.

Should this be correct and should this rate even be exceeded, perhaps doubled in the future, we may, as some predict, be well within sight of a telegraph system which will need but the simplest form of human labours to deal with both transmission and reception, but certainly one highly skilled engineer or technician in charge of each installation. This at least one estimates from one's own observations when viewing a working set in Germany.

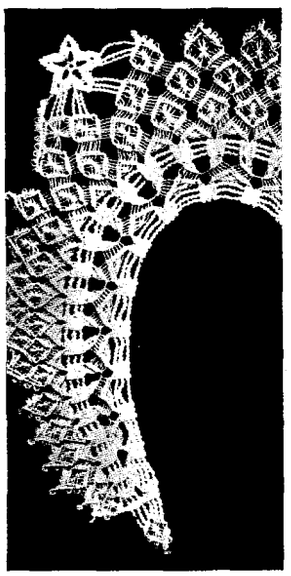


FIG. II.

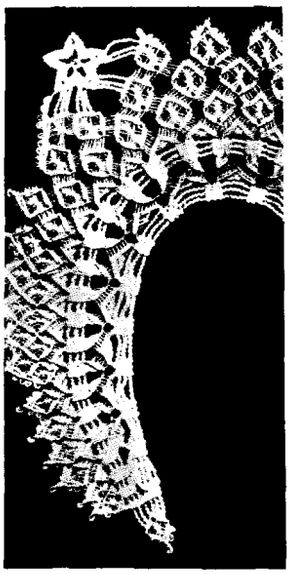


FIG. III.

This system has met every objection, one after another, until to-day there is "no previous treatment of the message or picture to be transmitted. All this is avoided, even a film or an emboss is unnecessary. A photograph, an autotype, a newspaper, handwriting, printing, or typeprinting can be placed direct on the transmitting drum of the sending apparatus," and telegraphed forthwith.

Figs. II. and III. are reproductions of an original lace design and the received copy respectively; the latter after transmission over an actual telegraph circuit.

J. J. T.

RETIREMENT OF MR. H. MARSHALL.

AT a gathering of the Staff of the District Manager's Office, Scotland West, Glasgow, C.1, on May 8, a presentation of a pair of field glasses and cut glass vases was made to Mr H. Marshall, Chief Clerk, on his retirement from the Service.

Mr. Murray, District Manager, made the presentation, and spoke in very eulogistic terms of Mr. Marshall's worth as a Chief Clerk and one of Nature's true gentlemen. His career was a long and honourable one, having joined the National Telephone Company at Bradford as clerk in 1889, was transferred to Leeds in 1890, was promoted to Chief Clerk, Hanley, in 1893, and went to Coventry in 1896 and to Leicester in 1900. On the amalgamation of Leicester with Nottingham he was appointed to the Scotland Western District in 1925. As Mr. Marshall possesses a youthful appearance and his outlook on life in general is optimistic, he ought to take on a new lease of life, especially in view of the fact that he has selected Southport for his future home town. The District Manager also expressed keen regret that the time for his departure had arrived, as he felt the loss of a valuable friend and an able officer.

Heads of Departments also supported the District Manager, and on every hand the expressions of good feeling were very sincere.

Mr. Marshall thanked everybody for the kindnesses and good-will shown him, and said he would always cherish remembrances of Scotland.

THE OUTLOOK.

PROBABLY there is no duty more fascinating in its elemental stages than that of preparing a picture of the future. To collect the material requisite for such a picture as affecting any one Town or District is somewhat laborious, and when it is done with one specific object the ultimate effect is apt to be lost sight of in the mass of detail.

We have tried to assure ourselves and all concerned that our estimates of telephone growths in the next 20 years are sound, but we have a distinct feeling of ignorance when we try to create the tones of colour that our picture should represent at the end of that time.

What will life be like when there are perhaps four or five telephones for every one that now exists? We are quite satisfied that there will be room for them but we must visualise to what extent they will be used. To this end every phase of activity must be examined to ascertain if possible what progress is probable in the same period. Of course, this review should come first, that is, before we estimate the telephone growth; and so it does but we have to present a convincing picture to those who are spending the money on the basis of the estimates.

What do we think is likely to happen that will make life different in 20 years time? We can but make comparison with the state of affairs 20 years ago or omitting the anti-progress period of destruction go back to say 1903—4. To some of us, it does not seem far back and we may be inclined to reflect that the same motives incite the human race and the changes are of little account. To those who are in their early years of understanding the antiquated forms of travel then in existence and the absence of world wide radio and film pictures must present a slow moving if not dreary universe with a population scarcely awake.

Even since the war we have seen the country intersected with great arterial roads rendered necessary by increasing motor traffic. Additional tubes have been constructed and are under consideration. Electrification of local railways is an acknowledged necessity and one great suburban system has only recently been completed. Escalators must be provided to reduce the physical exertion of climbing stairs. Air travel has established itself with unlimited possibilities. Vast portions of earth have been covered by additional dwellings. Distances have been reduced in relation to time. We are even threatened with the possibility of radio vision. The industrial side of life is promised untold facilities in the form of electric power, and land sites hitherto beyond reasonable access are soaring in value beyond the wildest visions of bygone economists. With all these present signs of progress during a period of unparalleled taxation it is truly more than one picture can depict, and the lay mind questions the successful attainment of so many projects in the time at our disposal.

The population is being more and more scattered to the outskirts of our towns and the strain of physical endurance must be counter balanced. None of the innovations referred to offers so great a compensation as the telephone and in our view this service alone will enable the coming generation to adapt itself to the changed conditions.

It must not be thought that development studies are mere guesses worked out by the imposition of these daubs of colour on the canvass of life as it exists to-day. Unless, however, we have the faculty of imagination it is impossible to draw any sensible picture of the future from the grim material presented by mere statistics.

The officers engaged on a study are encouraged to bear in mind the actual existence of those facilities and extended developments which enquiries indicate as reasonably probable. If the mental capacity lends itself to the appreciation of the increasing potentialities for telephone development it is not surprising that a comparison of the estimates with present day progress is suggestive of a field ready for harvesting.

It is generally agreed that more could be done in certain districts to popularise the service, but it has to be admitted that many important factors stand in the way of our prophesies being fulfilled which cannot be overcome at will by any one individual or agency. When the trade conditions of the country improve almost every industry will benefit. Existing empty premises will be occupied; life will become more strenuous; recreation more imperative; facilities for communication more urgent, and the provision of telephone service at every point should then be available. Such are the anticipations and there are substantial grounds for the optimism displayed.

Particularly in London the economic rise in site and land values has led to the reconstruction of numberless buildings in readiness apparently for an influx of business far in excess of anything yet realised. It is inconceivable that so great an expenditure can be undertaken by various individuals and corporations without a sanguine belief in the power of the country to produce a remunerative return.

There is justification for the spending of public money on a national service in proportion to the needs of the community as expressed in the provision for its accommodation. It is to the end of spending this money wisely that a careful survey of all properties is periodically undertaken and an endeavour made to ascertain the relation between them and the growing demand for the telephone service.

At the same time recognition has to be given to the fact that the density of telephones to population places this country only tenth in the list, and it is clear that the advantages of the service have not been realised as we believe they will be. One reads of the millions of journeys made each day by public conveyances and when it is appreciated that many of these journeys are undertaken for the purpose of a talk at the end it is evident that the telephone does not play the important part in our existence that it can be made to.

Our forefathers probably lived with as much stress as we do but in a different way. Life is doubtless quicker now. We certainly get more out of it. The world used to be regarded as at our feet to conquer by travel. It is now at our eyes and ears for interchange of thought and mutual understanding. We cannot avoid the changes. We must adapt ourselves to the new conditions and make use of the facilities available to minimise the friction which progress creates.

There are signs that the telephone is being valued more highly in so much as the increase in numbers is now about three times what it was before the War and we look forward to the growth being three times greater still before another twenty years have elapsed. This does not mean necessarily that we hope to have nine telephones where only one existed before the War but that there will be nine points of communication for each one which existed previously, that is, the facility will be brought within reach of every person in need of it. This is no idle phantasy as it has been accomplished in another part of the world in much less time and with continual pressure and propaganda it should be possible here. Our people as a whole are conservative in their outlook, and this has kept telephone development back in the past, but a change is taking place which will without doubt be reflected in telephone growth for which provision must be made if chaos and criticism is to be avoided.

G. E. N.

FOR OUR ADVERTISERS.

Contracts Open.—Melbourne, June 18—Supply of switchboard cable. Contract C. 427, Ref. B.X. 228. New Zealand Posts and Telegraphs, June 18—Supply of telephone cords (No. P. & T. 151/1425), Ref. B.X. 5251. P.M.G., Melbourne, June 25—Supply protected type telephone cable terminal boxes (Schedule C. 430), Ref. B.X. 5231. S. African Posts and Telegraphs, June 27—Automatic wall and table pattern 'phones (Tender No. 158), Ref. B.X. 5273. Applications to Department Overseas Trade, quoting references.

THE AMERICAN TELEGRAPH SYSTEMS.

By G. T. ARCHIBALD.

(*Continued from p.* 160.)

Testing and Regulating.—In both systems very efficient maintenance is a feature of the organisation. In the Western Union system balancing apparatus and relays for duplex sounder sets are located in the test room, from which all local circuits are led to the instrument room. This arrangement permits the use of a narrow instrument table and at the same time provides more space for the operator, and ensures efficient and economical maintenance as all circuit and relay adjustments are attended to by trained repeater attendants. Operators gain the attention of the repeater attendant by depressing a signal button in the sending lead of the set which operates a lamp at the relay position.

All testing and regulating is performed by the Wire Chiefs, Assistant Wire Chiefs (test board), Repeater Chiefs and Assistant Repeater Chiefs (repeaters, Morse balancing apparatus, &c.), Automatic and Printer Chiefs and Assistant Automatic and Printer Chiefs (multiplex and teleprinter).

All internal maintenance is proper to the traffic staff and not to the engineering or plant department. Mechanics are not allowed to enter the instrument rooms.

Automatic Chiefs and Printer Chiefs and their assistants are required to pay close attention to the apparatus under their control, to remedy faults which will yield to immediate treatment without removing the apparatus, and to nurse routes which may be interrupted by intermittent line faults.

Apparatus which cannot readily be repaired is at once removed to the workshop for attention by equipment maintainers, or mechanics, who are also controlled by the traffic staff. Any piece of apparatus which cannot be repaired locally is sent to a central apparatus shop and a new unit is requisitioned.

All apparatus is withdrawn at fixed intervals for inspection and overhaul. Phonic wheels are examined at intervals of six months, driving forks and distributor plates every two months and so on. Each channel unit is completely overhauled every two months.

Every fault is recorded and a complete life history of all apparatus is available.

Morse speakers are provided between the instrument room and test room in the proportion of one to every seven multiplex circuits in order that the attention of the Wire Chief may be gained without delay in the event of a line fault.

Assistant Automatic Chiefs are provided with benches and tools to enable them to effect minor repairs on the spot, there is liberal provision of spare apparatus, with the result that faulty apparatus on working circuits is a rarity.

Stability.—It would be useless to close one's eyes to the fact that apparatus stability leaves much to be desired in this country. How then does the American service compare with our own? We have all heard rumours of cast-iron stability, rumours which did not quite fit in with British ideas of machinery of American manufacture. We are always told that Americans build on Monday, install on Tuesday, and scrap on Wednesday, and that they simply cannot afford to put the best workmanship into their machines. I have come to the conclusion that such statements must be taken with a large pinch of salt.

The first man I tackled on the question of stability looked rather puzzled when asked how much time was lost weekly through apparatus faults. "None," he said. "We don't allow circuit stoppages unless the lines are not available. We don't normally lose more than five minutes a week on any circuit." All the evidence I could find during my stay in America tended to confirm that statement. It is, of course, obvious that the very high output figures regularly obtained, and about which I shall have a few words to say in a moment, would be impossible without almost cast-iron stability.

Competition may have some bearing on the matter, but the fact is that a very high standard of maintenance is essential if satisfactory operating is to be made possible, and I may say that one did not need to visit America to learn that lesson. It is what we have been seeking for the past four or five years. We have been hampered by want of suitable reserve apparatus, by the use of too many different types of apparatus, by the frequent changes in personnel which have lowered the general standard of efficiency, and by the absence of specialisation. I am glad to be able to say that steps are being taken in this country to allot spare apparatus more liberally, and to reduce the number of types of apparatus, whilst the question of stability is receiving consideration.

All Western Union multiplex circuits are worked continuously night and day except for a period of about twenty minutes in the early hours of the morning when relays are cleaned and set and brushes, &c., are attended to.

Branch offices with only one teleprinter circuit are provided with a reserve machine. This machine is tested each Monday but is not used unless the circuit machine is out of order.

Should a breakage occur or other serious trouble develop a mechanic is sent from the head office. Mechanics visit every small office once monthly to examine the apparatus, but the question of reducing the number of inspections from 12 to 6 per annum is now under consideration.

Operator Output.—In this country the staff and the administration have never been able to agree as to what constitutes a reasonable operator output. This unfortunate state of affairs started with the adoption of the old 24 average, when all our circuits were operated by Morse, and it has continued with the introduction of staffing standards following the development of machine telegraphs after the war.

Our American friends have been able to avoid the pitfalls of an average system by the simple expedient of placing the best qualified operators at the most heavily loaded routes, and by fixing the operator's pay according to the class of circuit he or she may be required to operate. The only change of occupation available for any operator is the change from sending to receiving, and *vice versa*.

With specialised operating and efficient apparatus and maintenance you have almost ideal working conditions. When, added to this, operators are carefully trained to observe the operating rules it would be surprising if excellent output figures were not a regular feature of the business.

I don't want to weary you with figures, and one typical case will suffice. At the Western Union Main Office in New York the average hourly output on multiplex circuits (for 24-hour day) during September last (including Sundays) was 49.9 unequated telegrams. The busy hour figures were, of course, considerably higher and as a matter of fact outputs of 80, 90 and 100 and upwards are registered during consecutive hours at the most heavily-loaded circuits.

There you see the benefit of specialisation and efficient apparatus, and I feel absolutely certain that given similar conditions we could obtain in this country equally good if not better results in the busy hours. We could not expect the same high averages throughout the day because we have no deferred traffic to fill up line time.

Monitorial Duties.—The work of each operator is checked from time to time in order to test the quality of his work, and the results of these observations are taken into account in determining operating positions and salaries.

The work of Morse operators is observed by an operator who listens in in parallel with an "Ediphone" connexion. The monitorial operator notes all operating irregularities and this record together with the ediphone record is then transferred to another position where the latter is checked for errors and speed.

The work of automatic operators is checked by re-running the operators' perforated slip in short circuit, that of teleprinter operators is checked from the home record and that of phonogram operators by listening-in.

All errors are brought to the notice of the Assistant Chief Operator in charge who deals with the operator concerned.

The original forms required for the purpose of the check are obtained on requisition from the finished check or filing section.

The records obtained from these observations indicate a very high standard of operating. At some offices the results of the best operators are displayed on a blackboard; a large number of cases were brought to my notice where operators had perforated from 60 to 80 telegrams with a single mistouch error, or irregular operating signal.

Quality of Service.—The quality of service has been much improved in recent years, and efforts are now made to dispose of all fully-paid traffic within 5 minutes. Deferred traffic is usually handled in from 15 to 20 minutes; the maximum delay allowed on such traffic is one hour.

Fully-paid "X" telegrams, i.e., telegrams relating to the buying and selling of stocks and shares, cotton, wheat, &c., dealt with at Stock and other Commercial Exchanges, are handled on a no-delay basis, special arrangements being made for the rapid circulation of this traffic from point to point by hand.

Similarly, "RX" telegrams, i.e., telegrams dealing with the sale and purchase of fruit, vegetables and all other perishable goods, banking business, death and sickness are given as nearly a no-delay service as conditions permit.

Government messages have precedence over all other traffic.

At the larger offices where collection is made by belt conveyors, the office drag averages about 2 minutes, notwithstanding the fact that much of the work circulates from one floor to another.

From time to time a spot check is made of the traffic in order to test the speed of service. In some cases the information is obtained from the forms examined at the monitorial positions, and in others from a bundle of traffic selected indiscriminately. The speed of service is now so good that a monthly check is deemed to be sufficient.

In order to reduce delay to a minimum an arrangement is in operation whereby all offices within a given zone report hourly the number of telegrams on hand and the delay to a "Despatcher" at certain of the larger offices. This officer, who is responsible to the Vice-President, Traffic, and not to the officer in charge at the office in which he is located, controls all lines and the movement of traffic at all points within his zone. If delay arises on one route he may order the diversion of traffic or the opening of another circuit between the offices concerned. Special speaker wires are provided in order that prompt action may be taken.

Press Traffic.—American newspapers receive large quantities of Press work mainly over private wires leased from the American Telephone and Telegraph Company and the two telegraph companies. The Western Union

Company provides excellent facilities for special events such as important political speeches, base-ball and football matches and race meetings. Special circuits are provided between sports grounds and the newspaper offices, these lines are provided free of charge, the company charging only the usual Press tariff. The apparatus is generally fitted at the front of the Press box. A reporter sits alongside his particular circuit, either writes or types his matter, and in some cases dictates it to the operator, who, of course, uses a semi-automatic key and the Phillips code.

During the presidential campaign the companies' representatives travel with the candidates' retinue in order to ascertain the amount of work to be handed in day by day and each office is advised, in advance, of the probable number of words.

Delivery.—Delivery is a serious problem for both companies. Boys are difficult to obtain in the larger towns and do not as a rule remain in the service for more than a few months. The Western Union Company attract boys by stating that messenger employment brings them into contact with other employers and therefore widens the possibility of obtaining suitable permanent employment.

In the Western Union Service boys are required to pay about 40 cents a week for the hire of uniform, except at New York and Chicago. Boots and cycles are supplied to them at cost price, on hire purchase terms. Each boy changes into uniform before taking up duty and into mufti at the end of the day. A clean uniform is provided fortnightly, and all recovered clothing is stored, cleaned and pressed before re-issue. Shower baths and dressing cubicles are provided for the boys. Motor-cars and motor-cycles are used for delivery to outlying places, the special messengers employed providing their own machines.

At one time a flat-rate weekly wage was paid for all delivery work but recently both companies adopted a journey rate for delivery and collection at offices where two or more boys are employed. There are two systems (1) the per message system and (2) the route system. In the former case, which applies only at offices in skyscrapers and where three or more messengers are employed, there is a flat-rate payment. In the latter case the payment depends upon the time occupied per journey. This is a kind of walk delivery system.

Messengers are assigned to particular routes in order that they become thoroughly acquainted with the topography of the neighbourhood. Specialisation again.

Telegrams are batched and sent out within five minutes of receipt at the delivery system. There are more delivery offices within a given area in a large city in America than in England and although the average distance covered per journey by a messenger is lower in the former case the number of telegrams delivered per journey is greater.

At railway station offices the means and time of delivery depend upon local conditions.

Phonogram Rooms and Equipment.—Considering the heavy traffic dealt with it is surprising to find how small a part telephone working plays in the American telegraph organism so far as the public is concerned.

In New York only about 300,000 of the 9,500,000 telegrams handled monthly are disposed of by telephone to and from subscribers and 600,000 branch office and private wire telegrams are similarly dealt with. This is probably due to the facilities which I described earlier on whereby a telegraph user is enabled to signal for a messenger to collect his traffic. Public traffic over telephone circuits is, however, increasing, but on the other hand branch office circuits are gradually being converted to teleprinter working.

The phonogram equipment calls for no special mention.

Phonogram rooms at the largest cities are divided into three sections: (i) subscribers' telegrams, (ii) branch office telegrams and (iii) private wire telegrams. These rooms seemed to me to be much noisier than those in the large towns in Great Britain. In most cases attempts have been made to damp down the noise by the treatment of ceilings. I am very much afraid that similar conditions would be unacceptable to operators in this country. All reception is by typewriter, and foot switches are used for cutting out operators' transmitters.

The standard speed of answer of the Western Union Company is 6 seconds but the average at New York, Chicago, Philadelphia and Washington is said to be not more than 3 seconds; 18 seconds is regarded as the maximum delay allowable. An operator is employed at a key or controlling panel at the New York Office for the purpose of seeing that calls are taken up as nearly as possible in sequence; if a particular call appears to have been neglected she operates a flashing signal by pressing a button associated with the calling lamp in order to direct attention to the call.

About one-tenth of the total traffic is dealt with in the peak hour 10 to 11 a.m. Operator output at the four cities visited averages over the 24 hours from 12 to 13 in the case of telephone subscribers' traffic, 17 to 18 in the case of private wire traffic, and 26 to 27 in the case of branch office traffic.

A subscriber on an exchange outside the city limit may dictate a telegram to a city office if he is prepared to pay the cost of the telephone connexion. In New York and Chicago business telegrams are not delivered by telephone in the business area unless there are exceptional circumstances. Outside that area attempts are made to deliver all telegrams by telephone except those dealing with illness or death.

At the largest offices operators do not count the number of words or time the telegrams. Band conveyors take the telegrams to a central point where the messages are checked, the number of chargeable words inserted, and the time and date printed by means of a Stromberg timing stamp. A record is kept of the number of telegrams each half-hour during the day.

Every operator keeps a record of the number of transactions dealt with throughout her period of duty.

No accounting work is performed in the phonogram room. At the close of each day the forms are sent to the book-keeping branch where charges are computed and accounts prepared. Accounts for telephone subscribers are normally rendered to the telephone company, not to the subscriber, but in some cases, and by special request, accounts are rendered direct to subscribers. A list of subscribers who are shy in the matter of payment of accounts is kept at each recording position and an operator is expected to consult the list before releasing a telegram.

The Postal Telegraph-Cable Company furnish a confirmatory copy of every telegram other than those of a social character, but the Western Union Company's practice is to supply copies only at the request of the addressee. A few requests are made for the delivery of confirmatory copies by messenger and these are complied with. A copy of a telegram sent out as confirmatory is made, on a duplicator, and retained in case of enquiry.

There is a story about a Democratic candidate at a recent presidential election, probably put into circulation by wicked Republicans. The candidate was dictating a telegram, the text of which read something like this "Send gun at once." The operator could not get "gun" and finally asked the sender to spell it. "G U N," he said. "G for Jesus, U for Europe, N for pneumonia."

Dining Rooms and Welfare Work.—The Western Union Company provide restaurants on the cafeteria principle at all offices where the preparation of food on the premises can be justified. The company's officials manage these restaurants and serve meals at a price just sufficient to show a margin of 1%. Automatic weighing machines, and others for the sale of pea nuts, chewing gum, &c., are a feature of all dining rooms. The prices charged in these well-managed concerns are much lower than those in force outside. The manageress of a restaurant is usually responsible for the entire staff employed and for the purchase of foodstuff and plant.

The Western Union Company employ a trained Welfare Matron at an office where 25 or more women are employed. She is responsible for the supervision of rest rooms, lockers, lavatories, &c., to see that blankets and other similar articles are available for emergencies, to maintain decorum outside the operating rooms and to advise young women on hygiene, &c. The matron at New York is helped by four assistant matrons.

An interesting feature of this work is that the matron holds a supply of ladies' hose for the use of women who desired a change on reaching the office on wet mornings. Their own hose is washed and dried ready for wear on leaving duty. This simple precaution is said to reduce sick leave due to colds, chills, &c.

Nurses are also employed at the larger offices. At New York there is a head nurse and three assistants. Two of the latter visit the homes of sick members of the staff. In every case when an officer advises absence on account of illness a nurse is at once sent to see whether she can render any assistance.

At about 20 offices a qualified medical man employed by the company attends twice weekly to examine members of the staff returning from sick leave. At other offices the staff are required to visit a doctor employed by the company before resuming after a serious illness.

Publicity and Advertisement.—Both companies make considerable use of attractive window display bills, "folders" and "stickers." In addition, canvassers maintain close touch with good customers and endeavour to attract new ones.

Newspaper advertisement is not considered to be worth while, but considerable use is made of "puff" paragraphs and pictures.

Leased Lines.—Both telegraph companies provide private wires or leased circuits, but the great bulk of this business is in the hands of the land lines department of the American Telephone and Telegraph Company. I believe about 2,000 such circuits are rented from this company. Leased circuits are obtained largely by the compositing and by the use of carrier waves above the voice range superposed on telephone circuits. Voice-frequency channels are also in use. The rental for leased circuits of all kinds is based on the shortest railroad distance between the towns concerned. The day (6 a.m. to 6 p.m.) and night (6 p.m. to 6 a.m.) rates are $24 and $12 per mile per year respectively. For 24 hours' service the charge is $36 per mile per year. Additional drop channels are charged for and use may be extended in the case of limited service at *pro rata* rates.

Demands for private wire circuits are dealt with in an amazingly short time, and the American Telephone and Telegraph Company maintains telegraph circuits between New York and its principal offices in order to facilitate correspondence. All urgent arrangements are made by telegraph and a private wire circuit can usually be provided in working order in a day or two.

Private wires are provided on the understanding that they shall be used only for the business of the renters who agree to refrain from accepting traffic from other persons and to act as telegraph companies. There is reason to believe that many renters contravene this agreement by dealing with other traffic to fill up line time, and American Telephone and Telegraph Company and the telegraph companies seem powerless to prevent the abuse.

Conclusion.—Although there are indications that telegraph traffic is reaching if it has not already reached saturation point in America, the fact remains that the traffic has increased enormously since 1914. Traffic officers with whom I discussed this expressed themselves as satisfied that the main reason for the prosperity of the business is the fine service given between the large centres of population and industry.

I don't know whether we in this country, with our excellent postal system, have anything to learn from that. The American postal system is pretty bad and it has to be borne in mind that it takes 22 hours on the fastest train to travel from New York to Chicago and three days from New York to San Francisco. A fine telegraph service has therefore every chance of success.

American telegraph officials are not in any case prepared to see the traffic fall away without any attempt to stop the rot. One important official considers that the social use of telegrams has probably reached full development in the United States. It is significant, however, that he considers that the business use of the telegraph system is at a stage when the surface has hardly been scratched. He argues, and rightly I think, that so far the business telegram has been developed on a condensation of words which he regards as an intellectual barrier to the free use of the telegraph, and his aim is to cheapen the service to a degree which will induce people to send letters by telegraph instead of brief messages. That is why compositing, voice frequency and carrier wave systems and the telephoto process are about to be developed in America.

Another prominent official is anxious to develop the teleprinter exchange; his company is about to erect call boxes at strategic points in large cities for the use of the public who want to send telegrams.

Both believe that there are large numbers of people who want to use the telegraph and don't know it, and that lots of people use the post and the telephone who ought to use the telegraph.

There are no pessimists in the telegraph business in America; they don't wait for the traffic to come to them, they go out and seek it; they keep the business in the public eye and they are constantly on the look out for new uses to which the system can be put. The Western Union Company proposes to install 4,800 additional teleprinters on public circuits during the current year.

In this country the telegraph system has been a political shuttlecock ever since 1868. The Post Office is not allowed to fix its own tariffs and is subject to Treasury control. It is bound by statute to deal with all telegrams in the order in which they are handed in and has to attempt to give the same quality of service between London and any remote village dealing with one or two telegrams a day as is given between London and Manchester and other important business centres. It has to waste effort in that direction instead of concentrating its energies upon the task of encouraging business people to make more and more use of the service. In America the telegraph system is free from political influence, the companies are permitted to levy charges sufficient to ensure a reasonable profit, and each community gets a service corresponding more or less closely to the value of the business it gives to the companies.

Apart from the possibility of developing the "Greetings" telegram I don't think we can hope to increase our social traffic, but I do believe that we could attract more business traffic if we could be relieved of the statutory obligation to treat all telegrams with approximately equal celerity.

In a country like Great Britain where there is not the same need for telegraph service as in America, we cannot hope perhaps to quadruple our traffic. Nothing is more certain, however, than that we can encourage the public to make greater use of the service. In order to do this there must be whole-hearted co-operation between the administration and the staff, both sides looking all the factors squarely in the face. I believe the time is ripe for a greater measure of co-operation than has so far been possible, and if ultimately it proves that the American Commission has done something to make that possible it will not have laboured in vain.

PRIMROSE EXCHANGE.

THIS Exchange (at Kilburn, London, N.W.) originally an old church, has an interesting history.

It now accommodates a staff of sixty to seventy people, and is fitted up with all the equipment for an up-to-date manual exchange.

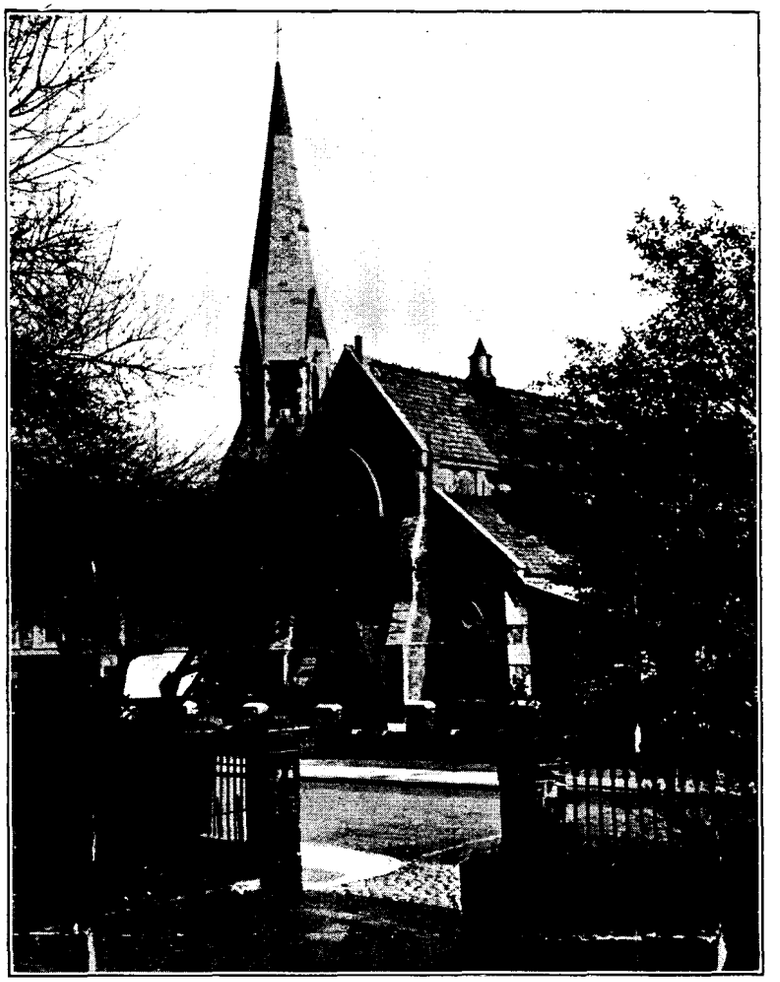
Its history begins in 1855, when a few gentlemen, members of different churches "took very eligible premises" in the neighbourhood capable of holding 200—300 people.

In 1858, the present site was secured for a new chapel (presumably the premises had proved inadequate) and the foundation stone was laid by the Lord Mayor on the 13th of October, 1858.

In 1859, the new chapel was opened, having seating accommodation for 800 people. The cost including the site was £3,070.

The first ordained woman minister was the Rev. Constance Coltman, Joint Pastor with her husband, in this church. She married couples with marriage service (in which the word "obey" was omitted) compiled by herself. The congregation was a flourishing one during her years of service, but later dwindled, and in after years this fine edifice was taken over by the L.T.S. as an Exchange for the District.

While negotiations were going on, Peter the Caretaker, truly the keeper of the keys, usually had to be dug out of a local resort, before anyone could gain access. His reminiscences are now somewhat vague as to names and dates, but he explained that "he had kept the place clean and tidy for eleven year, and the parsons were good men. Oh, yes; they often give him a shillin' and let no one see."



PRIMROSE EXCHANGE.

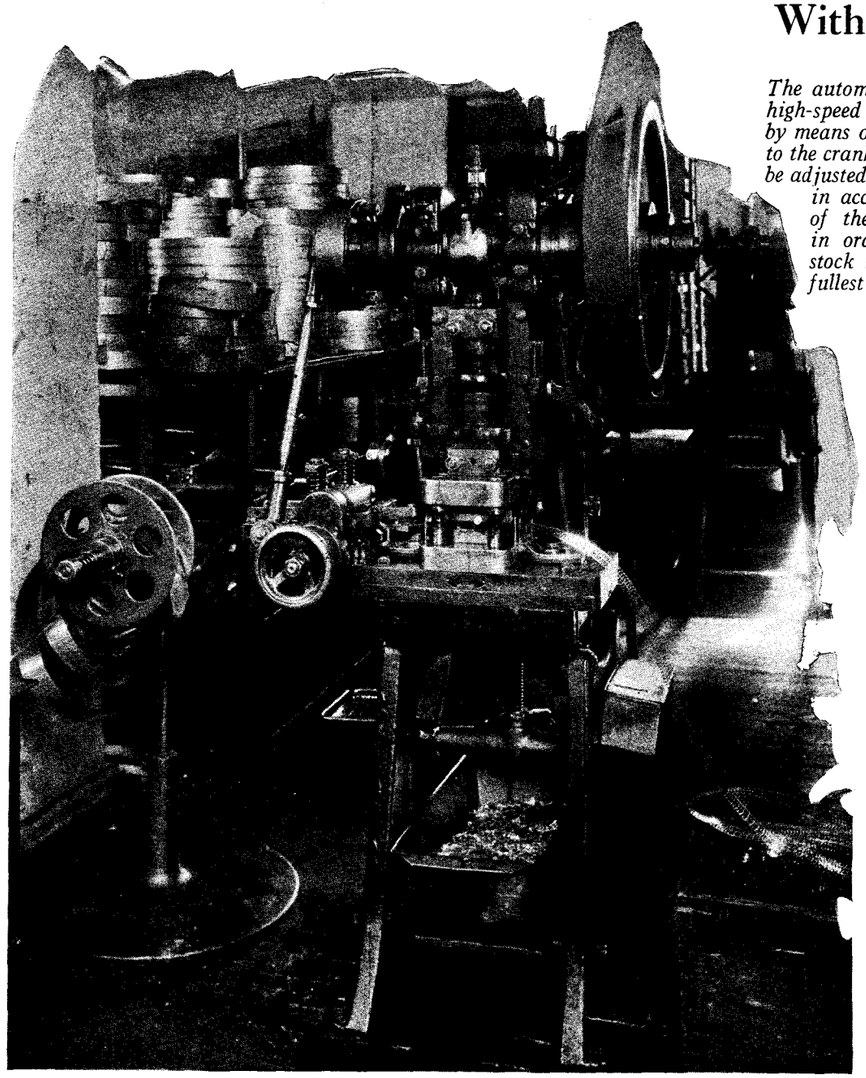
In the early days there was a persistent rumour that the church was haunted. Birds flew in and built their nests in the splendid hand carved rafters, doors opened quietly and then closed quietly, no one to be seen. It is said that at 7 o'clock every night the air grew cold and still and a nocturnal visitor walked down the Robing room stairs and into the Exchange. Once, in the middle of the night, a sudden and loud rapping made the solitary night telephonist leap to his feet. When his trembling body reached the door, there stood a truculent policeman, who fiercely demanded "what he was doing there, at this time of night."

Until quite recently tickets for soup and bread, and requests to see the Minister have been made by down and outs. Two elderly ladies called to say how pleased they were to see the place of worship had been opened again. They were not convinced of the change until they had a "peep in" and went away loudly protesting against such wickedness.

The odour of sanctity still clings, and we who believe in the ghosts of the past, like to think that their prayers and good intentions breathe their fragrance in our time.

Maintaining Strowger Automatic Supremacy—

With Automatic High-Speed Machinery



The automatic push feed on this high-speed punch press is operated by means of an eccentric attached to the crank shaft. This feed can be adjusted and the stroke changed in accordance with the size of the part being punched, in order that every bit of stock may be utilized to the fullest extent.

THE high-speed punch press shown in the illustration is not only one of the fastest of its kind, but is also entirely automatic in operation, except for the placing of new rolls of sheet brass in the feeding device. This particular machine punches out terminals used in banks, condensers, terminal blocks and cords at the rate of approximately 60,000 per hour, increasing the production of this article to almost seven times the former rate.

This is a typical example of the application of modern methods of high-speed production to the manufacturing processes throughout the factories of Automatic Electric Inc. It is significant in that it indicates a policy which, in the face of rising labour costs, is desirous of keeping Strowger Automatic telephone equipment available at reasonable cost, while still maintaining the high standard of quality in both material and construction that has been synonymous with the name Strowger for over thirty-five years.

[*This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.*]

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The
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Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

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WILLIAM ALEXANDER VALENTINE.

WITH Mr. Valentine's retirement the telephone service loses a conspicuous personality belonging to the now much diminished band of those who were in the telephone business almost from the outset and had, therefore, the opportunity and privilege which comes to pioneers alone of a personal share in shaping the main features of a service at the time when it is most plastic. Those whose energies and aspirations are necessarily limited to carrying on the torch, to extending the scope and improving the quality of a well-established system may perhaps be pardoned if, overlooking the failures and disappointments which invariably accompany first steps, they sometimes feel that pioneers have the more romantic and soul-satisfying task.

After earlier duties performed in the field and office, Mr. Valentine was made District Manager for Northern Scotland while still not 20 years old. He later held more than one responsible post in Manchester, and in 1898 was placed in charge of the Glasgow district, where strenuous competition between the Company and the Corporation long continued. Shortly after the transfer of the telephones to the Post Office, he left Glasgow to fill one of the Provincial Superintendentships at Headquarters. In 1916 he was appointed Deputy Controller of the London Telephone Service and, early in 1923, was made Controller on Mr Preston's retirement. His varied Provincial service and his duties at Headquarters equipped him with intimate and detailed knowledge of innumerable aspects of telephony and developed the sanity, balance, moderation and good sense which characterise him.

During his Deputy Controllership he had to handle difficult problems created by the war, and, when hostilities ceased, the conditions were, possibly, still more trying. The trade boom resulted in an enormous demand for telephone facilities, and the Post Office, having practised most conscientiously the policy of economy during the war, had not sufficient reserve plant to meet all demands, and its manufacturers, having plenty of orders from all quarters, could quote only long delivery dates. So completely have difficulties of this type been conquered that during the past two years Mr. Valentine has not had to refuse a single order. The number of subscribers in the London area is now over two and a half times as great as when he joined the London Telephone Service, and during his Controllership more than a quarter of a million telephones have been added. During the same time London's vast Toll service has been established and the Trunk service improved out of all recognition as regards transmission quality and reduction of delay, while its range has been extended to practically all Europe outside Russia and the Balkans, and, by means of the transatlantic service, to almost the whole of North America, so that subscribers in Great Britain can now speak to approximately 90% of the telephone subscribers of the globe. Mention must also be made of the successful start with the stupendous task of converting London to automatic working. This brief summary of the immense strides made during Mr. Valentine's tenure of office in the L.T.S. may seem somewhat superfluous to those in constant touch with telephone developments, but no adequate tribute can be paid to any captain of industry without concrete reference to the changes in complexity and scale of operations in the department under his charge, and in acknowledging Mr. Valentine's personal share in these great developments, we do not for one moment overlook the fact that many others, both inside and outside the London Telephone Service, have also had a big part in them.

Mr. Valentine's personal qualities include courtesy of a most attractive type, blade-straightness, high-mindedness, insight, sympathy, general kindliness and a desire to help others. He has always manifested marked fairness and extreme consideration for the ways and views of others, whether members of his staff or of the general public. His patience and serenity when confronted by uninformed or even unjust criticism have been the more remarkable because he has keen sensibilities. Possessed of a lofty sense of duty to the public, he has ever endeavoured not only to ensure service of a high grade to all subscribers but also, so far as was humanly possible, to remove every occasion for misunderstanding or suspicion. He has had notable opportunities to demonstrate this side of his character in connexion with the revision of rates in 1921 and the introduction of automatic working more recently.

Notwithstanding depreciation of the Civil Servant sometimes found in the Press, the Public in its more generous and, may we hope, more just moods, regards the typical public servant as equipped with wide knowledge of his work, self-restrained and imperturbable in the face of unfair criticism, impartial, devoted to duty treated strictly as a trust, subordinating self to the public need and free from ignoble concern for personal advantage. Mr. Valentine has come very near to the ideal in all these respects.

His courtesy, good-will, sympathy and consideration have made him popular with his staff and established him in their regard and respect, and he, on his part, has left no stone unturned to further every claim which he could conscientiously put forward in their interest. He has ever endeavoured to find the good in his fellow creatures before commencing to look for anything else. Indeed, his kindness of heart might occasionally have been criticised by a sterner disciplinarian if the method followed were not justified in the result. He has keenly interested himself in welfare work and in staff social activities, often at great sacrifice of his own leisure. How successful he has been in commanding regard may perhaps be illustrated by the avowal of a candidate before a Selection Board that, having served under Mr. Valentine in his earlier days, he had ever since endeavoured to follow his example as the ideal. It is surely given to few Civil Servants to be hero-worshipped.

Mr. Valentine's whole outlook on life and the peculiarly high standard by which he has regulated and maintained his relations with humanity, have been based neither on social convention nor on philosophical expediency, but on a strong sense of the fundamental importance of things moral and the possession of deep spiritual convictions.

Mr. Valentine has rendered considerable service on Committees and Societies, and special mention should perhaps be made of the fact that he has served on the Editing and Organising Committee of this journal for ten years and has acted as Chairman for the past two years.

Mr. Valentine has had the wisdom and strength of mind to retire while he is still physically and mentally vigorous and can anticipate many years of health and happiness in the less exacting activities and interests open to one no longer in the daily grip of the onerous official responsibilities, and all who know him will join in wishing that he may long live to enjoy the occupations to which he may devote himself.

F. H. S. G.

TELEGRAPH TOPICS.

"TELEGRAPHIC Memorabilia" have been a monthly feature of this Journal ever since the Journal began, and we are fortunate in the fact that Mr. Tyrrell, who wrote them in 1914, still writes them to-day. Since that time the scope of telegraph science has expanded incredibly: wireless, then in its infancy, has established its place not only as a reliable means of telegraphic communication but in the homes of hundreds of thousands of people who have never heard of Hughes or Baudot. Simultaneously, the landlines and cables have made great strides: phantom circuits are superposed on physical circuits and the oceans are spanned by loaded cables. No less has been the development in methods of transmission: facsimile-transmission and television are already accomplished facts.

Naturally and properly, as knowledge grew, "Telegraphic Memorabilia," trying to keep pace with it, grew longer and longer: and for several years past pressure of space has compelled us most reluctantly to relegate it to small type. We hope in future to print it in ordinary type, and thus to restore to it the prominence that it deserves. At the same time the "Memorabilia" themselves will be condensed into a few short paragraphs of current interest to telegraph men and women, giving up all attempt to be comprehensive. In future, the products of our contributor's painstaking research will be expressed not only (nor even mainly) in the "Memorabilia," but in articles which we hope to receive from him monthly that will summarize recent scientific developments on telegraph subjects.

We make the change with some reluctance. We know that we are losing much; we hope that we are gaining more. The change is only provisional. Our aim and that of our contributors is to keep our readers informed of the progress of telegraphy throughout the world; and whether the change serves this purpose better or worse, only our readers can judge. We should be very grateful to receive their views, whether for publication or not.

TO OUR LOCAL CONTRIBUTORS.

WE should like to draw the attention of our contributors, and more especially of those contributors who send us in items of staff news and local notes, to one or two points. The first is that such notes should be received by the Editor not later than the 20th of the month, and the second is that the Telephonists' column ("Talk of Many Things") is not intended, and never was intended, to be confined to the doings of London Telephonists. The Editress of that column would welcome contributions from operators and notes of interest to operators all over the country. We should also welcome, both for that column and for the illustration of other local notes, photographs of staff groups, staff sports, and staff functions, which we are always pleased to reproduce so far as our space permits.

CIVIL SERVICE ARTS MAGAZINE.

THE contents of the second issue of this publication display an excellent variety. No less than seventeen plays or comic operas are reviewed at some length. No doubt the harvest from the dramatic seed sown during the winter months by a multitude of Service Dramatic Societies is reaped in March and April, but this record is nevertheless a striking testimony of the strong bent of large numbers of civil servants towards the drama. There is a good and discriminating review of the Civil Service Arts Council Exhibition of Arts by Captain Dalman, and a further article of great interest to art-lovers, by Dr. Anne Brougham on the Modern Outlook on Art. Mr. Ronald Oakeshott furnishes Some Notes on Novels and Novelists in which he seems to enunciate that "form"—in its narrow sense—is rare amongst "classic" novelists, says: "I think the 'form' of second rate books might show a higher average of excellence." Provided that "form" is used in quite its narrowest sense, we shall not quarrel with this dictum—provided, too, that "second rate" includes all those delightful authors of definitely high quality, whose rank as "classics" is not quite assured. This again is a point that the devotees of such authors will hotly contest.

We are asked to announce that copies of the magazine (7d. post free) may be obtained from Room 208, Treasury Chambers, Whitehall, S.W.1.

HIC ET UBIQUE.

WITH the retirement of Mr. W. A. Valentine from the service the Editing Committee loses a valued colleague whose assistance it has enjoyed since 1919, and who has presided over its deliberations since Mr. Lee's retirement two years ago. We wish him the best of health to enjoy his well-earned leisure. His place on the Committee will be filled by Lieut.-Col. A. A. Jayne, D.S.O., O.B.E., M.C., who has been an occasional contributor to the *Journal* almost since its inception. Col. Jayne will be the first representative of the provincial staff to serve on the Committee, and he is a particularly welcome addition to our number.

Mr. Valentine will be succeeded as Controller of the London Telephone Service by Mr. W. H. U. Napier, to whom we offer our cordial congratulations. A portrait and biographical sketch of Mr. Napier appeared in our November (1924) issue.

An official report of the French Post Office shows that the ten largest towns in France had the following telephone development at the end of 1927: Paris, 1 station to 9 inhabitants; Marseilles, 1 to 31; Lyons, 1 to 26; Bordeaux, 1 to 18; Lille, 1 to 16; St. Etienne, 1 to 45; Nantes, 1 to 34; Nice, 1 to 18; Toulouse, 1 to 39; and Strasbourg, 1 to 14. In order of merit, the ten best-developed towns were: Biarritz, 1 to 8; Vichy, 1 to 8; Paris, 1 to 9; Cannes, 1 to 10; Dunkerque, 1 to 14; Strasbourg, 1 to 14; Lille, 1 to 16; Compiègne, 1 to 18; Nice, 1 to 18; Tourcoing, 1 to 18. These figures reveal a curious inequality in France's telephone development, for while that country has a total development of only 1 telephone to 46 inhabitants, as against Great Britain's 1 to 22.4, Paris has a slightly higher development than London, while Vichy and Biarritz are certainly ahead of any British pleasure resort.

French telephone engineers, it is announced (says a paragraph in the Press), are engaged on a survey of the Syrian telephone system with a view of adapting it to work in connexion with the system introduced into Palestine during the British occupation. This adaptation, which when complete will provide communication between Egypt and Syria via Palestine, will form an important link in the future London-Egypt line. The General Post Office has already reported successful test conversations between London and Bucharest. The completion of the Syria-Egypt line will practically leave only Turkey in Asia to be brought up-to-date to make the through connexion.

The prospect of a Europe-Asia-Africa circuit affording communication between London and Cairo might arouse the fairest hopes in the telephone enthusiast, if its achievement did not lie so far in the future. The London-Bucharest service is by no means a *fait accompli*; nor is the provision of the link between Bucharest and Constantinople a light matter; and as regards a trunk route across Asia Minor, we refer our readers to the article which appeared in our August, 1928, issue, in which this formidable task was discussed. We like to keep a prophetic eye on the future achievements of telephony, but we imagine that communication with Cairo is likely to be obtained by a wireless link before an overland (and submarine) route is built throughout.

Referring to a headline in an evening paper, "Night Telephone Delays Anger," *Punch* comments: "We doubt it." This is a good example of the entirely meaningless language used in headlines. They are often quite unintelligible until the paragraph to which they refer is read. An equally good specimen was one we noticed in an American telephone journal some years ago. It ran: "Telephone Kicks Prostrate Operator." One had visions of a fatigued operator lying prone on the floor and of a demonic telephone leaping from its shelf to kick its helpless victim. On reading the paragraph, however, one found that "kicks" (= complaints) turned out to be a noun and "prostrate" a verb.

Telephony, of Chicago, in its issue of April 27, pays a high tribute to British telephone development and to the excellence of our service. It remarks that the British rate of growth is 7.8%, as against the rate of growth in the United States of 4.4%. It is, of course, only to be expected that in a country with so dense a telephone development as the United States the rate of growth should be no higher than it is. Five office buildings alone in New York City have 19,200 telephones between them—a higher number than many a celebrated European city possesses, and the Equitable Building (New York) is said to possess more telephones than the whole of Greece. Still the Americans are not satisfied. They scout the idea of having reached saturation point yet, and clamour for an equally high development in other office blocks!

According to the *Electric Review*, a radio-telephone service between Germany and Siam was inaugurated on April 26. The service is conducted from the Nauen wireless station on a wavelength of 16.9 metres, the distance being some 5,300 miles.

W. A. VALENTINE—AN APPRECIATION.

"WHEN men are rightly occupied their amusements grow out of their work as the colour petals out of a fruitful flower." Thus Ruskin expressed picturesquely the truth stated in more prozaic terms by Hazlitt when he wrote "We must be doing something to be happy."

It is the keynote to interest in life for many business men, including the subject of these notes.

Time is remorseless in its progress. Unless one remembered it from actual experience it would be difficult to realise that when W. A. Valentine entered the telephone service earth circuit exchange lines were current practice, central battery exchanges were unknown, multiple switchboards were in their infancy and fitted at very few places, granular transmitters were a thing of the future, and paper-insulated dry-core cables were not yet invented.

Valentine was one of that now fast-dwindling band of devotees whom the National Telephone Company rallied to itself for the pioneer work in this country. Its managers were young men who were not encouraged to harass headquarters with their troubles. If there was work they were expected to do it; if there was difficulty they were expected to get over it. They did, and in return got small pay, a little credit, and no thanks. One general admonition was to spend as little money as possible, and therein we see the beginnings of that Scottish thrift long regarded as a sound principle in telephone management. They had to get their own wayleaves, fit their own instruments, clear their own faults (or at least a good many of each); they not only erected poles but bought them for erection, and when the unknown stared at them they improvised round it. They had perforce "to scorn delights and live laborious days" but had their reward in the fascination of their work, in experiences which fitted them for bigger things, and in that developed self-confidence which evolves naturally from such an apprenticeship.

It is no doubt true that environment is reflected in character but the converse is equally true in many cases. A man with the

right qualities can create his own environment, and personality can rise superior to conditions. It is probably not putting it too high to say that from the time when he took charge of the opposition to the National Company's monopoly in Manchester, Valentine became better known than the post he filled and has since then been one of the outstanding figures in telephone circles in this country. On the conclusion of the Manchester episode he returned to an honoured place in the "National" fold, and by the National Company's former staff in particular he will be held in grateful remembrance for the part he played as Chairman of the Committee formed to guard staff interests in connexion with the transfer of the Company's business to the State.

Autocracy of any kind he had no liking for. In discussions with those who were his more immediate assistants he assiduously kept the mere official relationship in the background, and encouraged the free and frank expression of views. If anyone had ideas to contribute to the common stock these were welcomed. Even the appearance of being arbitrary was studiously avoided.

Naturally, therefore, he tried to make consultation with the staff a real thing, and earnestly wanted the Whitley machinery to work. While it was in operation it did accomplish something with not a little creaking of wheels, but the latter was inherent in the machine and did not arise because the lubricant of goodwill was lacking.

In his association with the staff, whether as individuals or deputations, at official meetings or social gatherings, there was never anything of the potentate or benevolent despot. Posturing was foreign to his nature. To be simple and unaffected involved no effort.

As there was nothing of the flamboyant or flashy in his own composition or outlook he disliked it in others. He retained his native Scottish caution as he did the northern accent and may have seemed difficult to move in consequence. His reasons, however, were not like the one given by the Scottish elder when asked why he disapproved of hymns being sung in church: "It is only hymns noo, but it'll be the Virgin Mary next." On the contrary, new ideas were never feared because they meant change of practice; they were received cordially provided they could be proved in.

He was one of the few Scotsmen who went back to the arid north after tasting the milk and honey in the rich pastures of the south, but it was a case of "*réculer pour mieux sauter*," for at the transfer he was brought to London from Glasgow to assist at headquarters with the reorganisation in the country.

Of his work in the London Telephone Service a better appraisal will be possible some little time hence. History has been made during his tenure, for it is no mean undertaking nor one which can escape the chronicler's pen, to commence the conversion of London's huge system from manual to mechanical switching. The trail is being blazed but the promised land is yet afar off.

The telephone service is still too young to have behind it great traditions but it does have a not unworthy record of public service efficiently done by men and women who have unselfishly put their duty to the public first. This may in time become a tradition and if so our colleague, to whom we tender this regretful *Vale* as he leaves the toils of office for the sweets of leisure, will by his example have made no mean contribution. He has filled a trying and responsible post with dignity and success.

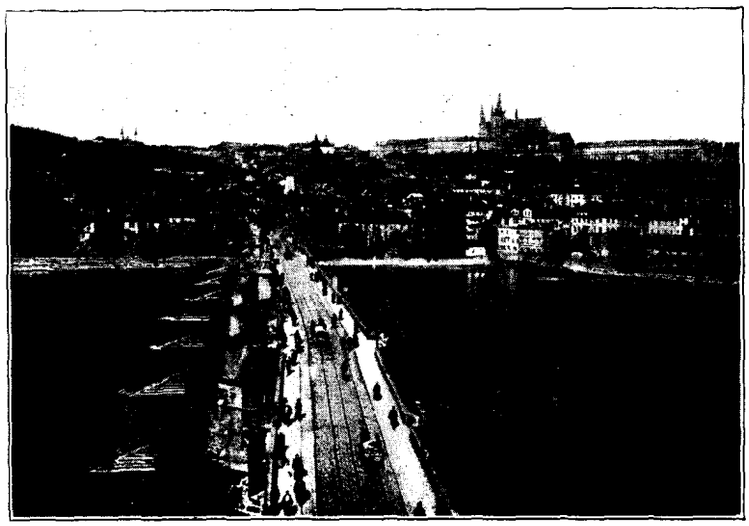
It may not be unfitting, nor a departure from that restraint which is seemly when writing of personal characteristics, to end on a note of praise for the invariable self-control which was a feature of all Valentine's dealings and intercourse with others. Never did it fail even under very great provocation. That is something to be proud of, for does not a wise old book tell us that "he who ruleth his own spirit is greater than he who taketh a city."

J. F. S.

THE PRAGUE CONFERENCE.

NEVER, surely, has an International Conference been held at so ancient and romantic a city to deal with so modern yet romantic a subject as the Conference recently held at Prague on the allocation of wave lengths to the broadcasting stations of Europe. For ten days—from the 4th to the 13th April—the Conference met in a room at Prague, as in a watch tower in the very centre of Europe, and, like an international "policeman of the ether," tried to mark out aerial channels and to regulate the ever-swelling tide of broadcasting traffic.

Reduced to its simplest terms, the problem which the Conference had to solve was "How to get a quart into a pint pot." This is indeed the age-long problem of all traffic experts and must have worried the committee which Noah presumably appointed to design the Ark.



Although wireless has existed only a few years it has developed so rapidly and for so many different types of service that the ether has already become as congested as the Strand. The Washington Conference of 1927 tackled this problem and tried to establish international order. It succeeded in dividing up the available wavelengths among the various classes of services—point-to-point, ship and shore, broadcasting, etc.—but it did not attempt to allocate wavelengths to countries or to individual stations.

During the last few years broadcasting stations have sprung up like mushrooms in every country in Europe, and as the wave-bands available for them are limited it is not surprising that they have interfered seriously with one another. Largely owing to the initiative of the B.B.C., an international organisation of broadcasting concerns, known as the Union Internationale de Radiophonie, was established in 1925 and has done much useful work in connection with wavelengths, exchange of programmes, copyright and other broadcasting problems. The Union drew up a wave-length scheme known as the "Plan de Genève" and later a "Plan de Bruxelles"; but although each of these schemes effected some improvement, they lacked Governmental authority and were disregarded in many countries.

At Prague for the first time the European Governments took over the problem and shouldered the responsibility of allocating wavelengths to individual broadcasting stations in Europe. The British delegates were Mr. Phillips and Col. Lee. In addition, Capt. Eckersley and Mr. Hayes of the B.B.C. and Mr. Carr of the Air Ministry were attached to the British delegation as expert

advisers. The Union Internationale de Radiophonie sent a delegation under Admiral Carpendale, the Controller of the B.B.C., who is President of the Union.

A number of other wireless questions were dealt with; but although they were interesting enough the main purpose of the Conference was the allocation of broadcasting wavelengths; and this question overshadowed all others. In accordance with the usual practice, the Conference set up several committees, which in turn set up sub-committees. It is difficult for a large meeting to settle details; and in one or two cases small sub-sub-committees were established. There is no limit to this process of reproduction, and had time permitted some tiny sub-sub-sub-committees would doubtless have emerged.

Bearing in mind the fact that there are not nearly enough wavelengths to go round, it speaks well for the spirit of the Conference that it eventually reached unanimous agreement on a revised allocation of wavelengths—which will be known as the "Plan de Prague"—and also on general measures for carrying out the Plan and for dealing with future proposals for its modification. The relations between the International Telegraph Union and the Union Internationale de Radiophonie were defined, and recommendations were made to regularise the whole position. The date 30th June, 1929, was fixed for the introduction of the Plan, and it is hoped that it will automatically take effect on that date in all the countries of Europe. The number of wavelengths allocated exclusively to Great Britain—namely one long and nine medium waves—remains unchanged, although there are slight changes in some of the wavelengths themselves.

At the closing banquet Capt. Eckersley and a little band of conspirators managed to smuggle into the room a large toy balloon with a strange looking attachment bearing in bold letters the title "Plan de Prague." This wonderful object was hidden beneath a table, and at an appropriate moment during the after dinner speeches it was allowed to emerge and to float gracefully into the air amid the cheers of the guests. Later in the evening it was released from a balcony and sent out on an unknown voyage over the city of Prague.

The organisation of the Conference was excellent. The Czecho-Slovakian Government took great interest in its work and did everything possible to make it a success. Their officials were exceedingly kind and took pleasure in showing their guests the wonderful buildings of Prague—steeped in historical associations—and the beauties of the surrounding country. The delegates had the honour of being presented to the distinguished President of the Republic, Mr. Masaryk, who lived in London for two years during the War and has many ties of friendship with this country.

It is perhaps hardly realised in Great Britain what a large and thriving city Prague is. Most people imagine it to be a charming old-world town, still living in the shadow of its romantic past. In reality it is a busy, up-to-date city with a romantic background—like a new jewel in an ancient setting.

Will the Plan de Prague prove worthy of its name? Will it be beneficent and durable, or will it prove faulty and short-lived? The answer to these questions will depend almost entirely on the manner in which the Plan is applied. The Protocol signed unanimously at Prague contains much good advice concerning the measures to be adopted to reduce the risk of interference. In particular, it emphasises the importance of every station keeping strictly to its proper wavelength. It is to be hoped that this advice will be followed and that the broadcasting organisations in every country will not only apply the new Plan but will apply it strictly, efficiently and loyally. If this is done, the difficulties hitherto experienced through interference between broadcasting stations will be much reduced, and the Prague Conference will have made a valuable contribution towards the settlement of European broadcasting problems.

F. W. P.

TELEPHOTOGRAPHY.

A FORECAST.

WITHIN the Service, one hears very little or nothing concerning the latest addition to telegraphic systems. Perhaps it is because we are jealous, but the day will come when an addressee will read his telegram and admire his correspondent's handwriting, or curse the latter's defective typewriter. We must, therefore, look for fresh laurels in a new direction.

Scientific history warns us that Telephotography for commercial purposes will be an accomplished fact in the not very distant future, so that with an eye to business and large traffic receipts, it is not too early to study its greatest attraction, which, to the public, is cheap, but efficient service.

It is understood that, under existing conditions, the efficiency of word transmission (or fac-simile) in the system under review, is greatly impaired by the least suspicion of interruption, and that the cost depends upon the area of space occupied.

Now, it is submitted that these conditions can be improved, or rather, such faults be reduced to a minimum, and at the same time, space occupied can be greatly condensed.

Where a sender desires to transmit a message, a code of signs, or symbols, would replace the present method of condensation, such as, for instance, a triangle △ would represent the same phrase as might a ten-letter code word to be found in Bentleys, the A B C, or Liebers, or the Western Union. Perhaps an official code could be compiled on these lines.

It will be seen that if the charges will depend on area of space these symbols will occupy much less space than that taken up by hand or typewriting, and the distinctive shapes would practically be unlimited. Circles, stars, crescents, oblongs, squares, ovals, etc.; manufactured of suitable material, gummed on the back, coloured to assist in successful transmission (if necessary), and of a size sufficient for the purpose could be utilized in various positions to represent the present form of message.

In compiling the code-book, the various symbols in different positions would replace the present code words. A box containing the signs would be supplied to purchasers, and refills, when required, at a small cost.

Maybe, the idea will prove impracticable, but on the other hand, it may provide a basis for profitable research, and the writer will then know that his ink has not been wasted; for many pieces of valuable machinery operating to-day have sprung from a very crude birth.

W. T. LOWE (*Inland Telegraphs*).

[*Note.*—We congratulate Mr. Lowe on the interesting possibilities that he opens up. At the beginning of history picture-symbols were gradually transformed into letters; telegraphists may live to see the reversal of this age-long process. As a modern letter-code purports to afford some *17,000,000,000 combination*, the task of devising a symbol-code to take its place would not be altogether easy. Perhaps the solution may lie in some sort of combination of letters and symbols, either in the form of shorthand, or with symbols and letters combined together in the same telegram. We should like to hear our readers' views on the question.—*Editor*, TELEGRAPH AND TELEPHONE JOURNAL.]

CORRESPONDENCE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—"*Small Office*," referring to the cost of delivering telegrams, submits a scheme which he asserts is bound to come sooner or later. If we are to increase our traffic receipts, I rather doubt this sweeping statement.

Your correspondent appears to forget—if he will excuse my saying so—that in the first place all members of the public, telephone subscribers or not, are our potential customers, and that improving the service would not be of much avail without at least regaining the traffic which we have lost. He says—*compel* all subscribers to receive telegrams by telephone! Whoever heard of a tradesman compelling his customers, or likely customers, to do his bidding? And, using the most discreet methods in the world,

one cannot deny the fact that this is officialdom in its worst form. Isn't that what we are trying to get away from? By all means let us give the system prominence in our publicity campaign, but any suggestion of coercion or force would surely be disastrous.

Our colleague can surely know very little of business when he advocates the following:—

> Appoint subscriber agents within well defined areas paying them a fee for delivery. These subscriber agents would pay the usual rentals for business or private installations, and be credited with the delivery fees in the accounts.
>
> In outlying districts when the cost of delivery is heaviest, make it a condition in the contract that the nearest subscriber to the address must undertake to deliver telegrams.
>
> Such subscribers to be charged a modified rental and paid delivery fees.

We will suppose that a small tradesman is a subscriber, and has been ordered (!) to take a telegram—the context of which refers to business—for his nearest trade rival, who deals in the same commodities, and who is not a subscriber . . . ! Or, are we to assume that the contract will also contain a repetition of the rules regarding secrecy as they affect the staff?

Suppose a stockbroking, or any busy firm, are suddenly ordered (!) to take a message for the waitress at the tea-shop close by!

Imagine Lord FitzPomeroy dictating a telegram for the local blacksmith and being rewarded with a rebate of a few coppers off his account!

The Smiths, of Suburbia—who are on the telephone, have for years been trying to discover a family secret of their neighbours—the Browns—who are not on the 'phone—and are suddenly rewarded and convinced beyond all doubt. And so on, *ad infinitum*.

But I hope that my few words of friendly criticism will not deter "Small Office" from having another shot.—Yours faithfully,

W. T. L. (C.T.O.).

May 10.

BAUDOT MULTIPLEX PRINTING TELEGRAPH SYSTEM.

THE Automatic Telephone Manufacturing Co., Ltd., Strowger Works, Liverpool, have just issued an interesting pamphlet with excellent photographic illustrations and diagrams of the units of the Baudot multiplex system as manufactured by them. Brief and clear descriptions are given of the important modifications in the design of this apparatus which have been introduced by Messrs. L. Doignon.

The changes in design have been specially attractive to European traffic officers responsible for the disposal of large volumes of traffic, to whom the problem of working stability has always appeared so formidable. In so far as the problem resolves itself into the two large factors of the stability of lines and apparatus, the new equipment bids fair to offer a solution to many of the difficulties of the supervising and operating staff who have to rely in large measure upon Baudot installations. The improvements have led to very great simplification in the adjustments for setting and maintaining the apparatus in operation, and the progress in design is noteworthy.

In the distributor the Doignon-Mendonça speed governor, driven by a commercial motor, is utilised. In principle it departs entirely from those which have hitherto been employed for printing telegraphs. Experience has shown that the voltage of the driving motor can be varied by about 35% without affecting the speed, and the load of the driven machine can vary by as much as 100%, also without varying the speed. The speed of running of the governor is controlled by the turning of a single screw-head to right or to left, and by means of this simple governing device the speed may be varied to the extent of 30 revolutions a minute. In the British telegraph service, where a number of these machines have been tried at inland and Continental circuits, the simplicity, robustness and reliability of the governors have already established for them a good name.

The printer unit, which is of the Grunewald pattern, is controlled by impulses from the distributor, which are sent out by revolving commutators from a shaft projecting from the front of the plateau. This simple arrangement has rendered unnecessary the speed moderators of the receiving units, and in the new designs a five-tapper keyboard with a stout mechanical locking device has been fitted compactly in the base of the receiver.

An independent keyboard with electro-magnetic cadence and locking, and also the well-known retransmitter for regenerative circuits, are described and illustrated.

H. B.

LOCAL DIRECTORY INFORMATION.

THE importance of keeping exchange directory information up-to-date need not be stressed, and the procedure followed in order to achieve good results must receive careful consideration from all districts.

In the Liverpool districts the conditions aimed at may be stated as follows:—

1. The necessary changes should be entered in the interleaved directory as soon as possible.

2. Manuscript entries should be kept at a minimum; brevity with clarity being the keynote, so that facilities exist which enable the monitorial staff to complete enquiries with despatch.

In an endeavour to fulfil these conditions, the system at Liverpool has recently been modified and a comparison of the new methods against the old may be of interest to readers of the JOURNAL.

Some time prior to the examination of the old conditions, the exchanges at which interleaved directories were in use had been reduced to four, *viz.*: Birkenhead, Central, St. Helen's and Warrington, these functioning as the directory centres for the Liverpool district. Each of the centres maintained an up-to-date directory covering the district as a whole, and with each centre was associated a selected group of exchanges, every exchange therefore having a ready means of enquiry over available junction circuits.

Typed lists of particulars extracted from completed advice notes were furnished to the directory centres by the District Office thrice weekly, supplemented by telephone advices of new lines.

The particulars contained in the typed lists included new lines, cessations, removals, changes of name, changes of telephone number. The compilation of this information occupied considerable time, and as the completed advice notes were received from the Sectional Engineer on alternate days only, the typed lists were not available at the directory centres for some days after the changes had been made.

It may be mentioned at this stage that an analysis of records taken at various times shows that from 60% to 80% of directory enquiries can be answered satisfactorily from the current printed list.

The modified system is as follows.

Immediately the engineering officer employed on work provided for by an advice note held at an exchange intimates that such work has been completed, the officer-in-charge advises her particular directory centre by telephone only; keeping at the same time a special card record on the local enquiry position. The items telephoned exclude cessations.

The local card record, therefore, supplies the necessary information regarding changes in respect of any subscribers on the home exchange which, together with the cessations pegged on the multiple and noted in the ordinary exchange records enables relative enquiries to be readily answered without reference to the directory centre. This procedure, of course, materially reduces the number of telephone advices and shows a considerable saving of occupied time on the junction circuits.

At the directory centre, the particulars telephoned are recorded and entered in the interleaved directory, and are available to all other exchanges in the district if required, *e.g.*, if Anfield requires the number of Wallasey subscriber, telephone communication is established with Birkenhead, but if Wallasey requires an Anfield

subscriber Liverpool Central is obtained, Wallasey being in the Birkenhead group and Anfield in the Liverpool Central group.

In dealing with an enquiry at an exchange, reference is first made to the printed list and the local card record. By this method all enquiries regarding a home subscriber are answered without recourse to the Directory centre, thus reducing to a minimum the use of junction circuits and monitor's time in respect of enquiries.

At the Directory centres the clerical work involved in the maintenance of the interleaved lists is restricted to information respecting their respective exchange groups and at these centres no local card record is required.

The modified scheme has worked smoothly and is considered to have accomplished the objects for which it was designed.

(1) New lines, etc., are entered immediately they are connected.

(2) No lists are prepared in the District Office.

(3) The majority of the enquiries can be satisfied even without recourse to the Directory centres.

(4) Clerical work at the Directory centres is limited to particulars relative to their respective groups.

The only additional work imposed is the maintenance local card record at each exchange other than a Directory centre, and even this is not all additional, as many of the Exchanges already kept an unofficial note of items which are now entered on the cards.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of April resulted in a net gain of 4,653 stations as compared with 4,143 stations in April last year. It is very gratifying to note the improvement in the April figures and we hope that the improvement has extended to the Provincial Districts, which seem to have suffered just as much, if not more than London, in the first three months of this year.

The development study of London indicated that there were scattered orders to be obtained in areas where there was a lot of small and relatively poor residential property where a Contract Officer would have to make a very large number of unproductive calls for each order obtained. Arrangements were made some months ago with the London Postal Service to deliver advertising literature to every house in a large number of roads in such areas, and the results have been so satisfactory that the area of operation is being extended very considerably.

The results obtained in this experiment and the fact that orders are still being obtained in goodly numbers from the enclosure of post-cards, advertising extensions with the quarterly accounts, has encouraged the preparation of a circular pointing out the value of service and extension points to be distributed broadcast to subscribers and non-subscribers in the City areas. We hope for good results from this experiment.

In discussing means of getting additional orders the other day I was handed the following extract from the *Pictorial Weekly* and told that it showed a sure way to increase the growth of the system ! ! !

"A Strange 'Phone Exchange."

"In north-western Nebraska there is a telephone exchange that is undoubtedly one of the strangest in the world. To a telephone company the sparsely populated area held out no promise of a service that would pay, and fifteen years ago one local resident decided to fix up one himself. Twelve ranchers agreed to have the telephone installed in their homes on the understanding that they were to have a month's service without charge, and the cost of a 'phone was fixed at £3 per year.

"The owner of the service reduces the bill when any of the subscribers have bad crops. And when a subscription is overdue, the defaulters are warned that unless they pay within two years their telephone will be cut off."

There has been, during the last two months, a phenomenal increase in the circulation of the JOURNAL in the Contract Branch. The sales for May amounted to 141 copies, which may be a record number amongst a staff of 266, and shows an increase of 99 over the sale sin March. The Western Contract Office which had the largest sale in March, still maintains that position and disposed of 45 copies in May amongst a staff of 57. The distributors in the various offices certainly deserve congratulations.

Our congratulations to the four District Contract Managers, Messrs. Rutter, Kellond, Brandreth and Livermore, on their promotion to the grade of staff officers and to Messrs. Elsey, Lewis and Pollard on their promotion to Contract Officers Class I.

* * * *

Cricket.—L.T.S.

The L.T.S. cricket season opened at Chiswick on Tuesday, May 7th, with a match against the Engineer in Chief's office. L.T.S. batted first on a good wicket and were rather cheaply disposed of for 95 runs. Widdup batted steadily for 20 runs and Oliver was undefeated with 19 runs. The Engineer in Chief's office obtained the runs for the loss of 5 wickets.

* * * *

Cricket.—Contract Branch.

It is recognised that the task of retaining the Shield which was wrested from the Accounts Branch last year is a formidable one but considerable optimism prevails amongst the team and although one or two players have been lost, several new men are expected to fill adequately the vacancies.

The results of the first three matches will be known by the time these notes are in print, the opening game being against the Accounts Branch on the 15th May, followed by a match against the Traffic Branch on the 21st May, and the Accounts Branch return match on the 27th May.

* * * *

Bowls.—L.T.S.

The season has opened auspiciously by two splendid victories gained against the Clearing House and Savings Bank.

The opening game against the Clearing House was played on the 2nd May and resulted in a win by 53 points to 50. It was a closely contested game with the Clearing House leading until the last quarter of the game.

The match against the Savings Bank was also won by the narrow margin of 9 points the final scores being 68—59.

Detailed results as follows :—

v. Clearing House 2nd May, 1929.

Rink 1.—Grove, King, Collins, Ragbourn.—Lost 16. 24.
Rink 2.—Hutchison, Evennett, Heard, Cleland.—Won 16. 14.
Rink 3.—Wilson, Dickinson, Gregory, Livermore.—Won 21. 12.

v. Savings Bank, 13th May, 1929.

Rink 1.—Wilson, Evennett, Heard, Cleland.—Won 22. 19.
Rink 2.—Hutchison, King, Collins, Livermore.—Won 21. 17.
Rink 3.—Mantle, Grove, Demment, Ragbourn.—Won 25. 23.

The programme of remaining matches in May and during the month of June is :—May 21st, *v.* Cavendish ; May 29th, *v.* Board of Education ; June 11th, *v.* Customs and Excise ; June 20th, *v.* L.P.S.

* * * *

Tennis.—L.T.S.

The Season commences with the first round for the "Agnes Cox" Cup which is to be played by the 1st June.

Entries have been received from 23 teams and the competition promises to be interesting.

In addition to this the Assistant Controller, Mr. M. C. Pink, has very kindly offered a Cup for a "Singles" competition. Each Exchange and Office Section were invited to nominate a representative player with the result that 24 entries have now been received. In this instance also the first round has to be played by the 1st June. The second round has to be finished by the 1st July, the third by the 1st August, and the semi-final by the 1st September. The date of the final will be announced later. These particulars refer to both competitions.

* * * *

Netball Competition.

The L.T.S. Netball Final for the Liddiard Shield was played at Chiswick on Saturday, May 4th, between the Controller's Office and Central Exchange. Miss Liddiard was present.

It proved to be a very interesting and exciting game for the onlookers, as can be seen by the result. The winning team was the Controller's Office who won by the narrow margin of one goal. Result 11—10.

A Knock-Out Tournament was also arranged, which was well supported. Eighteen L.T.S. clubs competed, the final being between Clerkenwell and Chiswick Exchanges, the first-named winning by seven goals to three.

The Liddiard Shield, medals and prizes were kindly presented by Miss Buchanan (Woman Establishment Officer of the Secretary's Office), whose presence was much appreciated.

PROGRESS OF THE TELEPHONE SYSTEM.

THE following gives a brief review of the growth in the telephone system during the past financial year.

During the last month of the year, the total number of stations working in the Post Office system passed the one and three-quarter-million mark, the total number at Mar. 31 being 1,754,641. The net increase in stations for the year was 123,450.

The growth for the year in London, England and Wales (excluding London), Scotland and Northern Ireland was as follows :—

NUMBER OF STATIONS.

	At Mar. 31 1928.	*At Mar. 31, 1929.*	*Increase.*	*Increase %*
London	578,322	626,714	48,392	8.4
England & Wales (excluding London) ...	883,435	948,934	65,499	7.4
Scotland	148,934	157,169	8,235	5.5
Northern Ireland ...	20,500	21,824	1,324	6.5
	1,631,191	1,754,641	123,450	7.6

Residence rate installations at Mar. 31, 1929 numbered 150,093 in London and 236,658 in the Provinces, the total of 386,751 representing an increase of 41,625, or 12.1% for the year. This compares with an increase of 26,637, or 4.4% in business exchange installations for the same period. The net increase in residence rate installations represented 61% of the total net increase in subscribers' exchange installations (i.e., business and residence combined) for the same period. Residence subscribers at Mar. 31 last represented 37.8% of the total exchange subscribers.

The number of Public Call Offices (including Kiosks) working at Mar. 31 last was 25,864, of which 5,599 were connected with London Exchanges and 20,265 with Provincial Exchanges. The net addition for the year was 1,810 (7.5%). Of the net increase of 1,810 Call Offices, 1,591 (88%) were Kiosk Call Offices, and at Mar. 31 last the Kiosks connected with London Exchanges numbered 1,273 and with Provincial Exchanges 5,005, giving a total of 6,278. Practically a quarter of the call offices now working are kiosks.

During the year ended Mar. 31, 1929, 126 new exchanges were opened under the Rural Development Scheme of 1922, bringing the total number of exchanges opened under the scheme up to 1,267. In addition to the 1,267 opened, there were at the end of March a further 79 in course of construction.

The total number of exchanges working at Mar. 31, 1929 was 4,476.

The number of rural-party line stations at the end of March last was 10,456, an increase of 241 or 2.4% on the total a year previously.

Further considerable progress was made during the year 1928-29 in connecting railway stations in rural areas with the public telephone system, largely as the result of the arrangements agreed upon with certain railway companies in regard to the provision of call office circuits. During the twelve months ended March last, 199 railway stations in rural areas were connected with the telephone system, bringing the total number connected up to 1,106. In 751 cases rented circuits have been provided, and in the remaining 355 call office circuits. The net addition in call office circuits during the past year was 135, as against a net increase of 64 in rented circuits.

At the time of going to press, the results for the last month of the year 1928-29 in respect of trunk calls were not available, and particulars of the year's traffic will be given in the next issue. Particulars of the February traffic, which have not yet been quoted, are as follows :—

The total number of inland calls dealt with was 8,476,900, representing an increase of 428,906, or 5.3% over the corresponding month of the previous year. (In Feb. 1928 there was, however, an extra day—leap year.) Outgoing international calls numbered 41,710 and incoming international calls 44,592, representing increases of 11,851 (39.7%) and 12,931 (40.8%) respectively, over Feb. 1928.

Further progress was made during the month of April with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Upminster.

PROVINCES—Broadstairs ; Colchester, Southend-on-Sea Marine, Leigh-on-Sea, Hadleigh, Thorpe Bay, Rochford (all automatic) ; Collier Street, Rendham, Sinderby, Hampton (Cheshire) (all rural automatic),

and among the more important exchanges extended were :—

LONDON—Greenwich.

PROVINCES—Ascot, Bournemouth, Gateacre, Glasgow (Western), Lowestoft, Pendleton, Rickmansworth, Skipton, West Bromwich.

During the month the following additions to the main underground system were completed and brought into use :—

Box—Chippenham cable,

while 87 new overhead trunk circuits were completed, and 92 additional circuits were provided by means of spare wires in underground cables.

CIVIL SERVICE DRAMATIC SOCIETY.

ONE ACT PLAY COMPETITION.

OWING to the success which attended the One Act Play Competition in 1928, the Civil Service Dramatic Society has decided to hold a similar will be paid to detail and the competition organised on a more extensive scale.

Entry is open to the whole of the Civil Service, provided applicants become Acting Members of the Society. The entrance fee is 3/-, which will admit to the Final Competition and Dancing afterwards.

The date of the competition is dependent on the availability of a Hall, but it is hoped to hold it during the week commencing 23rd September.

Individual applications to take part in plays to be produced by the Civil Service Dramatic Society should be sent to Mr. P. W. Nash, 9, Palmers Road, East Sheen, S.W.14, by the 10th June.

Further details concerning the competition and the conditions of entry for Departmental Societies will be promulgated in due course.

OBITUARY : MR. W. DALTON, PRESTON.

IT is with the deepest regret that we have to record the passing of Mr. W. Dalton, Traffic Superintendent, Class 2, in the North-Western District, Preston. Mr. Dalton, who was only 42 years of age, was taken ill just before last Christmas, and although at one time hopes were entertained of his recovery, he grew gradually worse, and died on May 10. The interment took place at Penwortham on May 13, and practically the whole Traffic Staff, and various other members of the District Office Staff, were in attendance to pay a last tribute of respect to their late colleague.

There were also present representatives from the Surveyor's Office, Superintending Engineer's Office, Preston Post Office, and from the Chester and Liverpool District Manager's Offices.

In addition to the wreaths sent by the District Manager's Staff and by Mr. Dalton's intimate colleagues in that Department, there were also floral tributes from the Supervising and Telephone Staff of Westmorland and Cumberland, Head Postmaster and Telephone Staff Blackpool, Head Postmaster and Telephone Staff Barrow-in-Furness, Head Postmaster and Telephone Staff Blackburn, and from the Telephone Staff of Lancaster and Morecambe, and also from the Liverpool Traffic Staff.

STAMFORD DRAMATIC SOCIETY.

THE first season of this Society, which is the Dramatic Society of the London Telephone Service, was brought to a successful close with two performances of "Tilly of Bloomsbury," by Ian Hay, at the Blackfriars Theatre on the 29th and 30th April last. It is just over twelve months since the Society was formed under the Presidency of our late Controller, W. A. Valentine, Esq., C.B.E., and their first play, "The Young Person in Pink" was, it will be remembered, very auspiciously staged last November. "Tilly of Bloomsbury" is a more ambitious undertaking, but the cast was equal to the occasion and the play was well received by most appreciative audiences which filled the house on both nights.

Richard Mainwaring, heir to the Mainwaring millions, becomes engaged to Tilly Welwyn, a girl in humble circumstances, shortly after a chance meeting on the top of a bus, and the course of their love through difficulties arising from their unequal station provides a story with a pleasing note of sentimentality and abounding with amusing situations. Miss F. Farey as "Tilly" completely won the hearts of the audience with her charming

TILLY OF BLOOMSBURY.

Dicky: "I WONDER—HAVE YOU EVER LOVED ANYONE BEFORE?"

naïveté, and had a handsome suitor in Mr. F. Crossley as "Dick." Mr. A. E. Messenger as "Stillbottle" gave an original and highly humorous characterisation of the cockney broker's man. The part of Mrs. Welwyn, Tilly's good-natured and devoted mother, was faithfully played by Miss I. Smith, while Mr. P. Smith as the father gave a dignified portrayal of the philosophical tippler once Fellow and Tutor of his college. Miss P. Lee was a sweet little "Amelia," and the part of Lady Mainwaring was taken by Miss E. Wilson with graceful austerity. Mr. H. G. Dean as "Abel," her ladyship's henpecked husband, added much to the enjoyment of the show. A light key was interduced by Mr. A. Strevens with his bright and breezy rendering of Perce, Tilly's self-assured brother. We must not omit mention of Miss V. Jeffrey as "Grandma Banks," and Mr. H. M. de Borde who took the part of "the Rev. Adrian Rylands." Both in their respective ways were extremely funny, and the loud applause accorded Mr. de Borde was a tribute to his version of the conventional comedy curate. Miss E. A. Hobdell (Sylvia), Miss V. Mc Kenzie (Connie), Mr. H. Clayton (Mehta Ram), and Mr. L. Craft, who doubled the roles of the Butler and of Mr. Pumpherston, all ably filled their respective parts. The play was produced by Mr. Andrews O. Buck, who merits the highest praise for the care and thought he gave to its production. An "all Service" orchestra under the able direction of Mr. J. Curr, A.C.V., provided tuneful incidental music.

Members of the Society may look back with satisfaction upon a most successful inaugural season, for which considerable credit must undoubtedly be given to their enthusiastic and capable Secretary, Miss Dorothy Coleman. We await with pleasure and confidence the production of further plays by this active Society during their next season.

A DEFENCE OF THE TELEGRAPHS.

AN analysis of the inland telegraphs position and prospects was given to the Manchester Rotary Club on Thursday by Mr. T. E. Herbert, assistant superintendent engineer (S. Lancs.).

"It is only fair to point out," he said, "that in the seventies and eighties, before the advent of the telephone, telegraphs were developed in such a way as to bring every village and hamlet within reach of their fellows. In times of urgent distress or necessity, who can possibly assign a money value to the lives saved or anguish mitigated? Then, too, the value in developing rural business interests must not be overlooked. But all this was philanthropic work recognised as such by Parliament, who time and time again extended the facilities. What the Press of the country owe to telegraphs can best be explained by telling you that 2d. is charged for extra copies of a 100-word message. This philanthropy of an earlier generation must have done much for the development of a cheap, reliable, and popular Press. To-day, the great newspapers have no need for any such privileges, but we may wonder whether a service at actual cost to the State might not embarrass some of the smaller papers."

What was the function of telegraphs with a highly developed telephone system? Mr. Herbert answered the question by a quotation from Mr. Donald Murray: "Telegraphs should be carrying much that goes in the mail bags. Speeding up business increases profits, and it ought to be profitable to the nation to expand the telegraph service by giving cheaper, better and quicker service." In America, many large concerns leased private telegraph wires, as did most of our newspapers here, connecting branches and factories. The discussion of business matters by telephone over long distances by this method was costly; and decisions taken or bargains made generally required written confirmation, for it must not be forgotten that mistakes were possible even when using the telephone. The value of the telegraph to the general community lay in the quick delivery of urgent messages from and to relatively remote places, the quick confirmation of urgent inquiries demanded by the ever-increasing stress of business operations, its value as an alternative in the event of telephone interruptions, and its strategic value in case of war.

The speaker dealt with the methods of operating telegraphs and showed that the newest infra-acoustic or sub-audio-telegraphy systems did away with the necessity for main telegraph cables altogether. The messages could be sent at high speed over the telephone cables without in any way affecting speech transmission. This system was superseding all others, but though it would vastly reduce the cost of telegraph plant, it would not solve the financial problem of the inland telegraphs. The very large amount of human labour necessary in transmission, reception and delivery of messages was the fundamental cause of this problem.

DEATH OF A FORMER JERSEY POSTMASTER.

WE regret to learn of the death of another of the old school in the person of Mr. Charles Fenton, a former well-known Assistant Superintendent at T.S. and T.N.S., which took place at his Shanklin residence on April 24, in his 75th year. Entering the old Electric and International Telegraph Company in 1868, the late Mr. Fenton was, in 1870, appointed to Southampton on the transfer of the telegraphs to the State, where he served nearly 4 years. Then, at the desire of the late Sir Henry Fischer, the then Controller of the C.T.O., he, with the late Messrs. R. D. Binsted, H. E. P. Gill, E. Parker, F. Preston, W. Waterman and others, was transferred to T.S. and placed in the Second Class of telegraph clerks. Mr. Fenton was subsequently appointed to the *Scotsman* (Edinburgh) special wire in Fleet Street, later becoming a First-Class Telegraphist, continuing there several years until his appointment as an Overseer and Senior Telegraphist in 1886, when he was recalled to T.S. He became a Second-Class Assistant-Superintendent in 1894 and was promoted to the First Class in 1902, then taking duty at the Stock Exchange and Threadneedle Street offices. In 1908 he became Postmaster of Jersey, and retired from that post on reaching the age limit in 1915, since which time he has resided in the Isle of Wight.

J. J. T.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 168.)

1880, June 26 ... F. A. Gower patented a telephone transmitter containing eight carbon pencils arranged in the form of a star.

1880, July 1 ... C. Moseley, W. F. Bottomley and W. E. Hayes patented a "twist" or "rotated" system for telephone wires.

Alexander Graham Bell made an Officer of the French Legion of Honour and awarded the "Volta Prix" of 50,000 francs. He also received the Albert Medal.

C. Williams, jun., of Boston, U.S.A., devised a sliding spring-peg telephone switchboard.

American Bell Telephone Company was formed and acquired the National Bell Telephone Company.

(Western Electric Company introduced a multiple system of wiring for telephone exchanges.

J. Poole published "The Practical Telephone Handbook."

McGregor devised a Call Register for telephone working.

Sandford Fleming, commenting on a suggested cable from Asia to America across the Pacific, urged that the American end should be on Canadian soil.

Edison introduced an electric lamp with a carbonised bamboo filament.

Swan exhibited to the Society of Telegraph Engineers an electric lamp with filaments of carbonised cotton. Edison and Swan formed a company to work their patents.

Creosoted telegraph poles erected between Fareham and Portsmouth in 1848-49 found to be in excellent condition.

1880, Nov. 22 ... Post Office Savings Bank commenced to purchase Government stock for depositors.

Paul la Cour, of Copenhagen, devised a plan for synchronised telegraph working, which included a "phonic wheel" for driving a distributor.

Faure constructed a form of electrical accumulator.

Postmaster General (Mr. Fawcett) introduced Post Office Savings Bank deposits by means of postage stamps affixed to forms, thereby enabling children to save penny by penny.

Postal Conference held in Paris with the object of establishing an international parcel post.

Charges for foreign telegrams ranged from 2½*d.* to 16*s.* 9*d.* a word.

1880, Dec. 13 ... Post Office proposed to proceed with negotiations for licensing telephone companies, who had contested the Postmaster-General's monopoly, and to establish Post Office exchanges in a "wide and comprehensive manner." The Treasury gave only restricted authority as regards the latter proposal.

1880, Dec. 20 ... Judgment given in favour of the Post Office claim that a telephone is a telegraph, and a telephone conversation is a telegram, within the meaning of section 4 of the Telegraph Act, 1869. Licences were thereupon taken out by companies for 31 years, the Department to have the right of purchase at the end of 10, 17 or 24 years. A five-mile radius limit for exchange areas was imposed.

1880, Dec. 22 ... W. Johnson patented a telephone transmitter containing two carbon pencils.

1881, Jan. 1 ... Postal Orders introduced in United Kingdom at values ranging from 1*s.* to 20*s.*, with poundage ½*d.*, 1*d.* or 2*d.*

Atlantic cable laid for Western Union Telegraph Company.

M. F. van Rysselberghe, of Brussels, installed his telemeteorograph between the Brussels Observatory and the meteorological station at Ostende.

At the Paris Universal Exhibition of Electricity, music was transmitted by means of microphones installed at the Opera House. Queen of the Belgians at Ostende was able to listen to the Opera at Brussels.

A. C. Brown, of the Eastern Telegraph Company, suggested an inductive method of communicating with moving trains.

1881, Jan. 7 ... Leroy B. Firman, of Chicago, patented a multiple telephone switching system.

London and Globe Telephone and Maintenance Company formed.

First dry-core cable laid at St. Louis.

National Bell Telephone Company, American Bell Telephone Company and Western Electric Manufacturing Company consolidated as the Western Electric Company. The American Bell Telephone Company retained control.

(F. Shaw, of the Law Telephone Company, New York, devised a "call wire" system by means of which all subscribers could communicate their requirements to the exchange operator, who listened continuously. J. D. Miller and J. J. Mann improved Shaw's "call wire" telephone system.)

1881, Mar. 10 ... National Telephone Company formed.

1881, Mar. 16 ... Joseph W. Swan addressed the Philosophical Society of Glasgow on his method of electric lighting by incandescent lamps.

Sir William Thomson's residence lighted electrically.

1881, May 14 ... W. R. Patterson, of U.S.A., patented a cable composed of jute- or cotton-covered wires with an insulation of gas-impregnated paraffin. Paper took the place of cotton subsequently.

Ader devised a telephone receiver with an almost circular magnet (which was employed by the Société Générale des Téléphones in France) and a telephone transmitter containing ten carbon pencils. The system was exhibited at the Paris Exposition.

International Congress of Electricians held in Paris. System of electrical units adopted universally.

Faure improved Planté's secondary cell by coating the lead plates with minium. Sellon and Volckmar also used minium.

Faure also coated the plates with lead oxide paste and Sir Joseph Swan introduced the pure lead lattice grid coated with paste.

(*To be continued.*)

C.T.O. NOTES.

Promotions.

Messrs. W. Hume and T. H. Brooks, Assistant Superintendents to Superintendents (L.G.); H. J. Jordan, F. R. White and E. R. Morton, Overseers to Assistant Superintendents; Mr. A. E. Millett, Overseer Provisional to Overseer; and Mr. P. S. Pamment, Telegraphist to Overseer Provisional.

Retirements.

Superintendent L.G.: Mr. C. W. Sparkes; Assistant Superintendents: Messrs. H. J. Archer, G. H. Clair; Overseers: Messrs. E. T. Lock, W. S. Read; Supervisor: Miss A. E. Gower; Assistant Supervisors: Misses M. E. Crowley, S. A. Purser, A. Bell; Telegraphists: Miss A. E. Powell, Messrs. W. F. G. Garland, H. Elliman.

Sports.

Preliminary Notice.—The "Centels" Annual Sports Meeting will be held at Chiswick on Friday, July 12.

"*Fortels*" *Sports Club Concert.*—A highly successful Smoking Concert of the Cable Room Sports Club, under the chairmanship of Commander E. L. C. Grattan, was held a short time back. An opportunity was taken during the evening to present the Club Trophies.

Music.

City of London Male Voice Choir.—The Choir held a successful Concert at the Sunday School Union. The concert was opened by an anthem sung in memory of the late Mr. John Lee, who was the Choir's President. Miss Tomchinsky, the young Russian violinist, delighted the audience with her playing. Mr. Leonard Salisbury and Mr. Kelmore Scott sang cleverly, and everyone appeared satisfied with "Our Choir."

Windows.

SHE is really most remarkable. I should never have thought of writing on such a subject, but she—eh ? why, the Editress, of course. I thought I'd told you. As I was about to remark, I was poking round her waste-paper basket hoping to discover some sort of inspiration. Sometimes I find in it a choice morsel or two which gives just that necessary touch of the onion to the tripe I inflict upon you. Whilst poking I heard a step, and on looking up I was confronted with an editressial frown. I realised at that moment how thankful I was that nature had not fitted me with celluloid eyebrows, because my blush would have consumed them in a flash. "Well ?" said she, her brow darkening. "Yes, thanks," I said, "er—I mean that er—I was looking for my increment form, er—it seems a bit overdue." "Go away," she said, "and write about windows." Just that, no more—windows !

Windows ! Just fancy, I don't know anything about windows. There are, of course, those at home—those that I clean and those that I don't, and the latter outnumber the former by infinity. .Camou says—but perhaps I'd better not go into that, it's too painful (I disclaim any intention of a pun—it just happened). Since then I have thought so much about windows that I have been glad to press my fevered brow against the cool plate glass windows of Robes et Modes.

Windows vary in shape, size and character, but in purpose they seem to be divided between those through which we look outwards and those through which we look inwards. Some appear to be neutral because they are dark, but the darker the window the more perfect the reflection. Look into them and they reveal the burning glory of a westering sun or the wonders of an eclipse. They give back as much beauty as they receive. If we have been prone to flatter our face they, on their part, have repeated nothing but truth. Their candour is a challenge to us to preserve beauty and to create it.

The window through which we look outward gives a vista of the world and through it we escape from ourselves. We see the birds hopping to and fro unmolested, the trees, the flowers. We watch the slashing rain, the stinging hail, the swirling snow. Or we see forests of chimneys wreathed in black smoke, range upon range of monotonous roofs with broken tiles and encrusted bricks. And we watch men and women going up and down the world living as we have never lived or cannot hope to live—some made and some broken, some who are friends and some who are friendless. Reach out through that window and a hand-clasp with either is the hand-clasp of friendship.

To look through the inward window is to perceive unusual aspects of the commonplace. The room seems more comfortable than we thought ; even the flicker of the firelight conveys a warmth of welcome, and the chairs invite us to their cosy depths. Through that window the golden sunlight streams to glorify the bride at the altar, or to bathe the face of a sleeping child in heavenly purity, or to bring peace and hope to the sufferer. Through it we gaze into the castle and into the garret, seeing people as they are, getting nearer to them and realising that, after all, they are men and women. Through the windows of the streets we inspect the merchandise of the world, and we are amused or bored, envious or filled with an unsatisfied yearning that makes the soul sick.

I stared owlishly through windows set in horn rims and wondered vacantly whether, indeed, the window-cleaner were not a messenger from the gods sent to keep the windows of the world clear that men might see and know all things and each other. PERCY FLAGE.

[Not content with giving his wife our name—for are we not the original Camou Flage ?—Percy alleges that *we*, as a change from our W.P.B., inspired him to write the above article ! The allegation is as transparent as his "Windows."—ED.]

Something to Look Back Upon.

The London Telephonists' Society has given its members many pleasant evenings, but none more so than that of April 26 last, when, at the Institute of Electrical Engineers, Dr. Thomas Watson, of U.S.A., spoke to us about "*The Birth and Babyhood of the Telephone.*" We had, too, the delight of seeing Mrs. Watson, who accompanied her husband, and whose bright face was a joy and an inspiration to the audience as well as to the Doctor. The large audience would have been still larger had not a number of people gone by mistake to the building in which our meetings are generally held, and found then that it was too late to rectify the error. They have our sincere and unqualified sympathy.

Mr. Dive, our President, was in the chair, and he introduced Dr. Watson to the meeting in his happiest way, and with that aptness of phrase which we always expect from him, and which adds in no small measure to the total sum of the success of an evening.

The Doctor's charm of manner was instantly felt, and for an hour we listened with the keenest appreciation to what was in every sense of the word the romantic story of the telephone. We wished that we had had the added privilege of hearing the Doctor's voice uplifted in song—one of those with which, when the telephone was invented, he used to hold American audiences spell-bound—"Hold the Fort," "Yankee-doodle," "Pull for the Shore," "Auld Lang Syne" ; appropriately, "Throw out the Life Line," and, inappropriately, "Do not trust him." We *did* trust him—on sight, and our hope is that before he leaves England, he will again "entrance our senses and delight our eyes," or, if that pleasure is denied us, that we shall one day meet the Doctor in his beloved America. Meanwhile, the sonnet that follows expresses, in a small way, the feelings with which he inspired us :—

Shall we compare you to a summer's day,
Now we have seen you, and have heard you speak ?
Ah, no ! Such praise is far too faint, too weak.
That genial warmth, that smile so blithe and gay ;
The charm of voice, the joyous, friendly way
In which you greeted us—no moments bleak.
As summer shows, you gave, but e'er did seek
To spread bright sunshine, and its beams display.
Dear Dr. Watson—we do not forget.
You gave us of your best from memory's store,
The dreams of youth, of high adventure set
Before your boyish eyes—young manhood's lore.
These things remain—and you are with us yet,
Enshrined within our hearts for evermore.

Opening of the Queen Mary's Wing of the Elizabeth Garrett Anderson Hospital.

The party of seven who represented the London Telephone Service when Her Majesty the Queen performed the opening ceremony on May 8 had a very happy experience ; their only regret being that all their colleagues who had helped so generously towards the "Purse" which was presented to the Queen on their behalf could not be present also. When the presentation was being made the Treasurer informed Her Majesty that it represented a gift of over £2,000. (The actual amount was £2,220, of which £2,000 was given to the Endowment and £220 to the Building Fund).

After the Queen had declared the New Wing open, she made an inspection of the Hospital, visiting every patient, and, like a true mother, asking specially to see a baby boy who had arrived during the early part of her visit.

We, too, made a tour of the Hospital subsequently, and we only wish that every one of you could see it. Advantage has been taken of the building of the "New Wing" to fit up the whole hospital with the most modern equipment possible. Amongst other things, we saw beautiful lamps in the operating theatre which can be so adjusted that the hands of the surgeon throw no shadows on her work. The out-patients' department, too, has been brought up to date, a canteen has been provided, and the consulting rooms are so arranged that patients are summoned from the waiting room by visual signals, and complete privacy is secured for each patient during the consultation.

There is, however, one thing about the Hospital which has remained unchanged from the date of its foundation 62 years ago, and which you feel directly you enter its doors—that is the spirit of loving service in which it was conceived and in which it has always been carried on "by women—for women." It is no institution, but a real hospital for the healing of the sick.

The Secretary has promised to arrange shortly for further parties to be shown round the Hospital. We are anxious that as many as possible should go, and we feel certain that they will come away, as we did, feeling that it will be a privilege to be allowed to have a further share in this work of healing.

A. C.

[The London Supervisors and Telephonists excel, as we know, in every field of sport, on the concert platform, in amateur theatricals—whatever they find to do, they do it with all their might. But their greatest achievement must surely be that of giving. Practically the whole of the "Purse" presented to the Queen was raised by them; as was the sum of £2,422—another record—given last year to the Hospital Saturday Fund. The men at St. Dunstan's, the National Sanatorium, Benenden, and many kindred institutions also have reason to be grateful to the "Hello" girls, not only for regular subscriptions, but for their services so willingly, sympathetically, and regularly given.

Not in the unfair and uninformed criticism so prevalent in the Press to-day do we get a true presentment of the "Telephone girl"; but rather in these continual acts of generous loving-kindness; and it is good for us to turn sometimes to her real picture. We are very proud of and grateful to our colleagues.—ED.]

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

RETIREMENT OF MISS M. F. BUTLER.

MISS M. F. BUTLER, Chief Supervisor, Victoria Exchange, retired from official life on March 31st. She started life in the late National Telephone Company, in the year 1883, and was appointed Clerk in Charge of the Westminster Exchange in 1898. At the time of the transfer of the Ex-National Telephone Company to the Post Office, Miss Butler was chief Supervisor at the Kensington Exchange and since then she has been in charge at Holborn, London Wall and Victoria.

Miss Butler's vast experience of Exchanges made her well known in the service and she was esteemed and loved by all who knew her. She was strict but kindly, and very sympathetic to any who were in distress.

A reception was held at the Victoria Exchange on the evening of March 27th, when Miss Butler was presented with a number of beautiful gifts and two cheques. Miss Cox the Superintendent, F.E.S., presented the cheque from friends and colleagues in the Service, and Mr. Oldham, the Section Superintendent presented a cheque from the Staff at Victoria Exchange.

The reception was followed by a Supervisors Dinner, which was held on the evening of April 9th, at Stewarts Restaurant in Regent Street, a very enjoyable evening was spent. The Company assembled numbered 140, and included two senior chiefs who retired from the Service some years ago, Miss Ralph and Miss Newman. Miss Cox, the Superintendent, F.E.S., acted as chairman for the evening.

Miss Butler, who received the guests, was presented with a number of beautiful bouquets, sent by the staff from various Exchanges, and when she finally sat down to dinner she could scarcely be seen for flowers. After dinner a musical programme was provided by the guests. The Misses Amy and Garney presided at the piano, and the Misses Brereton, Foster, Gilbert Kemp and Longman gave musical items. Altogether a very happy evening was spent, and after Auld-Lang-Syne, we said good-bye to Miss Butler.

And so another senior woman has passed from official life.

A. E. R.

NATIONAL SANATORIUM—BENENDEN.

THE last Concert of the Season, organised by the Staff of the London Telephone Service under the direction of Miss Margaret Worth was held on Saturday, the 13th April.

The Artistes were :—Miss Nellie Beare, Soprano, Miss Margaret North, Mezzo Soprano, Miss Mollie Aldridge, Entertainer, Mr. Bob Douglas, Scotch Character Humorist, Mr. Arthur Hemsley, Baritone, Mr. Hugh Williams, Tenor, and Mr. John Harris, Entertainer and Accompanist.

The Concert was declared by all to have been the best ever given at the Sanatorium. Opening with "Sea Chanties," conducted with Mr. Williams, following on with duets by Miss Beare and Miss Worth, the programme went with a swing. Bob Douglas was in great form and although encores were prohibited in the first half, the patients clamoured for more. Mr. Harris and Miss Aldridge completed a feast of humour. The Quartettes "The Torpedo and the Whale (Audran), and Strange Adventure (Gilbert and Sullivan's Yeoman of the Guard)" proved that concerted numbers were exceedingly popular.

A report of the Concert would not be complete without reference to the charming singing of Miss Nellie Beare, and the warm reception given to Mr. Arthur Hemsley for his splendid rendering of several ballads. A most enjoyable evening both to artistes and audience was brought to a close by singing "Auld lang syne."

Before leaving the Hall, the Medical Officer in charge, proposed a cordial vote of thanks to the party and to the staff of the L.T.S. He referred to the immeasurable good such visits did to the patients. The entertainment, he stated, was a real bright and sparkling tonic. Particular mention was made of Miss Worth's work in securing the artistes, arranging the programmes and furthermore, of the part she fills in assisting with musical items from time to time.

In responding for the L.T.S. and artistes, Miss Worth assured the Staff and patients that it was a pleasure to herself and colleagues to pay these periodical visits to the "San" and particularly mentioned those professional friends outside the Service who so willingly offered to help. With their customary hospitality the Matron and Staff provided tea and supper for the party and after the latter meal, Mr. Williams claimed the privilege once more of expressing the appreciation of the artistes for all that had been done for their comfort. An outstanding feature of these Concerts is the welcome the Artistes receive from the patients when they distribute cigarettes, chocolates, sweets, etc., provided by the Staff of the L.T.S. after the programme has finished.

Doubtless some of them, particularly provincial patients, rarely see a visitor, and they have come to regard the Concert Party as personal friends, with the result that the after meeting developes into a sort of re-union. The patients, staff, and indeed the artistes are all looking forward to next Season's series of Concerts and feel sure that the Staff of the L.T.S. will once more make a very generous response when the appeal is launched for funds to provide these entertainments.

OBITUARY.

MR. J. J. O'CONNOR, READING.

READING has lost one of its better-known citizens by the death on Tuesday, the 7th inst., of Mr. J. Joseph O'Connor, late Contract Manager for the Post Office Telephone Service, Reading District, and recently Secretary of the Reading Chamber of Commerce.

Mr. O'Connor entered the service of the National Telephone Company at Brighton as a Contract Officer when that Company was in competition with the Brighton Municipal Telephone Service, and was later promoted to the rank of Senior Contract Officer.

On the opening of a Contract Department in the Reading Telephone District in 1906 Mr. O'Connor was promoted to the rank of Contract Manager and transferred to Reading. He continued in the same rank on the transfer of telephones to the Post Office in 1912 and retired in 1923.

His position in the Telephone Service was concerned with the development of that undertaking in Berks, Bucks, Oxon and parts of a number of neighbouring counties. He carried out this duty with considerable energy, and during his tenure in the Reading district saw the number of telephone stations grow from 3,604 to 16,785, to serve which there was also a considerable increase in telephone exchanges and call offices.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXVI.

SIR BASIL BLACKETT, K.C.B., K.C.S.I.

SIR BASIL BLACKETT is likely to become better known to Post Office men in his business capacity as Chairman of the Communications Company than he was during the course of his short but brilliant career as a Civil Servant. It is therefore quite appropriate that we should include him among the Telegraph and Telephone men whom the *Journal* introduces to its readers.

Sir Basil was educated at Marlborough and Oxford and entered the Treasury through the Class I examination (in which, we believe, he took first place) in 1904. During the War he was entrusted with more than one financial mission to the United States, and from 1917 to 1919 represented the British Treasury at Washington, returning to Whitehall

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for three years as Controller of Finance. They were followed by six years in India as Finance Member of the Government, where a singularly successful administration was marked by the reorganisation of Indian finances and the restoration of stability under very difficult political and economic conditions. On his return from India in 1928 he left the Service, becoming a director of the Bank of England.

A strong man in every sense, he combines with great intellectual powers a breadth of vision and an openness of mind which qualify him in a special degree for dealing with complex questions in a period of rapid change and development. Telegraphic communications are, we believe, a field of activity which is new to him: but his past achievements in other fields are a guarantee of his success. His modesty and accessibility endear him to his associates, and all Civil Servants will wish him well in his new position.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

VI.—BY A PROVINCIAL CHIEF SUPERINTENDENT OF TELEGRAPHS.

[NOTE.—*The Editing Committee accepts no responsibility for the views expressed in this series of articles.*]

CAN the Telegraph Service be improved? The answer is in the affirmative, but it should be understood that this remark is not intended to support those sensational newspaper articles which describe in terms more imaginative than veracious the chaotic and other awful conditions into which the Telegraph Service is alleged to have drifted.

All thoughtful people must realise that the service to-day affords opportunities for almost boundless improvement, notwithstanding the fact that the present organisation and standard of staffing are capable of providing a reasonably satisfactory service, not one whit inferior to that which obtained, say, before the War. Yet although it is unnecessary to remind anyone connected with the Telegraphs that the prime object of his calling is to provide an efficient and economical service, it is not easy to indicate a standard by which the desired efficiency can be measured. Telegrams are urgent communications: but their urgency varies. Roughly, all telegrams can be divided into two classes—very urgent and less urgent. We could provide an exceedingly rapid and consequently expensive service which, while suitable for the very urgent telegrams, would give to the more numerous but less urgent messages quicker treatment than is necessary; or by exercising greater economy we could base our standard on the requirements of the less important messages, to the detriment of those of a really urgent nature. But neither of these plans would meet the whole requirements. The ideal arrangement would be that under which each type of telegram received the treatment, neither better nor worse than its urgency demanded. Obviously the responsibility of discriminating could not be undertaken by the Department, and the solution seems to be to introduce a higher charge for the more urgent traffic. Normal transit times of, say, 30 minutes and 90 minutes, respectively, for the two classes of traffic could be adopted. Much could be said in favour of a change in this direction, but the chief advantage would be that more effective arrangements could be made for the expeditious handling of the very urgent traffic, whilst the remaining work could be disposed of with greater regard for economy by reason of increased allowable delay.

The history of the Telegraph Service since 1870 has been one long story of endeavour, the object always being the improvement of the service. During the past twenty years the struggle has steadily become more intense until now the culminating point seems almost to have been reached. The progress in the direction of improved apparatus and methods of working during recent years has been almost startling in its rapidity, and a complete transfer from Morse to modern systems of working has been effected on the whole of the main lines, and on a great number of the less important routes. Theoretically, the newer systems of telegraphy, with their much more complicated and costly apparatus and their increased running costs, should have produced results far in advance of the simpler and older methods, but, in practice, although we can discern a certain increase in output, complete efficiency remains to be attained. In view of the extent and rapidity of the changes, this may not be altogether surprising, but the time seems to have arrived when we should "take stock," for it is apparent that during the last few years we have, as it were, been fighting a running battle, continually advancing without yet having had the opportunity of consolidating our gains.

It goes without saying that the quality of the service depends largely upon the efficacy of the apparatus and the capacity of the operators to get the best out of it. One of the chief present-day deterrents against satisfactory operator output is the instability of modern apparatus. Nowadays interruptions are much more serious than they were hitherto, on account of the greater carrying capacity of individual circuits; and only responsible supervising officers who have experienced the effect of stoppages on busy modern circuits during pressure periods can fully realise the desirability of improvement in this respect. The attendant congestion and dislocation are not restricted to the actual time of interruption, but begin with the onset of the trouble and end only when the "clearing up" process is complete. True, much has been done to improve the stability of modern circuits by Headquarters in conjunction with the Engineering Department, but more remains to be done, and we cannot afford to relax our efforts until Multiplex and Teleprinter apparatus is freed from this disadvantage and stoppages are the rare exception rather than the daily occurrence. So far as the Engineering Department is concerned, the objective seems to be to ensure that there be no weakness in the design and construction of the apparatus or in its installation and maintenance; and always to be alive to the possibility of simplification and improvement. The Engineers are fully aware of their responsibilities and we confidently leave this side of the matter in their hands.

Divided Baudot circuits, of which there is a goodly proportion, increase the difficulties arising from instability, inasmuch as an interruption on either side of the intermediate office affects two main channels. The absence of direct touch between the dirigeurs at the terminal offices, who are dependent upon the intermediate dirigeur for prompt attention and co-operation, seriously detracts from the efficiency of these circuits. The interposing of the third party cannot but produce results much less satisfactory than those obtainable on straight circuits. Three station circuits are, of course, "materially" economical, but by their greater liability to interruption they forfeit this advantage. Wherever practicable, then, the replacement of divided circuits by direct Teleprinters is advocated as a necessary step in the direction of improved stability.

We cannot leave this part of the subject without referring to the great need of dirigeur efficiency, which is so essential to Multiplex stability. By prompt and accurate diagnosis, a really efficient dirigeur is able to reduce interruptions to a minimum; and full co-operation between dirigeur and supervisor is an invaluable factor in the expeditious disposal of traffic. It is of the highest importance, therefore, that the dirigeur should be an officer possessing special qualifications. In the past there may have been a tendency to lean in the direction of seniority in selecting dirigeurs, and no discredit is implied by the admission that this has not always had the best results. But if we are to reach the highest degree of efficiency in autoplex and multiplex working, the first consideration in the selection of a dirigeur must be his personal and technical qualification for the job, and the officer possessing these qualifications in the greatest degree should be chosen whether he be senior or not. His training in dirigeur duties should be thorough, and it would undoubtedly be beneficial if a system of central training were set up, say in London and several other large centres, and tuition were given on definite and standard lines, abreast with modern developments. The instructors chosen would need to be specially qualified and suitable men working in close touch not only with each other, but also with the Engineering Department and the Traffic Section.

The employment of dirigeurs as dirigeur-operators, under any circumstances, is, in my view, open to objection. When a dirigeur is so employed he cannot concentrate, either as dirigeur or operator, and one part of his duty must suffer. Moreover, it frequently happens that a dirigeur-operator (supposed to carry only three quarters of a full load) is working to an operator from whom full output is expected. The disadvantage of this arrangement is obvious. For these reasons I suggest the abandonment of this system, and, instead, I would give the dirigeur the oversight of more than one circuit during the less busy hours.

To secure the uninterrupted running of Teleprinter circuits, at which dirigeurs are not employed, the general testing arrangements of an office should provide for each such circuit to be rigorously tested under working conditions every morning before actual

working commences. The tests should be conducted by officers of the Commercial and Engineering Staffs at both ends of the circuit—working in conjunction. Rigid adherence to such a practice would reduce to a minimum stoppages of a serious nature, i.e. those which could not be dealt with by the operators themselves, assuming, of course, that the operators were properly trained in and thoroughly conversant with the making of simple adjustments.

Primarily, then, my plea is for more efficient and stable working conditions, but can it be said that this meets the whole trouble? I am afraid not. Certainly, as has already been indicated, the development from Morse to machine telegraphy has been extremely rapid, and, bearing in mind that a wholesale change of apparatus has entailed a concurrent adoption of entirely new methods, we need not be discouraged if we have not yet attained the standard of operating efficiency we all aim at. Also, the factors of age and long familiarity with less rapid methods are important, and must not be under estimated, but we must try to realise that modern apparatus involves a new conception of values.

Although telegraph operating has become less personal and more mechanical in character, it still calls for a high degree of skill and specialised knowledge, and we must not, indeed we cannot, expect satisfactory results from the new and costly keyboard apparatus until our operators, fully competent in all other directions, have become highly skilled touch typists. Unfortunately, we have a considerable amount of leeway to make up in this respect, but once the staff realises the need and is given the opportunity of remedying the weakness, there will be a ready response on their part. Without going into detail, it seems evident that, until comparatively recently, there has not been sufficient insistence upon this most important factor. To this I would add that widespread misconception of the true purpose of the staffing standards has hindered progress towards full efficiency. By this I mean that when the Telegraphing Staffing Standards were first discussed, there were many who immediately concluded, and who still think, that the figures given were standards of output or rates of working. This, of course, is not the case. The figures are intended to furnish telegraph officials with a standard upon which to provide staff. The setting-up of standards applicable to all offices must be credited to the Department as a very wise and businesslike move, whether we agree with the actual figures or not. So far as individual output is concerned, the figures have no value. At times of pressure, the Staffing Standards will be exceeded, and at quiet times they will not be reached.

Again, the very early stage at which training in touch typing is discontinued (ability to type 25 telegrams in half an hour), gives a false impression as to the value of keyboard operation. We discontinue training when a speed equivalent to approximately 17 words per minute is reached, and with these meagre qualifications an officer has to attempt to deal with live traffic at a circuit with a speed up to 40 words a minute. This is clearly unsatisfactory, as it is more than likely that the newly trained officer will be employed at a circuit staffed on a basis considerably in excess of his maximum capacity. It is true, of course, that his speed soon improves, but my experience leads me to suggest that as soon as he reaches the point at which he is able to transmit the standard load, further progress is slow, and, in the end, there results a mediocre state of efficiency, beyond which there is in most cases no inclination to proceed. I would urge, therefore, that the period of training be extended until the trainee reaches a speed of, say, 35 telegrams in half an hour. Afterwards the further practice would be with live traffic, but periodical tests in the school would be continued until a speed of 50 telegrams in half an hour was reached, when a certificate of full efficiency could be given. It is conceivable, of course, that a proportion of the present staff would not be able to qualify for such a certificate, but in these cases there would probably be other work for them to do. The more complete training provided under this proposal would be beneficial to the operator inasmuch as he would realise that he was able to turn out the best work, both in quality and quantity, without taxing his energies, and the improvement in the Service could not fail to be considerable. The point to be stressed here is that, although there is a plea for increased output, it is not suggested that this should be achieved by greater exertion on the part of the operator, but rather by considerably increasing his skill in touch typing and enabling him to perform his work with much greater ease.

Any efforts towards increased efficiency on the lines indicated would be nullified if they were not applied generally. Thus it would be necessary for the process to extend throughout the whole Service from the Central Telegraph Office downwards.

It would indeed appear that no radical improvement could be hoped for if the Central Telegraph Office, by far the largest and most important unit, did not assume its rightful place in the van of the movement. The enormous difficulties inherent in that huge organisation may seem to render the task well-nigh hopeless, but with goodwill and determination on all sides, success can be achieved. With the Central Telegraph Office leading the way, we shall not find the Provinces lacking, and I predict as the result a happier and more efficient service than has yet been attained.

MOVING TRAINS AND TELEGRAPHY, TELEPHONY, AND TELEVISION.

THE general public have become accustomed to the fact that aeroplanes are able to communicate with one another and with land stations either by Morse telegraphy or the telephone. Thus no one of the non-technical press has apparently taken note of the experimental and successful conversation held between an aeroplane flying at 95 m.p.h. 2,500 ft. above a township in New Jersey and the laboratory of the Bell Telephone Company outside New York.

Strange to say, however, that in some quarters surprise is now expressed at the possibilities of similar and even more extended communication between moving trains and stationary buildings such as telephone exchanges and telegraph offices, &c.

Two or three years nowadays is a considerable period in the history of scientific development, and it is therefore instructive to recall that in August, 1925, the German wireless periodical *Die Antenne* published an interesting and somewhat detailed article on experiments which had by that time shown every sign of success, and if my memory serves me correctly even gave photographs of the railway carriages fitted with receiving roof aerials. Certainly in December of the same year the *Deutsche Reichspostamtsblatt* (the equivalent of our P.O. Circular) contained the first instructions regarding the acceptance of telegrams "on certain moving trains not only for Germany but for all foreign countries." In October of the following year the L.N.E.R., using the "carrier current," made certain experiments between one of their expresses on the section Potters Bar and Peterborough, the coupling aerial being stretched along the length of two carriages. From the details, which it is not necessary to particularise for the purposes of this article, it was evident that the system had direct relationship to that used by the German Government, or rather by the private company licensed by the Reichspostamt.

These conditions, by the way, were specially precise, not to say exacting, nevertheless the company took up the service, and by improving its technical side and developing the commercial aspects, has held on until now.

The first service was that given to 10 trains per day, i.e., five each way between Berlin and Hamburg, roughly 200 miles, and provided three telephonic traffic circuits and unrestricted telegraph traffic. This demanded no less than eight wavelengths. The fixed stations which dealt with the transmission and switching were :—

(1) Spandau (Berlin.) (2) Wittenberg. (3) Bergedorf (Hamburg.)

Thus speech was possible with any one of these three stations, a few local extensions at the two termini, which were also able to give certain extensions, while trunk calls were made through the Trunk Exchange at Wittenberg. Thus simultaneously speech

could be had from the same train by three callers, one each to Wittenberg and the two termini respectively. In addition one circuit was always available for telegraph traffic, the Government having preferential use of the same.

The system was to be extended to Munich and other centres later, and this appears to have been done judging from the continued success of the system.

Le Bulletin Mensuel some little time ago mentioned certain telephonic communication tests on the Paris-Bordeaux express. On this occasion facilities were afforded for 60 listeners. The result then reported was, that the experiment had been a real success except when the train was travelling over electrified sections of the route. Whether these last-mentioned difficulties were purely local did not emerge, and whether they have since been surmounted there is no published record so far as the writer's data serves him.

At any rate, what appears to be the satisfactory sequel to this interesting railway run is the recent announcement from Paris that a company has been formed entitled the *Radio-Fen Société pour la radiophonie dans les gares et sur les reseaux de chemins de Fer*, with a capital of 100,000 francs, to install radio receivers at the railway stations and on passenger trains in France. The objects are in principle the same, though not identical with the system as at present exploited in Germany. The company just mentioned is known to be working in conjunction with a Hungarian company, which latter organisation, it is understood, has not a little to do with the installations in use on German trains.

Following close upon these facts, and probably for some time being worked out on parallel lines, come the Canadian National Railway experiments, which have also proved successful. To quote *The Times Engineering Supplement* of May 25: "On a demonstration trip a telephone conversation was carried on between passengers on a train travelling at 50 miles per hour and a Canadian National Railway official at his desk in Toronto." A further trial was made when Mr. W. D. Robb, vice-president of the T. and T. department of the C.N.R., spoke over the telephone from a fast-moving train his speech being transmitted from aerials on the roof of the carriage, the railway telegraph lines conveying the speech, which was also received by a broadcasting station, repeated on another wavelength, and picked up by the receiving apparatus of the moving train from which Mr. Robb was speaking, and of course was likewise heard by many of the ordinary listeners-in.

Reuter's Ottawa agency adds that "the new process eliminated many of the difficulties now experienced with similar voice-transmission by the system operating in Germany."

It may be mentioned that Mr. W. G. Barber, General Manager of the C.N.R., was also associated with the trials which it is now proposed to follow up by "the actual installation of wireless telephone equipment on a number of C.N.R. trains to enable passengers to keep in constant touch with their homes or business offices."

It is fully worthy of note that one pair of the telephone wires which ran by the side of the Canadian railway track was itself carrying ten telegraph messages simultaneously, and yet there was no sign of *interference*, so perfectly had the voice-frequency system been adjusted.

To telephone to home or office while rushing at 50 m.p.h. across Canada, yet sitting in the most comfortable of arm-chairs —which, *inter alia*, can be changed into a fully-equipped wash-basins at will—what could be more typical of modern scientific developments and human ingenuity?

Do we wish to add a dancing-room to the Pullman trains, as has been inaugurated in the U.S.A.? Heaven forfend!

However, television will follow without doubt, for were not pictures of the Derby successfully transmitted on the day of the race by means of the Fultograph process to the "up" Scotsman as it rushed between York and Grantham and the "down" raced through Northumberland?

J. J. T.

INTENSIVE CANVASSING.

A BACKWARD canvassing area may be defined as an area in which the rate at which orders are being obtained is not commensurate with the development forecast figures on which exchange and line plant have been provided. Intensive canvassing may be defined as the introduction into a backward canvassing area of a number of additional Contract Officers in such a way that the area is divided up into so many parts, one part being given to the Contract Officer normally responsible for the whole area and the remaining parts being given to the assisting squad. During the period of the intensive canvass each Contract Officer to whom a portion of the backward area has been allotted is responsible, and alone responsible, for all the canvassing in his portion. He deals with written applications and all the unsuccessful interview cards affecting that portion.

It is this well-defined division of a backward area into separate parts which marks the difference between intensive canvassing and squad canvassing. Squad canvassing also meant the temporary introduction of a squad of Contract Officers into an area where it was desired to stimulate development, but it had the feature that, as the Contract Officer responsible for the area was left on his ground, there resulted overlapping and duplication of effort between him and the squad. Intensive canvassing overcomes this objection in a simple and effective way.

During the period of attack, intensive canvassing, except in very exceptional cases, will not increase or even maintain the average number of orders obtained per man in the area dealt with. If, for instance, a Contract Officer whose district came under intensive canvassing had been obtaining orders at the rate of 10 exchange lines per week, and an intensive canvassing squad of 2 men were appointed to his district, I would not expect 30 exchange lines per week to be obtained from the combined forces of 3 men. There are three reasons why the number would fall short of that figure:—

(1) In London applications, written and verbal, are the source from which the majority of orders are obtained. These applications will not increase because of the appointment of additional men on a Contract Officer's ground. If the ten orders per week obtained by the Contract Officer were made up of three from pure canvassing and seven from applications, and a squad of two men were appointed to his area, the pure canvassing figure of three orders should, roughly, be trebled, making a figure of nine orders in all, but the applications figure of seven would remain constant. The total figure would, therefore, not be 30, but 9 + 7, or 16. To this figure, however, something would require to be added owing to the fact that the applications would, during the period of intensive canvass, be divided amongst three men, and each man would have more time to devote to pure canvassing than the original Contract Officer who took all the applications. In London three-fifths of a Contract Officer's time are devoted to applications and two-fifths to pure canvassing, and the total figure to be added to the pure canvassing figure, due to the fact mentioned, works out at nine, making the total orders from pure canvassing 18, or six per man. This figure of 18, added to the applications figure of 7, which remains constant, gives us a total of 25 orders in all from the area.

(2) The second reason, although it applies to London, need not necessarily apply elsewhere. When we started this scheme of intensive canvassing in London it was found convenient to employ new and not experienced Contract Officers on the work. It was convenient for two reasons, first, because the withdrawal of experienced men from their areas would have prejudicially affected for the time being the number of orders obtained from such areas, and secondly, because we do not care to give newly trained men much paper work, and under intensive canvassing a man has less paper work than if working an area under normal conditions. Although, however, the appointment of newly trained men to the work meant that the scheme was inaugurated with the minimum

amount of dislocation to existing conditions, it meant also that we did not get quite such good results as with experienced men. A Contract Officer in his first year obtains results equivalent to 80% of the results of an experienced man. The application of this factor to the case of the area quoted above means that each of the two men forming the assisting squad, instead of getting 6 orders by pure canvassing, would get four and four-fifths, or, say, 9½ between them, and this, added to the results obtained by the experienced man already in the area, which would remain at 6 as before, gives a total of 15½ for all three men from pure canvassing. In other words, the total orders from the area would be reduced from 25 to 22½.

(3) Thirdly, there is the point that a Contract Officer on a diversified area, an area where the class of property varies, as, after all, it does in every canvassing area, is in a position to choose districts to which to give his attention. Naturally, he devotes his time primarily to those portions of the area from which he expects good results. If his area is cut down by two-thirds, he is not in such a good position to choose. He is forced—and his temporary assistants are forced—to give attention to less productive parts, to canvass streets and roads and premises from which orders for telephones are not readily obtained. It is right, therefore, to reduce, because of the fact that less profitable districts have to be tapped, the figure of 22½ mentioned under (2). The figure of reduction would, of course, vary according to the area shown for intensive canvassing. In London a figure of 20% was applied as an average reducing figure consequent on this factor. The application of this percentage to the case taken as an illustration brings the figure of 22½ to 18, or 6 per man from all sources—applications and pure canvassing.

I mentioned at a recent meeting of District Managers that we were giving a trial to intensive canvassing in the four Contract Districts into which the London Telephone Area was divided. The trial has now been completed. The scheme was applied in all to 16 backward canvassing areas. It fitted in smoothly with our normal canvassing arrangements, and resulted in every case in additional subscribers being obtained in districts where we had superfluous plant, and to that extent may be said to have been successful. The actual figures of orders obtained were not, however, impressive. The results in one or two of the areas treated at the inception of the scheme, i.e., towards the end of 1928, were quite good. Subsequent results were disappointing, and in the majority of cases the figure of 6 per man was not attained. The later results cannot, of course, be put down to any inherent defect in the scheme, but must simply be attributed to the fact that, in the early part of 1929, partly because of trade conditions and partly because of the shadow of the General Election, orders were difficult to obtain. A General Election has invariably a detrimental effect on telephone business. The feeling of uncertainty creates an atmosphere calculated to check business, and there is a general tendency among business people to postpone decisions on such matters as can conveniently be put aside, telephones being one of them, until the country has decided on politics.

It is obvious that, in scrutinising the results of an intensive canvass, no comparison can properly be made with the figures of orders obtained during some period when the area was under normal canvassing. The circumstances obtaining during each such two periods vary so considerably that comparison between them would lead to fallacious results. District Managers who may consider that some such scheme would be beneficial in areas where the results are falling short of the forecasted figures will probably have to arrive at a figure per man, as was done in London, and decide on the basis of that figure whether, during the period of intensive canvass, the results have been satisfactory, or otherwise. A comparison could, however, and should, in my view, be set up for a period *following the intensive canvass* and the corresponding period of the previous year. The intensive canvass, besides bringing in an increased total of orders during its application in selected areas, should reasonably be expected to give an impetus to the rate at which orders will be obtained when the intensive squad is withdrawn. The increased publicity given in a neighbourhood during the four or five weeks of intensive canvass should help the flow of applications and should tend to make subsequent canvassing easier and more profitable, and, in addition, a heritage of unsuccessful interview cards, that is, cards containing the names and addresses of probable subscribers, will have been bequeathed by the intensive canvassing squad to the man left on the ground.

Intensive canvassing is not, of course, the remedy to apply to a permanently backward area. The fact that, over a long period, the results obtained have fallen short of the orders anticipated by the development forecasts indicates that the man on the ground needs permanent assistance. Intensive canvassing is intended to apply to temporarily backward areas, areas where the canvassing force is normally sufficient for the ground, but where the rate at which orders are being obtained has fallen for the moment so far behind the position with regard to Exchange and line plant provision that a special impetus is necessary to restore the balance.

C. W. MUIRHEAD.

KEW GARDENS AGAIN !

THE ninth summer reunion of former C.T.O. colleagues was celebrated at the usual rendezvous of the Imperial Restaurant, Kew. On this occasion, the 12th ult., there was a record attendance of 160 ladies and gentlemen, the function being unanimously voted a most successful meeting, the weather materially aiding in this result.

Expressions of regret were received from several persons who were prevented from attending due to absence from London, annual leave (*sic.*), and unfortunately in some cases failing health. Particularly was this the case with the much beloved Adam Gordon, whose condition was reported as very serious.

The deep interest taken in these gatherings was emphasised by the presence of members from Clacton, Worthing, Brighton, Westcliffe, &c., &c., and included Mr. C. Honeysett, late Postmaster of Henley, who with Mr. Joe Murray, came up specially from Torquay, Mr. J. Hopgood from Bournemouth, Mr. J. Thomas late Postmaster of March (Cambs.), who left the wilds of Chippenham for a few hours, even "The Archbishop," Mr. J. W. Twyman, tearing himself away from the lure of the cloistered Pantiles of Tun. Wells !

Reference to the passing over of Miss E. F. Greer is more appropriately made elsewhere.

REVIEWS.

THE Automatic Telephone Manufacturing Co., Ltd., Liverpool, have published "The A.T.M. Telegraph Engineers' Handbook" at the very moderate price of 2*s.* 6*d.*

The little volume should prove a useful companion to telegraph engineers and others interested in the technical side of telegraphy. The chapter on Telegraph Transmission on Overhead Circuits is an interesting one, due credit being accorded to Mr. Lawton, of the Indian Government Telegraphs, whose Official Technical Instructions the A.T.M. affirms "deserve to be better known."

The chapter on "Transients" requires considerable mathematical knowledge, but are not outside the normal engineer's ken. The Gulstad relay and the Vyle polarised sounder are very ably dealt with. The book is admittedly specially written for the guidance of existing users of A.T.M. telegraph apparatus, but all the matter, except the last 15 of its 115 pages, is of universal interest to telegraph engineers.

J. J. T.

TELEPHONE SERVICE IN THE HOME COUNTIES.

THERE is probably no change in telephone service more striking to, and more appreciated by, the average subscriber than the conversion of a route he uses frequently from "delay" to "demand" working. For the process of booking a call and waiting for it to mature during an indeterminate period (which always seems much longer than it really is, and during which the caller feels tied to the vicinity of the telephone) there is substituted the smooth and easy method of demand, followed, in normal circumstances within a matter of seconds, by the reply of the desired party. Such a service without limit of distance must, in fact, represent the ideal telephone service—an ideal, unfortunately, unattainable over great distances without prohibitive cost, solely on account of the tendency of the demand to "bunch" into the busy business hours. Were it not for this tendency, that is, were the rate of demand absolutely even throughout the day, all services might, in fact, be on a "demand" basis. Since it would be clearly uneconomical to provide very long circuits to meet the maximum load, which is maintained over a short period only in each day, some measure of "lining up" demands, that is, artificially levelling-out the rate of demand, with consequent delays, becomes necessary during the busiest hours.

This condition has led to a sharp division of trunk routes into "delay" routes, worked from a trunk exchange or trunk positions in a local exchange, and "no delay" routes worked from local positions.

It will be clear, however, that, except in the peak hours, even the "delay" routes could carry the traffic on a "demand" basis, and some years ago a system of operating, called "Special Control Working," was evolved in an endeavour to secure the best of both worlds in this matter; that is, while avoiding the lavish expenditure which would be necessary to give a "demand" service at the period of maximum pressure, to secure for subscribers the benefit of a "no-delay" service during those hours when the demand was within the carrying capacity of the routes concerned. Under this system the circuits concerned are multipled over the local "A" and "B" positions, as well as over the position to be used as a trunk operating position for the route concerned in the busy hours. An operator receiving a demand involving any route liable to "Special Control" is able thus to complete the call on a "demand" basis whenever the traffic conditions on the route permit. If, however, at any time the rate of demand for any group exceeds the carrying capacity of the group, "Special Control" is brought into force.

The first jack on the group concerned is then pegged, with a peg indicating "Special Control," on every multiple except that serving the Special Control position. Under these conditions calls involving the route in question are ticketed at the "A" positions and the tickets passed to the Special Control position, where the route is worked under normal "delay" conditions. Calls originated at sub-exchanges involving routes liable to Special Control are controlled at the exchange of origin under normal conditions, passing through the "B" positions at the main exchange in the ordinary way. When a route is put under Special Control, however, the B operator at the main exchange is directed by the peg in her multiple repetition of the route concerned to divert the demand to a record position, where a ticket is prepared and passed to the Special Control position, whence the call is reversed and controlled. Except in cases of junctions engaged, number engaged or no reply, the sub-exchange thus either secures connexion on demand, or has the call taken over by the main exchange, and is relieved of further responsibility.

A special advantage of the system is that "delay" working need only be instituted when the traffic conditions actually demand such a course, and it is thus independent of any pre-arranged time table. By these means connexion is given to the subscriber on demand during all times that the traffic conditions actually existing at the moment permit, and only under the usual "delay" conditions when the rate of demand exceeds the capacity of the group.

For a number of reasons the development of this system of working has not been rapid, but the way has recently opened for expansion on these lines, and the London Special Control System is the first result.

The problem of serving the outer suburban area of London and the country immediately beyond—commonly known as the Home Counties—has presented special problems with the rapid growth of London itself. The "dormitory" towns have always expected a no-delay service to the city area, and vice versa, and this condition was, no doubt, met sufficiently well when the limits of the original "London Telephone Area," which represented the no-delay area of its day, were determined many years ago (1896). With the continual growth of London itself, however, and the increasing tendency for city people to live further and further from the centre, this area became too restricted, and the London Toll area was created in 1921. This development represented a very great advance in telephone facilities, and brought within the London no-delay area many places 30, 40, and even 50 miles distant from the centre.

Such, however, has been the growth of the residential and business area of London that even this extension hardly meets present-day conditions. Yet to extend the Toll area still further would be an expensive proposition, since the additional circuits necessary would be in use for but a short period each day, the existing lines being adequate for the traffic outside the peak hours. These conflicting considerations offered an ideal opportunity for the application of the "Special Control" system of working, and the change over to this method within the wide area shown on the map above has, therefore, been made.

The effect of the change is to give a "demand" service outside the hours of peak traffic from every subscriber in the Special Control area, shown on the map, to every other in that area. No less than 45% of the total number of subscribers in the country are situated in this area, and are directly affected by the change, while incoming long distance calls from outside the area to places in the new Special Control area also secure more speedy connexion. Calls between places as far distant as Folkestone and Bedford, or as Lyndhurst in Hampshire and Diss in Norfolk, can now at almost all times be obtained on demand, but such through traffic is small by comparison with the traffic from the provincial exchanges concerned to the London central area, and it is in respect of this latter class of calls that the principal benefit will be felt.

The change over has been effected with a remarkable absence of difficulties, and may legitimately be regarded as a distinct step forward in telephone progress in this country.

W. C. G.

OBITUARY: THE LATE MISS E. F. GREER.

WE regret to record the passing away of yet another link with the Old Brigade of the C.T.O., by the death, after a long illness, at an advanced age, of Miss E. F. Greer, which took place at Worthing, at the end of May. Entering the old Electric & International Telegraph Company in 1863, the late Miss Greer transferred to the Post Office service in 1870, and came to the present C.T.O. in 1874, where for many years she took duty under her sister, the late Miss M. H. Greer, in the Scottish and other divisions, and later in the Matron's Office, of which her sister became the Chief. Of a somewhat delicate state of health, the deceased lady was unable to accept promotion to supervising rank and retired as a First-Class Telegraphist at the close of 1900. She was a most devoted companion to her sister, who predeceased her in 1925. To Miss A. E. Hale, her niece, and her other relatives, we tender our sincerest sympathy.

C. S. K.

TELEGRAPHIC MEMORABILIA.

THE very interesting "forecast" of Mr. Lowe in last month's issue, by a fortunate coincidence appeared at the same time as an article on "Picture Telegraphy" by another writer.

Mr. Lowe's suggestion of "a code of signs or symbols" each sign or symbol to represent, say a ten-letter code-word in one of the several universal code-books, is, of course, not an impossibility, although it savours somewhat of the Chinese system—turned the other way round!

Mr. Lowe understands that "the efficiency of word-transmission" by a facsimile process, is *greatly* impaired by the *least suspicion* of line or circuit interruption, but the words italicised express relative values which would probably differ with each individual who adjudicated.

Our Editor's foot-note to the very ingenious suggestion of Mr. Lowe, that a form of shorthand might assist in the more economical transmission of telegrams by means of telephotography, again depends upon the degree to which "the least suspicion of line or circuit interruption" actually proves detrimental to accurate reception.

Thanks to the courtesy of Dr. Lüschen of Siemenstadtwerke, I am able to present the following two figures, I and II, which respectively represent photographs, one of an original test-telegram

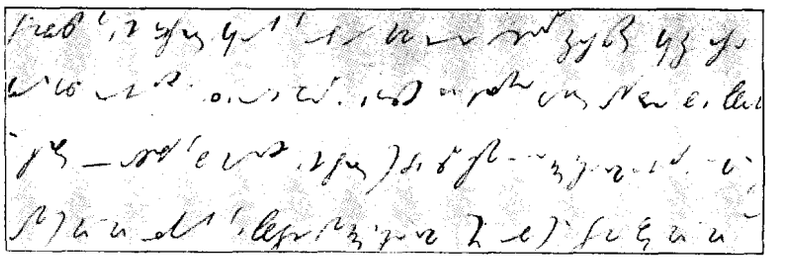


FIG. 1.

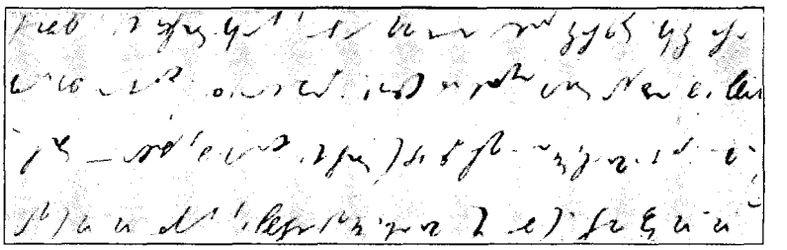


FIG. 2.

written in German shorthand taken prior to transmission over an underground telegraph circuit of about 250 miles, and the other that of the copy so received at the distant office by means of a telephotographic system.

It is reasonable to presume that if very slight interferences are likely to bring about serious distortion, shorthand would scarcely be the best medium for accelerating transmission and reducing the cost thereof. I am of opinion, however, that the systems are becoming more and more stabilised, although like all other telegraph systems they are naturally subject to "interference," at least occasionally. My space is filling up with this interesting subject and for the present I must leave it.

There is plenty of activity in the direction of Radio communication. In Europe, where a regular wireless service has been opened between Bulgaria and Great Britain, and where Spain is establishing, if she has not already established, a short-wave station at Aranjuez, in order, so it is said, to have direct communication with South America, free from London and Paris.

A short-wave transmitter has been erected at Funchal on 47 metres for broadcasting purposes, and the Congress of Costa Rica has authorised the construction of three additional receiving stations, one in Liberia, another in the Canton of San Carlos, and the third in the province of Puntarenas.

Fernando Po also, although its geographical position is not very favourable, being so near the Equator, is to have a direct wireless service with Madrid. It is said that although the position as regards long-wave transmission is unfavourable, short-wave signals are well received from Europe.

Inter alia a medium-wave valve transmitter and receiver are to replace the present medium-wave spark station in the Colony for ship-to-shore and neighbouring colonies service.

A radio-telegraph service was also inaugurated between England and Siam at the beginning of last month.

In connexion with the Peruvian services the International Telephone and Telegraph Corporation, via All-America Cables Incorporated, has secured permission to establish wireless, telephone, and telegraph stations in Peru for point-to-point and international communication.

There is one very definite sign of the times in the fact that while the concession to the company is renewed for establishing submarine cables for international telephone transmission in addition to its present telegraph services, there is an additional binding clause which lays down the condition, *that all present and future lines must be capable of carrying both telephone and telegraph communication independently or simultaneously.*

The significance of the italicised clause above has no doubt already been noted by every responsible and alert telegraph engineer.

It is with more than ordinary interest, in view of the prominence given to the Baird system of Television in these columns, that one notes the following information supplied by the special Berlin correspondent of the *Daily Telegraph* :—

" . . . a large and powerful combination has been formed to work the Baird system of television in Germany.

" In addition to the English Baird Television Company partners in this firm will be : the Zeiss Works, which will supply the optical elements of the installations ; Bosch Stuttgart, who will make the necessary motors ; and Loewer Radio, specialists in wireless equipment."

J. J. T.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at April 30, 1929, was 1,762,624, representing an increase of 7,983 on the total at the end of the previous month.

The growth for the month is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at April 30	630,481	1,132,143
Net increase for month	3,767	4,216
Residence Rate Subscribers—		
Total	151,549	238,235
Net increase	1,456	1,577
Call Office Stations (including Kiosks)—		
Total	5,587	20,353
Net increase	—	88
Kiosks—		
Total	1,287	5,098
Net increase	14	93
Rural Party Line Stations—		
Total	—	10,442
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	17	1,111
Net increase	—	22

The total number of inland trunk calls originated during the year ended Mar. 31, 1929, was 109,554,447, representing an increase of 7,347,851, or 7.19% over the total for the previous year. Outgoing international calls for the year numbered 452,816, and incoming international calls 490,169, the increase over the total for the year 1927-28 being 113,196 (33%) and 127,817 (35%) respectively.

Further progress was made during the month of May with the development of the local exchange system. New exchanges opened included the following :—

PROVINCES—Durham, Aldridge, Bloxwich, Walsall (automatic), Broughton (Northants), Church Stoke, Clifton (Beds), Howick (Long Houghton), Quainton, Marbury, Walkern, West Cranmore, Weston (Beds) (rural automatic),

and among the more important exchanges extended were :—

PROVINCES—Glasgow (South), Todmorden, Wednesbury, Woking.

During the month the following additions to the main underground system were completed and brought into use :—

Castleford—Knottingley cable,

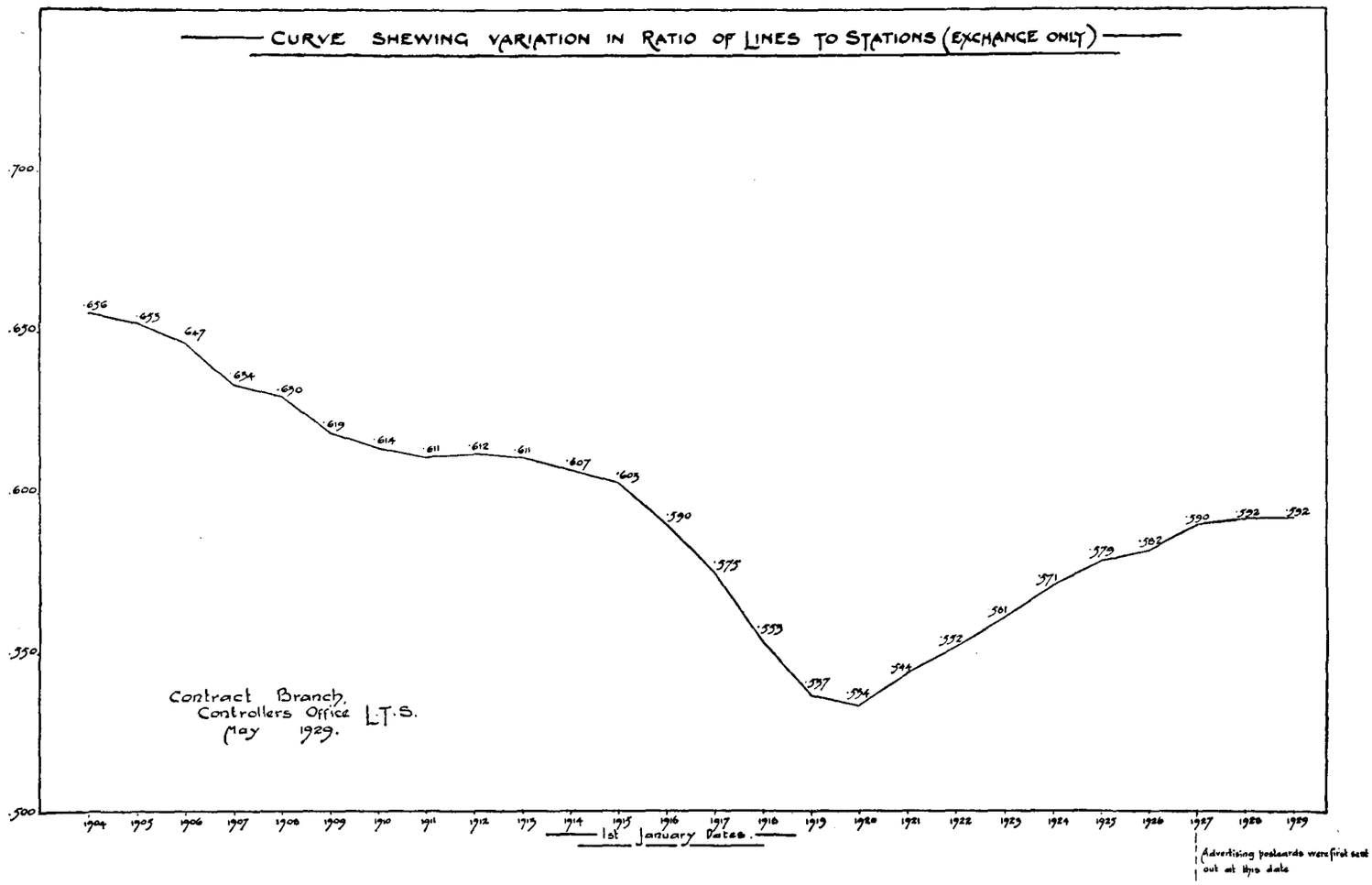
while 77 new overhead trunk circuits were completed, and 86 additional circuits were provided by means of spare wires in underground cables.

RATIO OF LINES TO STATIONS.

THAT there is a field for investigation into methods and results on the commercial as well as on the technical and traffic sides of the telephone business, no one who has thought seriously about the subject will deny. The best-known scheme of investigation on the commercial side is, perhaps, the Development study, with which most readers will be more or less familiar. There are lesser forms of inquiry, however, which will repay a little trouble in digging out the facts and give, besides, to all who may be interested, a wider outlook on the telephone art.

One such investigation in which we in London have recently been particularly interested is the ratio of exchange lines to stations. Someone may say " not a very fruitful field to dig in, surely," but a glance at the chart appended will perhaps cause a change of mind on this point.

Let us examine the position for a moment. Away back in 1904, which is as far back as our available records go, there was for every telephone station .656 of an exchange line. To put it more plainly, for the benefit of those who, like a certain famous statesman, cannot fathom the mystery of " these damned dots," for every 1,000 stations there were 656 exchange lines. There was evidently need, therefore, for a campaign to increase extensions and private branch exchanges. This was put in hand, and one can follow on the chart the success which was attained. Orders for large private branch exchanges in hotels and stores were obtained and the value of telephone service on a large scale can be said to have been first appreciated in this period.



There was a slight set-back at the time of the transfer of the National Telephone Company's system to the State, and then the satisfactory downward progress was resumed.

Then came the war, and the advent of large Government private branch exchanges made the ratio plunge headlong, but the bottom was only reached in the year following the war, although the downward progress during that year was much less steep.

Then began the closing down of war-time departments, with their large private branch exchanges. Orders for others of equal importance not being obtainable the curve started to mount, and in 1926 it was considered that some drastic steps would have to be taken to bring the upward tendency to a stop. This it was appreciated was quite a formidable task owing, among other things, to the large percentage of orders for exchange lines only obtained from medium-sized houses where, in the present state of the telephone habit here, extensions were unlikely to be ordered to any appreciable extent.

Many ideas were considered, and ultimately they were reduced to three main points :—

(*a*) More intensive pressure for extensions by contract officers.

(*b*) Advertising by means of " return " postcards, through the medium of the quarterly accounts.

(*c*) " Return " postcards to be distributed freely by contract officers and with suitable correspondence.

All these methods and some others of bringing the advantages of extensions before subscribers were adopted, and have been kept up ever since with a break here and there in the sequence of postcards sent out with accounts owing to the distribution of some special circular on other matter.

On one or more occasions a special circular and the postcard went out together without making any appreciable difference to the number of orders obtained.

At first, postcards were only sent with accounts to residential subscribers having a direct line only, but latterly the scheme was extended to business rate subscribers without extensions with equally good results.

It is no secret that the first postcard sent out to residential subscribers produced over 700 extensions. A reservoir was evidently there waiting to be tapped and the first attempt was a proved success. No other card has produced such good results, but the returns are nevertheless extremely gratifying, and this method of advertising now appears to have become a useful habit.

Constant pressure on contract officers to obtain more extensions, either single ones or better still in groups, has also had its effect, and there has been a considerable improvement in this respect, but there is still room for betterment here, as otherwise each postcard issued would not produce its goodly crop of orders.

The result of all this will be seen by examining the chart, where it will be noticed that the upward tendency was practically stopped in 1927 and wholly stopped in 1928.

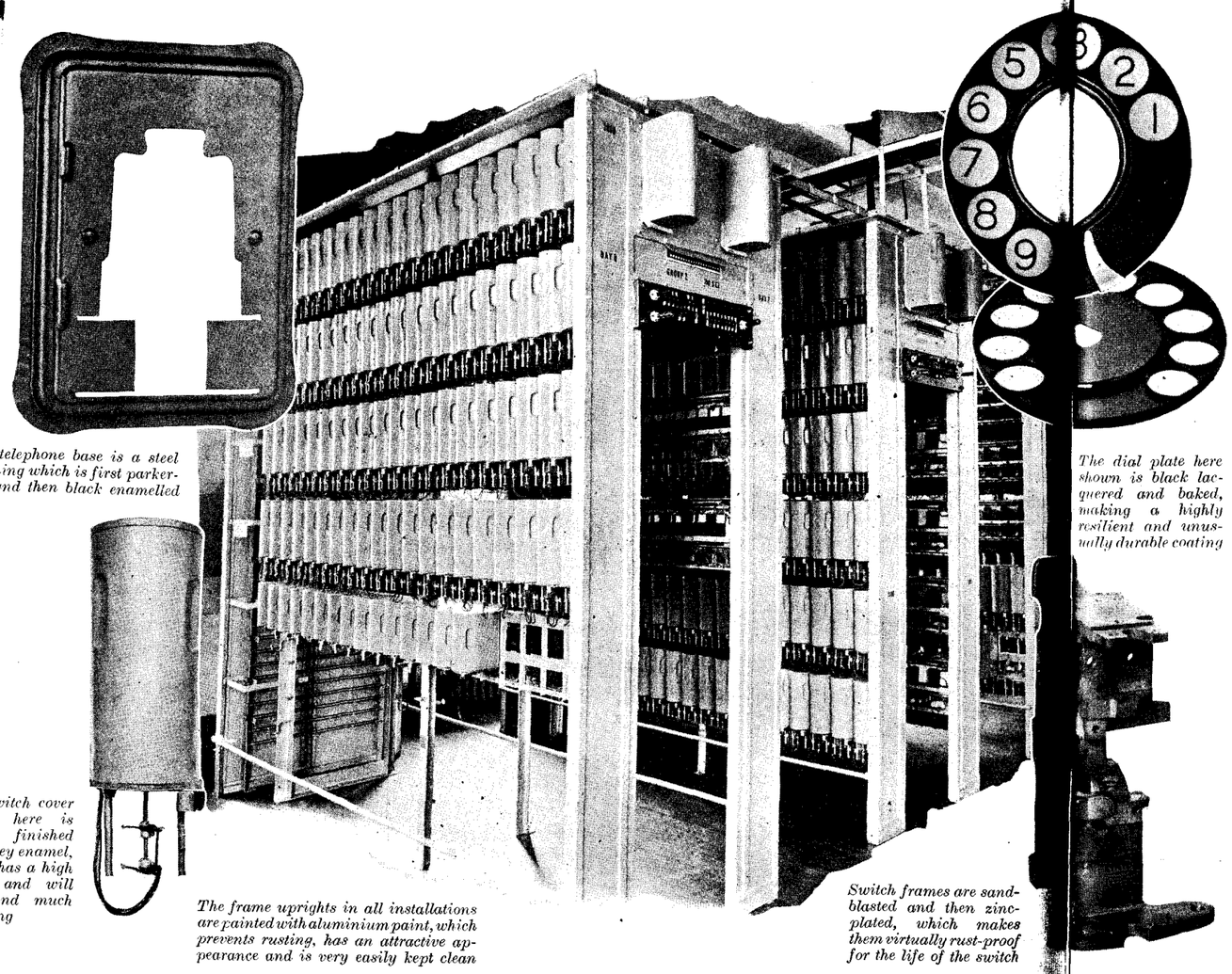
The outlook for 1929 is excellent if we keep pegging away by every means in our power to keep the question of extensions well before subscribers.

The staff of the Telephone Service and of the Engineering Department can do much to assist in preventing any further rise in the ratio, and even with a little additional effort and enthusiasm could help the Contract Branch to push it over the brink and well on its downward course. My last appeal to the staff fell on a hard and extremely sterile rock. Let us hope this one will be more successful.

W. F. T.

Maintaining Strowger Automatic Supremacy—

Special Finishes for Special Conditions



This telephone base is a steel punching which is first parkerised and then black enamelled

The switch cover shown here is spray finished with grey enamel, which has a high lustre and will withstand much handling

The frame uprights in all installations are painted with aluminium paint, which prevents rusting, has an attractive appearance and is very easily kept clean

The dial plate here shown is black lacquered and baked, making a highly resilient and unusually durable coating

Switch frames are sandblasted and then zinc-plated, which makes them virtually rust-proof for the life of the switch

A CASUAL examination of the switches, frames, switch covers and the hundreds of other parts that make up a complete automatic telephone exchange, will reveal a multiplicity of different finishes. While at first glance these finishes may seem to have been selected at random, each one has been chosen for the particular part with an eye to the utmost durability under the most severe climatic and other conditions of actual service.

There is a particular reason, for instance, why certain parts are nickel-plated, some zinc-plated, some grey enamelled and others finished in black lacquer or baked enamel. Only a company with a wealth of experience in the adaptation of automatic telephone equipment to all sets of conditions can know just which kind of finish is the best for each separate part.

All of these various finishing operations are carried out in their entirety by Automatic Electric Inc. They constitute but one of the many instances which might be cited to indicate its manufacturing policy, which is that Strowger Automatic telephone equipment must be produced completely in its own factories. It is felt that in this way, and in this way only, can the quality, durability and performance characteristics, for which this equipment is noted, be properly maintained.

[This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.]

Automatic Electric Inc.

Factory and General Offices: 1033 W. Van Buren St., Chicago, U. S. A.

Sales and Service Offices in All Principal Cities

EXPORT DISTRIBUTORS

For Australasia -- Automatic Telephones, Ltd.
Elsewhere -- Automatic Electric Company, Ltd.

STROWGER AUTOMATIC

The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - Lieut.-Col. A. A. JAYNE. J. STUART JONES. W. D. SHARP. J. F. STIRLING. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

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EXTENSION STATIONS.

THE contributor of the article on "Ratio of Lines to Stations," which we publish elsewhere, properly describes his subject as one which will repay investigation. We may also describe it as one which has not engaged to a great extent the attention of telephone statisticians—at least so far as comparative statistics are concerned. The statistics of most administrations are expressed in terms of telephone stations, and in many cases particulars of the number of main lines are not available. Nevertheless, such data as we possess go to show that the percentage of extension lines in this country is fairly creditable in comparison with the figures of other countries.

Taking first the three largest telephone-using countries, we get the following results. In fifty of the largest towns in the United States in 1925 the average proportion of main lines was 65 and of extensions 35%. (We have no later figures at our disposal, but there is little reason to suppose that the ratio has materially changed.) In Germany in 1928 there were 61 main to 39 extension stations, and in this country in the same year there were 63 main to 37 extension stations. The limitation of the data to large-city development is, of course, favourable to America in the comparision, but it is noteworthy that these three great telephone systems all yield a ratio of extension lines of between 35 and 39%. Surprise may be felt that in the United States, with their numerous giant hotels and department stores which boast a telephone in every room or on every counter, the percentage of extensions is not higher. But the explanation lies in the fact that the United States is also the country which boasts a telephone for every charwoman and chimney-sweep, and has, moreover, an extremely high telephone development amongst small residences. Wherever the residence development is high, wherever in fact the telephone is in use amongst people of every condition, the percentage of extensions is likely to be low. We have looked into the statistics of 1927 for Sweden and Denmark, the two most highly developed states in Europe, and, unlike the three great countries just instanced, possessing but one or two large cities. We find the percentage of extension stations in Sweden was 15 and in Denmark 14.

It remains to be seen to what extent the residential subscriber is an "untapped reservoir" for the spread of extension lines. Our readers will have gathered from our columns that residence rate subscribers increased at the rate of 12.1% in the country last year as against an increase of 4.4% in business rate subscribers; and the former class obviously offer the greatest field for telephone development. If, therefore, the ratio of extensions to main lines is to be improved, the improvement will have to come from that field, and we wish our contributor and his assistants every success in their efforts.

HIC ET UBIQUE.

THE Anglo-Italian Telephone Service (hitherto restricted to Milan, Genoa and Turin) was extended last month to Rome, Venice, and Bologna. Communication with the latter places will be restricted initially to subscribers in the London Telephone Area, but will be made available to the provinces in this country as soon as circumstances permit.

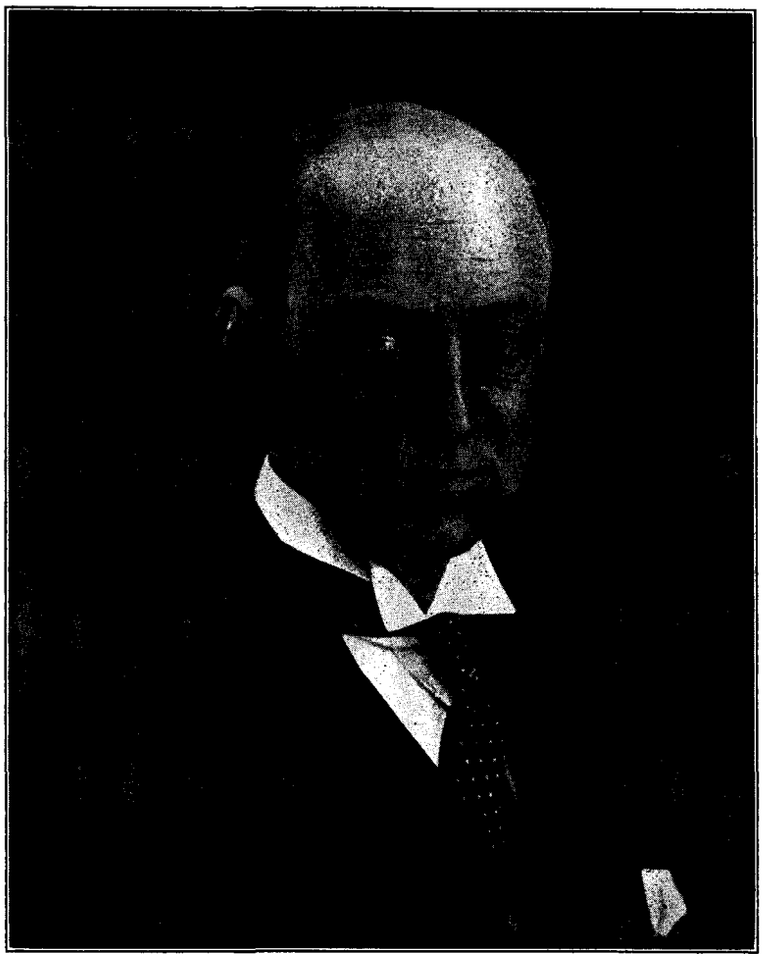
The charge for a 3-minute day call from London to Rome is 13*s*. 3*d*., and to Venice or Bologna 10*s*. 9*d*.

On May 31 a "through" trunk telephone circuit was opened between London and Milan; on June 11 an additional through circuit was provided to Brussels on June 18 to Berlin, and on June 26 to Frankfurt-on-Main. The total number of through circuits now working between London and the Continent is:—

London—Paris ...	22	London—Boulogne ...	1
London—Amsterdam	7	London—Bremen ...	1
London—Berlin ...	7	London—Calais ...	1
London—Brussels ...	7	London—Cologne ...	1
London—Hamburg ...	6	London—Copenhagen	1
London—Rotterdam ...	5	London—Düsseldorf ...	1
London—Antwerp ...	4	London—Lille	1
London—Basle ...	2	London—Malmö ...	1
London—Frankfurt ...	2	London—Milan ...	1
London—Madrid ...	2	London—Stockholm ...	1
London—Zurich ...	2	London—Vienna ...	1

That is 25 "through" circuits to France, 18 to Germany, 12 to Holland, 11 to Belgium, 4 to Switzerland, 2 to Sweden, 2 to Spain, and 1 each to Austria, Italy, and Denmark = 77 in all.

We encountered an old friend in the columns of the *Daily Express* last month. He is the gentleman who writes to the Editor about the backwardness of his own country, and informs him that the automatic telephone is installed "throughout"



[*Copyright by Vandyk, 41, Buckingham Palace Rd.*

THE POSTMASTER-GENERAL, MR. H. B. LEES-SMITH.

Germany and America. He may care to know that the automatic system is installed "throughout" Great Britain in exactly the same sense as it can be said to be installed throughout the other two countries.

Mr. Powell-Jones and Sir Algernon Law have been having a lively encounter in the correspondence columns of *The Times* on the word kiosk (or kiosque). Sir Algernon seems to be in "a state of mind"—if we may so express it—about the use of this "hideous alien word" by the Post Office. Mr. Powell-Jones scored, we think, in pointing out that Sir Algernon's letter contained a score of alien words. The head and front of the offence, it seems, is the introduction of a new "blackleg." But the word "kiosk" is by no means entirely new, and whether it is hideous is quite a matter of opinion.

Telephone service between Great Britain and the Isle of Man was opened on June 28. It was inaugurated by a conversation exchanged between the Postmaster-General and the Governor of the Island, Sir Claude Hill.

The special correspondent of the *Evening Standard* recently wrote an enthusiastic account of the foreign trunk exchange in London and of the linguistic accomplishments of the operators. With wireless services opening up wide possibilities, with new countries coming into the Anglo-European system almost every month, a few years hence may see the Trunk exchange rivalling the tower of Babel. At least, so it seems to the wandering and unchastened phantasy of the writer of the following:—

POLYGLOT.

I HEAR you calling me
in Urdu, Tamil, Bengali,
or, what is rather worse,
in Erse.
Daylong our Trunk exchange resounds
With Babel-baffling sounds.
I hear them call in Portuguese, in Spanish
(the high Castilian), Swedish, Danish,
Basque, Flemish, Finnish, Magyar, Dutch and Norse,
Polish and Czech, of course.
And while the signals wink and glow
Parisian accents flow,
"*Parlez un peu plus haut—*
Elysée, quatre-vingts virgule treize!"
Or else, in less official phrase:
"Galubchik, get me Yaroslav
or any handy Russian line you have!"
One calls, in pure Canadian, for Toronto;
another: "*Roma, mia cara, pronto*";
a third "*Die Nummer ist besetzt.*
Ich ruf' Sie wieder an . . . . Sie haben jetzt
den Anschluss." Then in resignation gentle
one cries with fatalism oriental:
"From Baghdad no reply! *Bismillah!*
La haula wa la quwwat illa billah."

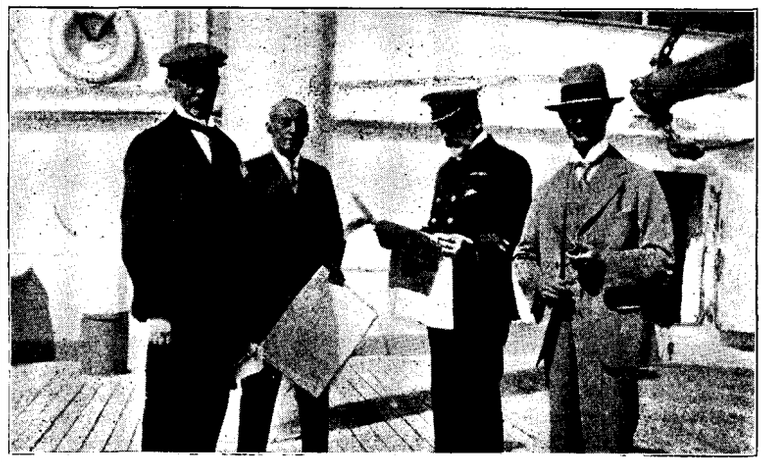
And if to impotence they doom us
by calls in language recondite and strange
for lands beyond our ken
outside the telephone's wide range
regretfully we answer then
in Latin: *Non possumus!*

W. H. G.

NEW TELEPHONE CABLE TO ISLE OF MAN AND IRELAND.

[*Abridged from an address given by* Mr. T. E. HERBERT, M.I.E.E., *to the Douglas* (*Isle of Man*) *Rotary Club.*]

FOR many years it has earnestly been desired both by the Manx people and equally by the British Post Office to link up the Island and the mainland by a telephone cable. That problem has

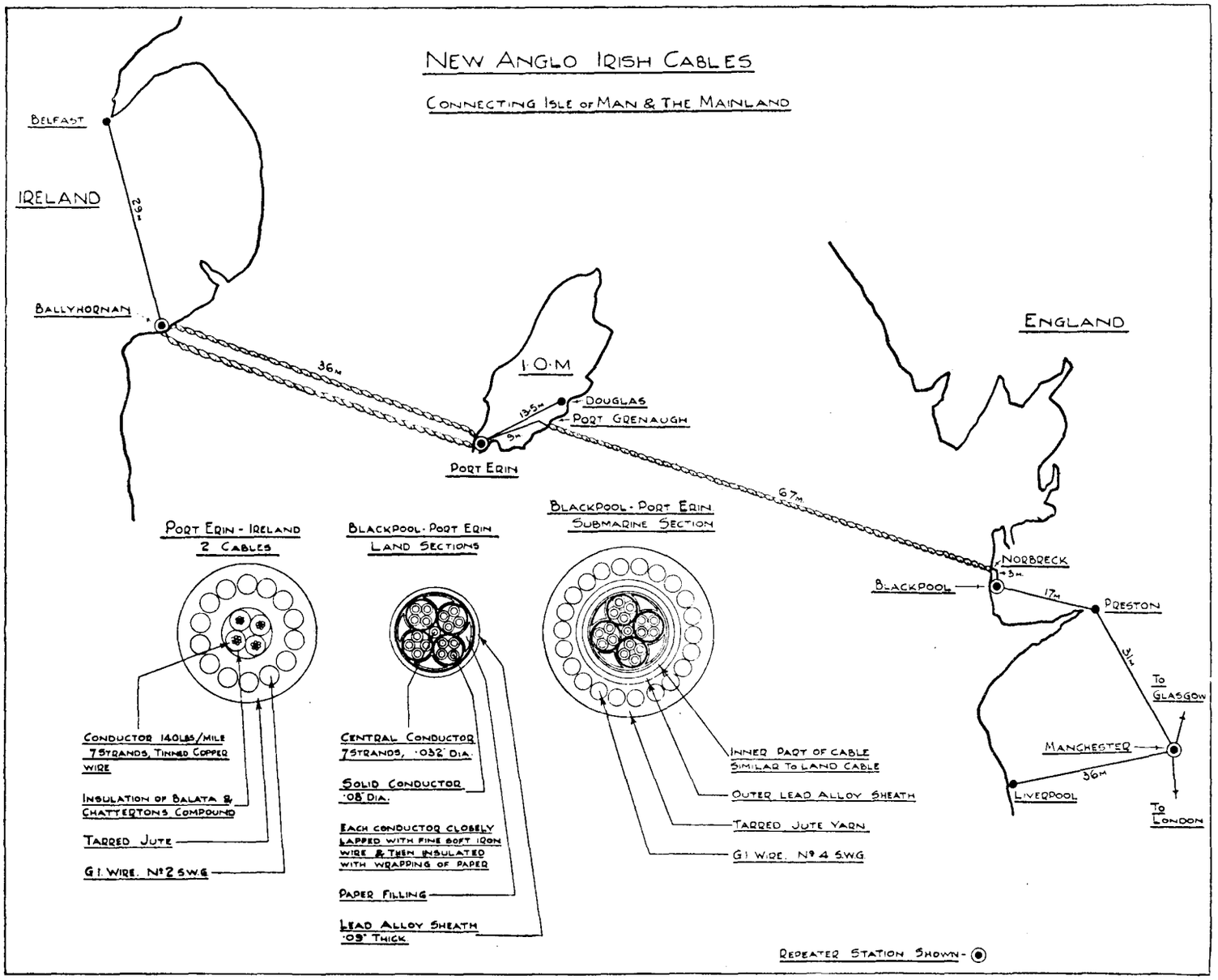


MR. W. J. MEDLYN. MR. DUDLEY STUART. CAPT. H. F. BOURDEAUX. MR. A. L. DE LATTRE.

never been dropped. To-day it has been solved by the addition to it of the need for more Irish cables. A cable for the Isle of Man alone is still, and would perhaps for ever have remained, an impossible economic proposition.

When the necessity for those new Irish cables became apparent, there were many serious engineering problems to be faced.

By the end of 1927 those had all been solved, and it was then possible to determine the cable landing points, to decide on the route and arrange the necessary wayleaves.



The cable which will connect Port Erin with Blackpool contains four groups, each group consisting of four copper wires. There is also a central stranded wire, but this will be used only for testing purposes between Liverpool and the Port Erin Repeater Station. Three groups of the four-wire cores are appropriated for use between England and Ireland. The fourth group is provided for the Isle of Man. It is, of course, necessary to have two wires for a telephone circuit, and so these four wires give us two telephone speech channels. But, by a simple device known as superposing, we can, in addition, obtain a third circuit also. This is done by an electrical device which causes the speech on this third channel to pass along both wires of one pair and back along both wires of the second pair.

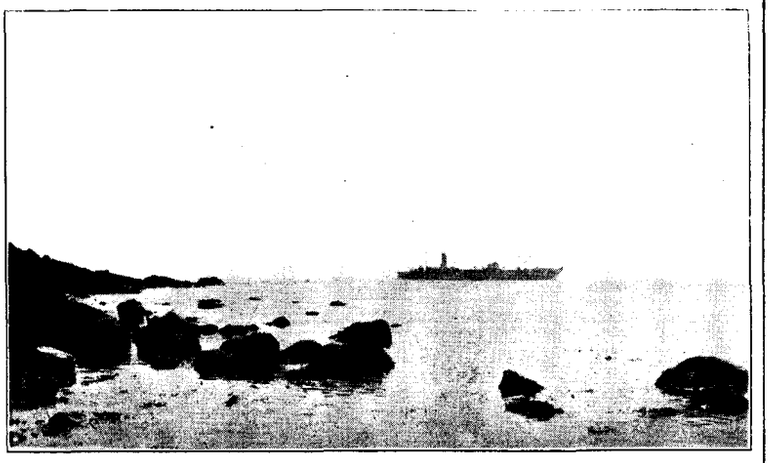
Now as to the sea portion of the cable. There are two lead sheaths with a layer of bituminous compound between them. This is in order to ensure their watertight condition. When, due to mechanical damage, water enters the cable, it does not penetrate very far along the cable, and this is another advantage of the very close packing. The double lead sheathed cable is protected from mechanical damage by heavy armouring. The weight of the cable is about 1,250 tons.

The circuits connecting the Isle of Man and England will terminate on the switchboards in the Exchanges at Liverpool and Douglas. From the Douglas switchboard the circuits pass through a cable to the Port Erin Repeater Station. This cable has small conductors, and inductance is added by inserting loading coils (a species of choke coil) every 2,000 yards. At Port Erin the speech currents pass through a repeater and thence through the submarine cable to the Blackpool Repeater Station, where another Repeater is inserted. Onwards in a cable to Manchester, where yet another repeater is employed to transmit the speech to Liverpool. Now the number of repeaters which can, without distorting such speech, be inserted in any circuit is well nigh unlimited. Many Continental and American conversations require as many as 20 repeaters.

As to the Irish circuits, it may be interesting to tell you that the design of the cable to be used constituted a serious problem owing to the depth and currents likely to be encountered. Ultimately it was decided to lay two ordinary four-wire Balata insulated cables about half a mile apart. We shall have, therefore, four physical and two superposed circuits between England and Ireland. These will be used to form two Liverpool—Belfast, two London—Belfast, and two Glasgow—Belfast circuits.

Now just a few words about the Port Erin Repeater Station. It differs only in size from those already working in various parts of the country. Its function is to receive the attenuated or feeble telephone speech currents and to transmit onwards full strength currents precisely similar to those received. This is done by thermionic

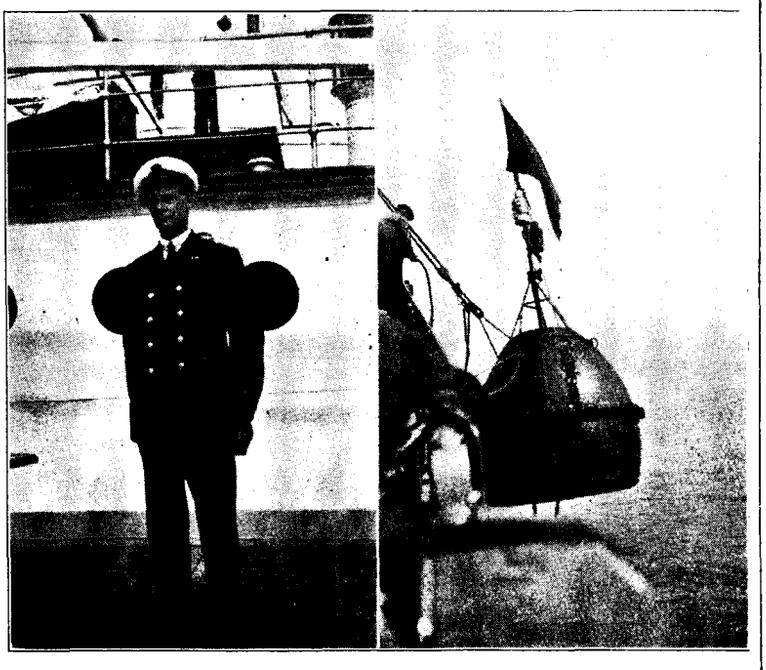
valves. But the energy required for their operation involves secondary cells and a power plant. Two oil engines capable of developing 38 brake horse-power and two 24 volt batteries of nearly 1,000 ampere-hours capacity and two 150 volt batteries of 70 ampere-hour capacity for the anode circuit of the valves and a



C.S. FARADAY AT PORT GRENAUGH.

similar battery for lighting the building are provided. There are in addition all the controlling switches and testing apparatus required to check and to measure the efficiency of the plant.

Whilst I have told you what are the arrangements for working the circuits now, you may be interested to know that the possibilities of the cables have by no means been exhausted. Each *two* pairs of wires yields *three* speech channels, but it is possible also to obtain



CAPT. ROBT. ALLAN OF THE FARADAY.

LOWERING CABLE BUOY (ROUTE MARKING).

additional channels on the same circuits by using an alternating current having a frequency of 7,000, which is beyond the highest frequency necessary for speech transmission. This current is modulated by varying its amplitude in accordance with the ordinary speech currents. In this way it is possible to obtain an extra channel. By adding other higher frequencies still more channels become possible. This, however, involves considerable complications in the apparatus arrangements and still more problems in telephone engineering.

THE TELEGRAPH SERVICE IN 1950.*

BY JAMES J. TYRRELL.

ABOUT two years ago, Sir Henry Bunbury, from this platform, made the following appealing statement in connexion with Telegraphy in general and the Telegraphs of our own country in particular.

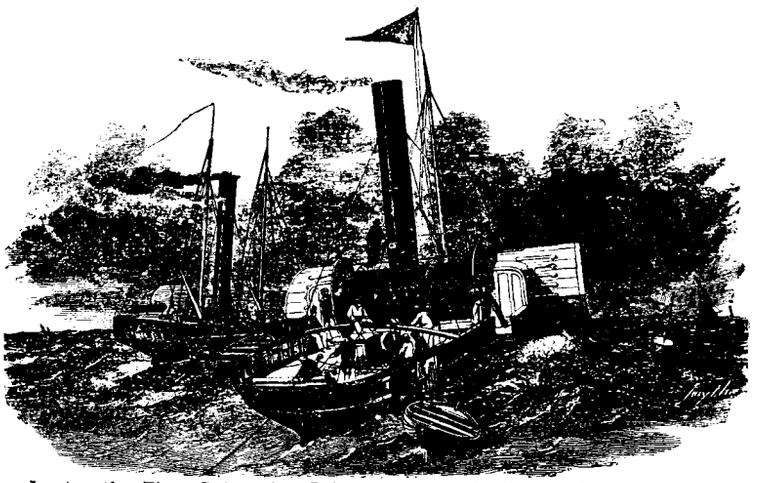
" I do not want so much to know," said Sir Henry, " what the Telegraphs were like 20, 30, and more years ago, but what I would like to know is what will they be like 20 or more years hence."

In taking this opportunity of fulfilling a promise to our esteemed Accountant-General, and in presenting something in the nature of a reply to his question, I must admit to considerable diffidence this evening in even attempting to assist one whose general knowledge and widely recognised ability overshadow most of us.

However, sometimes the mouse may be able to help the lion.

The mouse proceeds ! Without so soon forgetting the prohibition regarding " the dear dead days beyond recall " of the telegraphs, let me commence by projecting a few pictures of past telegraphy upon the screen. I think, by giving a very brief backward look, we shall be the better able to obtain a truer perspective of our subject. It will remind us of the pioneer work done in this country, and of the very solid fact that telegraphy under British administration has not stood still for long. It has, at the moment, certainly reached a critical point in its history, but it is not a dying industry by any means.

Fig. 1 marks an epoch in the history of cable telegraphy, and shows the pioneer act of laying practically the first submarine cable between England and France—actually between Dover and Calais in August 1850.



Laying the First Submarine Cable. Dover to Calais. August 31st, 1850.

FIG. 1.

At this time the Inland service was already a going concern in the hands of private companies, the railways included, and there were working wires along the London, Chatham and Dover Railway which gave communication between these termini. The actual link between Dover and the English end of the cable was not complete until November 1852, traffic between Paris and London being man-handled over for re-transmission in both directions until the date just mentioned.

The actual ceremony is depicted (in Fig. 2) in a room at No. 30, Cornhill, where the artist of the *Illustrated London News* made a sketch of the scene on the premises of the European and Submarine Printing Telegraph Company.

That was nearly 20 years before the transfer of the Inland Telegraphs to the Post Office, and 47 years before the bulk of the Anglo-Continental circuits were merged into Government hands, because of their inefficiency.

Jumping the historic year of the Inland Transfer, we come to 1891, during which period the Press took considerable interest in the Government-owned telegraphs. This interest was, no doubt, augmented by the fact that the expansion of the Anglo-Continental services, subsequent to their transfer in 1889, had necessitated the removal of their headquarters from Throgmorton Avenue to St. Martins-le-Grand two years later.

Hence a publicity the like of which I do not recall until last year—only that was in another direction !

Those were the days of Morse sounders and high-speed Wheatstones, aided, on certain minor circuits, by a few single needles, double-plate or bell sounders, and A.B.C.'s. It was at this period that the experimental 6-channel Delany Morse Multiplex was introduced, an invention which deserved a better fate than extinction.

From Fig. 7 you will have observed that less than 40 years ago accumulator or secondary cells had not yet come into their own, primaries being used

* Paper read before the London Telephone and Telegraph Society.

for all circuits, main and local. They were accommodated in the basement of the C.T.O. on shelves the total length of which was well over 2½ miles. It is not possible for the present generation to realise how great was the boon when secondary batteries were installed.

Very marked as had been the improvement in the standard and upkeep of the overhead lines, after the transfer of the Inland telegraphs to the Post

FIG. 2. OPENING THE FIRST DIRECT TELEGRAPH CIRCUIT BETWEEN LONDON AND PARIS, NOV. 9, 1852 (*Illustrated London News*).

Office, quite an appreciable mileage, at this date, was still well below the insulation standard of to-day, while the underground wires were gutta-percha covered, also of comparatively low insulation, and of heavy capacity effect—vastly different from the air-spaced, paper-insulated, multicore, lead-sheathed cables of the present century, which provide some 100% more conductors in the same underground space. Even this progress may appear slow when gauged by post-war standards, but the Telegraph Service of Great Britain by that time had made distinct advances as regards the expeditious disposal of its traffic, the quality and improvements in its telegraph apparatus and the construction and maintenance of its lines. It was a model for our colonies, and for the greater part of the world. The next two decades saw still further developments in construction and a still higher standard of excellence in maintenance.

FIG. 3. CENTRAL TELEGRAPH OFFICE, LONDON (CENTRE), G.P.O. NORTH IN COURSE OF ERECTION BEYOND (*The Engineer*, Dec. 1891).

Practically coincident with these developments there came the movement in the trial and adoption of high-speed, type-printing telegraph apparatus, due to the perfectly correct policy of getting the most out of a conductor and thus saving wires. By a strange freak of circumstances the first type-printing apparatus to be worked extensively by the Post Office was the Hughes, introduced by the Submarine Company at its transfer in 1889, about the only good thing—except the staff—which came over with that transfer.

Of the systems subsequently tried and tested there were undoubtedly more than one or two which have given excellent results, but their success has not been consistently maintained.

That is still the position to-day. Ingenious, excellent, line-saving inventions, the potentialities of which have been tried out successfully in laboratory, workshop and under working conditions.

Stable battery power, an exceedingly high standard of line and line maintenance, certainly unsurpassed on the Continent of Europe—and a staff whose adaptability to new conditions has never seriously been challenged.

Yet, despite these promising factors, the Telegraph Service of Great Britain is admittedly not what one would call popular. This is, unfortunately, reflected in adverse financial results, though the latter is certainly not entirely due to the quality of service given. I would, indeed, stoutly maintain that the Telegraph Service of this country does not deserve anything like half the hard things that are said concerning it.

Nevertheless, with our usual British candour we all admit that it is not as near perfection as we would all wish to see it.

What, then, in these circumstances, may we expect to be the position in another 20 years ?

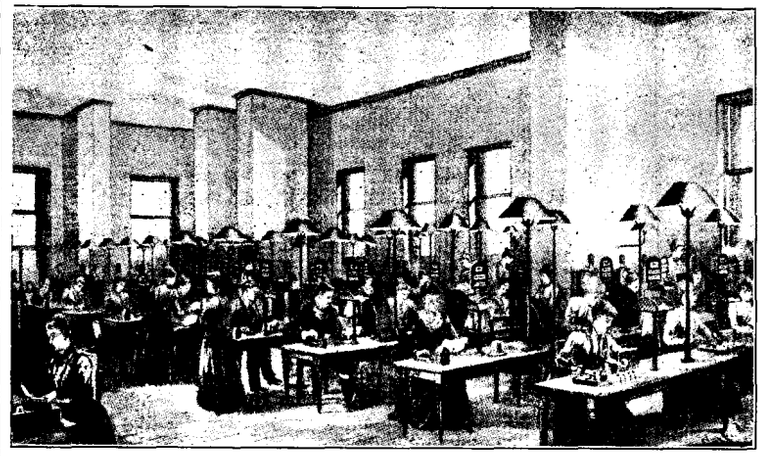


FIG. 4. C.T.O.—A PORTION OF THE METROPOLITAN GALLERY.

Let us note down the forces which are operating and are likely to operate against the progress of the Inland Telegraphs.

Forces operating against the Telegraphs :—

(1) The competition of the Telephone
(2) The competition of the Post.
(3) The heavy cost of delivery and the retarding effect of the natural attempts at economy at this particular stage of a telegram's transit.
(4) The disappointing results of high-speed printing telegraphs in this country.
(5) The failure to popularise the Telegraphs or to rebut in any way the uninformed criticisms of the Press.

With regard to Nos. 1 and 2, it will undoubtedly prove an accurate prediction that both these forces will continue as competing factors.

The Posts, the Telegraphs and the Telephones are all actually transport services, and, with the changes which have been brought about by modern scientific discoveries and human ingenuity, it is inevitable that one should from time to time intrude upon the province of the other.

FIG. 5. GENERAL VIEW OF PROVINCIAL GALLERY.

Eventually each will find its own economic and utilitarian sphere in the scheme of things.

Indeed, in studying the whole of the communication and transport services, road, rail and canal included, it is interesting to find that there is a definite point where even the slowest means of transport, from one cause and another, has a very definite economic value.

Thus, even canals are coming into their own again, while horse-haulage is still the cheapest for certain work. I note that, with the local horse-drawn dust-cart, the driver is able to assist in emptying the dustbins, while the stop-start is left to the intelligent beast in the shafts as the vehicle moves from door to door, while a specially constructed motor-lorry periodically visits the collecting area with empty dust-carts, exchanging these for the horse-drawn filled vehicles, which are then rushed away to the shoot.

That the present critical position of the internal telegraphs, not only of our own country but of other European countries, is part of a general readjustment of values there can be little doubt. That small countries, such as Switzerland, with an efficient telephone service covering a fairly dense area, have seriously felt the loss of telegraphic traffic appears to confirm this.

It may, therefore, be stated somewhat definitely that for short distances, say up to 20 miles, the telephone will always prove superior to the telegraph, except in about 20% of such traffic where (*a*) documentary evidence is an essential as well as speed, and (*b*) where the addressee is not a telephone subscriber.

This latter traffic will naturally be a declining value, actually to be reduced to nil so soon as the telephone shall have reached the 100% point of absorption. Long before this is reached, I should not be surprised to see the disappearance of the telephone surplus.

With the disappearance of the surplus and the addition of some thousands of subscribers, the question of increased rates may justifiably arise. After all, the addition of every new subscriber increases the potential value of one's telephone. The essential point, however, remains that, even should an increase of tariff prove practical or politic, momentarily this might assist the telegraphs, but it would not, *could not*, last. The telephones would soon

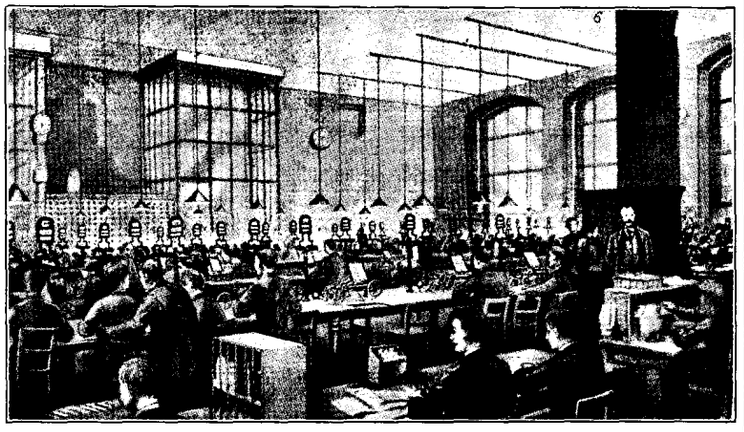


FIG. 6. C.T.O.—GENERAL VIEW OF ANGLO-CONTINENTAL CIRCUITS.

forge ahead again, but this very progress of the 'phones, I should not be surprised, will actually and eventually act as a permanent reviver of the telegraphs, as I hope to show.

(2) *The Competition of the Posts.*

"A strange proposition," some may say, but I venture to suggest, for careful consideration, that competition from this quarter is likely to prove a very real one in the future. We must not be blind to the transport developments around us. Can we not visualise the initiation of a new kind of express letter at a much cheaper rate than that at present possible? Let us say a 15-minutes motor service between all large towns by way of the public high-speed motor roads which, running out of our large towns and cities by means of viaducts, will in future enable fast traffic to leap the congested centres into the urban districts and so on. Such a service would be able to deliver express letters well within an hour between, say, London and Brighton, Southend, Romford, &c., and at a much smaller fee than that at present demanded for the same service, say, between Hampstead and the City.

Such a postal service will wipe out 50% of the telegraph traffic between London and 60 miles round. Alternatively, is it a mere guess to say that within the next decade it will be easily possible for small aeroplanes (say, of the gyroscopic type) to land upon and to take-off from the roofs of even moderately-sized post offices?

What is to stop the Postal side from initiating an express letter service by *this* means?

Express tubes specially built for high-speed travel are no mere dream. They will arrive, and it may come to pass that it will be quicker to go home and tell your wife that you are not coming home than to telegraph or even telephone her!

In 1924 Mr. Donald Murray's view was that the telegraphs in this country have suffered from the pressure of the telephones on one side and of the Postal Service on the other.

Mr. Archibald, fresh from his delightful trip to America, confirmed this economic reaction in the reverse direction, when he stated that a contributory cause of the *success* of the telegraph services of the United States was the indifferent standard of the American Postal Service. We can, I think, accept the broad principle that an expeditious and *cheap* postal service is bound to have reactions upon a dearer, even though 100% more expeditious *telegraph* service.

FIG. 7. BATTERY ROOM.

I do not for one moment suppose that the Mails Branch has placed the stamp of finality upon its activities. The Postal side is saying good-bye to much of the slower means of transport, both human and equine. In our picture of the C.T.O. in 1891 we noticed a horse-drawn postal van coming out of the G.P.O. East yard. Six years after that picture appeared, the Postal side had already considered the possibilities of accelerating its services by means of contracted internal combustion-driven vehicles. The war period held back developments, but 1919 saw a bigger stride when the Post Office became effectively a motor transport *owner*. At the moment the Mails Branch has a staff of no less than 4,000 postmen motor-drivers, their number and that of the machines growing every week.

Assuredly such new "air" and "road" services as I have adumbrated would not present any real difficulty to the Postal Department of the British Post Office. Someone asks, "Suppose these services were *not* initiated by the Post Office?" The result, so far as the telegraphs are concerned, will be the same, for private enterprise will naturally seize on these obvious facilities for more rapid services, and either urge them upon the authorities or itself exploit them. The small aeroplane will prove remunerative as a messenger and carrier to all large organisations between its factories and offices, &c., while the taxi aeroplane will, no doubt, arrive.*

FIG. 8. DELANY MULTIPLEX.

Undoubtedly the human organism of the future will be more and more attuned to the high speeds of to-day, and to those of to-morrow, still higher.

The average intelligence and the general knowledge of the population will also be such that neither wire or wireless telegraphy will any longer mystify the man in the street.

* Since this paper was delivered, a taxi service has actually been opened near London.

The criticisms, too, of the average person of the future will certainly be better informed than they are to-day. This will be all to the good as regards an efficiently-run telegraph service, but rather a sad case for any service below that of first class. With the swifter standards of air and road transport, with the personal touch with wireless apparatus and fairly clear conceptions of the speed of a telegraph signal, 1950 will demand something decidedly in advance of to-day's criteria from the telegraph service, whose transmission speed is measured not by a few score of miles per *hour*, but by thousands per second.

The business man of to-morrow will not accept the excuse that the transit time on a foreign telegram in England was only 30 minutes as against 60 minutes on the Continent, the obvious retort being "All the more reason to speed up this side of the Channel."

(3) *The high delivery cost of a telegram.*

This particularly heavy handicap of the telegraphs of this country is generally acknowledged. The solution of prompt delivery at low cost will not, in the future, be met by the walk system, or even by a premium on the number of telegrams delivered per messenger.

In passing, one feels bound to emphasise the fact that the difficulty of expeditious delivery, unless it be to a comparatively small group of telegraph users, within a comparatively restricted area has never devolved upon the private companies in this country. To the State organisations has been left the exclusive privilege of dealing with this, the most expensive individual item—that of delivery to the suburbs, the smaller towns, the villages and the remote hamlets of the United Kingdom.

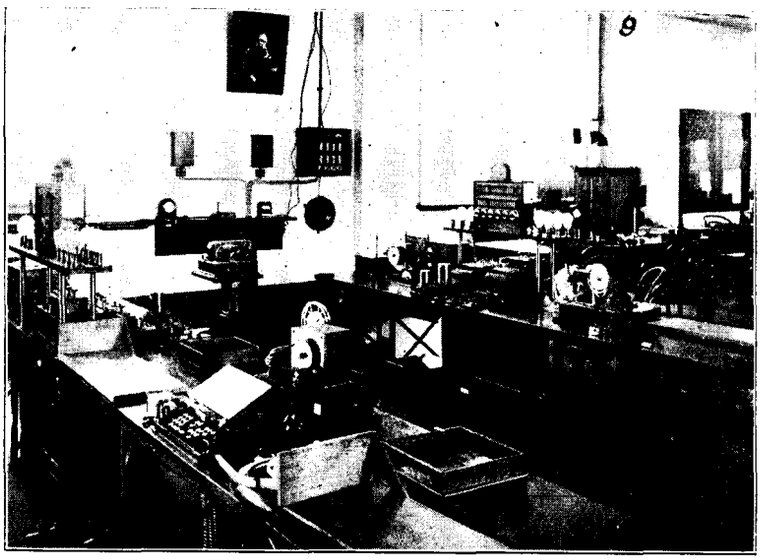


FIG. 9. CHRISTCHURCH AND AUCKLAND MULTIPLEXES TERMINATING IN WELLINGTON, N.Z. KEYBOARD PERFORATORS AND AUTOMATIC TRANSMITTERS. WHEATSTONE LEAK FOR TESTING FAULTS ON SETS.

I have no information as to the transit times of telegrams well outside the large cities of the U.S.A. with which to make comparisons, and Americans are rather silent on the quality of their telegraph services *outside* the larger cities.

(4) *The disappointing results of high-speed printing telegraphs in this country.*

These results are admittedly disappointing because of a certain degree of instability which so far has accompanied their installation.

The disconcerting feature of these difficulties is undoubtedly the indisputable fact that similar, and in some cases identical, types of telegraph apparatus work all but unfailingly hour after hour in other countries.

In Russia—my latest information is dated December, 1926—50% of the Moscow traffic is dealt with by means of double and quadruple forked Baudots. Start-stop mechanism has also been adapted to certain Baudots by Mr. Kaoupouge. The Russians introduced the multiplex as far back as 1906, the year succeeding that in which a small expedition from the C.T.O. installed Baudot multiplex between Calcutta and Simla with Allahabad intermediate, between Calcutta and Madras, and also between Madras and Bombay. The terrain and atmospheric conditions are by no means easy, but these and many other circuits similarly equipped have worked satisfactorily year after year, the Madras-Bombay circuit carrying heavy code traffic. The mechanics were selected and trained natives.

In the U.S.A. also, as we all know, multiplex with keyboard perforators and automatic transmitters have given excellent results for quite a lengthy period, and they have not stopped at that. In New Zealand, multiplexes of the same distributor type have been for some years the mainstay between Auckland and Wellington and Wellington and Christchurch. On these circuits more than 50% is in letter code, but the stoppages are few and brief, and the working hours are sometimes 23 hours out of the 24.

These facts are none too flattering to one's telegraph pride as against the complaints one hears concerning the home service, and in view of the high place which telegraph development in the old country has held in the past.

(5) *The failure to popularise the home telegraphs or to rebut, in any way, the uninformed criticisms of the Press.*

This last feature is thrown into greater relief by the booming and publicity given to the telephones. One has no narrow or foolish, jealous regrets at the progress of the telephones, but the telegraph man does somehow, sometimes, feel that if only a few crumbs of this publicity and endeavour to meet the public could have been spared for the telegraphs, the present condition of affairs would not have been so parlous.

The result of this apparent neglect has had a very serious psychological reaction on a staff which, proud of its craft, feels that it is undefended, must not attempt to defend itself to the public, and that nobody cares for a dying industry. The Inland service also notes the canvassing efforts and the personal touch employed in connexion with the Anglo-Continental cables, and again feels that it is a neglected service.

This will, no doubt, be remedied in the near future, but that it is a very real factor in reducing the *quality* of the service is undeniable. I know full well that telegraphists as a body work for something more than the mere pay they receive, welcome as that may be.

I cannot envisage an administration of the future ignoring this craft spirit.

Does the position look hopeless as regards the future? Emphatically not. The Telegraphs is not itself a dying industry, but a growing one, viewed on the grand scale and the wide horizon.

(To be continued.)

GLASGOW TELEPHONE NOTES.

ON Monday, June 17, a happy party of about 100 went for the annual trip provided by the staff for the wounded or disabled service men still attached to the hospitals in this district. This year the outing consisted of a motor run from Glasgow to Luss via Helensburgh, a "voyage" on Loch Lomond from Luss to Balloch, tea at Balloch Castle, and thence back to Glasgow. There were boys from the Bellahouston, Erskine, and Ralston Hospitals, and the way they enjoyed themselves was ample reward for the trouble taken on their behalf. If only our contributors could have seen what joy resulted from their weekly subscriptions they would feel more than ever that the idea was well worth while.

The party was accompanied by Mrs. Col. Westbury, Mr. and Mrs. Currie, Mr. and Mrs. Coombs, Mr. and Mrs. T. S. Ward, Misses Kay, Gray, Newlands and Horrocks. Mrs. Westbury presented the prizes won in connexion with the putting and balloon competitions.

Miss M. E. Colquhoun, of our Central Exchange, has just returned from a holiday in Paris. During her visit to the Gay City she visited the Ségur and Vaugirard Exchanges and has returned to Glasgow thoroughly charmed with her reception and treatment by all whom she had the fortune to meet in connexion with the telephones "over there." Miss Colquhoun is just bubbling with enthusiasm and thanks and cannot speak too highly of the courtesies extended to her. May we of the Glasgow Office join with her in expressing our appreciation and, by the same token, voice the hope that we shall some day be able to reciprocate.

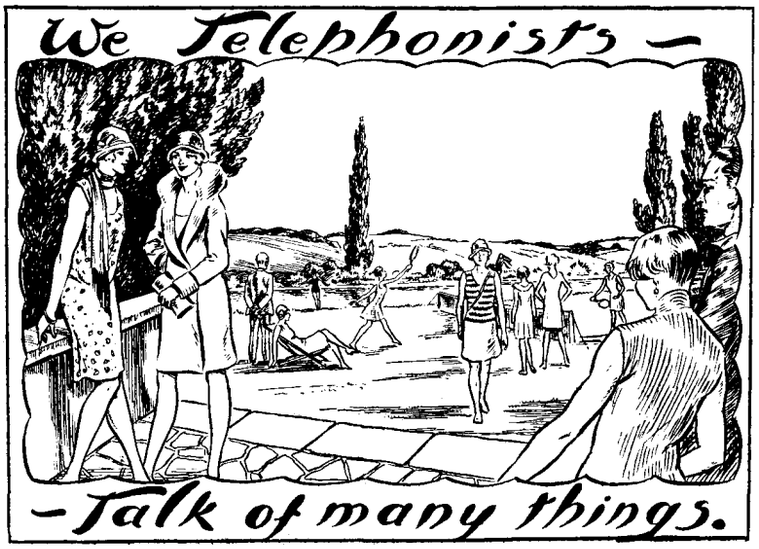
Will the Paris papers please copy?

What is known as the "May Removal Term" has a special significance so far as this district is concerned. In effect it means that changes of residence are chiefly concentrated into a short period round about May 28 each year instead of being spread over the different quarters as it is "over the border." This year of grace provided something of a record, for no less than 2,156 removals were involved. It is a matter for congratulation that a period of considerable stress was met and surmounted with little or no service difficulties, despite the coincidence of added pressure and special arrangements consequent upon the General Election.

During our recent series of telephone lectures the following extract from a letter was very well received:—

> "I was only joking when I said that I didn't mean what I said about reconsidering my decision not to change my mind. I really mean this!"

What did the writer really mean?



The Road Opposite.

So many of the tasks which we set ourselves to do depend upon the atmosphere with which we are surrounded. Bodily comfort promotes that security of mind out of which proceed the gentler philosophies. The wearing of a hair-shirt tends to produce the series commencing "Thou shalt not," and the wearing of a soft shirt (or, indeed, no shirt at all) tends to produce the mellower permissive series. Whether or not you will agree with the first pronouncement I do not know, but you will probably decline, with becoming modesty, to be drawn into a discussion as to the truth of the second and its *parenthesis*.

Behold me, then—well, almost shirtless—on a sunny verandah in a deep easy-chair with soft cushions and a pipe which is drawing pleasantly. Yet, despite these creature comforts, I find it difficult to settle down. There have been times when I have found it next to impossible to settle up, but, on this occasion, the task of settling down is even more difficult. The pen is ready to flow, and the fair sheet of paper, virgin in its purity, awaits its caligraphical martyrdom. But I cannot settle down because of that road opposite. Ever and anon I find that my gaze has lifted from the paper and is resting contemplatively on the road opposite.

It is doubtless quite an ordinary road, and occasionally a solitary figure moves along it, but it seems to have no beginning and no ending. Down across the lawn past the sundial (where the rabbits are feeding), across the small field where the black rocks poke through, are trees, and it seems as though that road must be born among them. At any rate, where the trees break away there is the road, a narrow ribbon gleaming between the hedges, and then it dies away in a further clump of trees and is lost. Lost, do I say? —well, no. I fancy not, for is there not a faint path going forward up the hill across the field and—yes, a stile in a low stone wall. Beyond that the path must be hidden by another stone wall which runs at right angles to the first and stretches up to the top of the hill, because, on the skyline, I can see a gap in the wall.

Of course, it is very foolish to allow one's thoughts to be distracted from the business in hand by a very ordinary road, a meandering footpath and a matter-of-fact gap on the skyline, but the whole thing fascinates me—particularly the gap. There must be something other than sky and cloud beyond the gap, and if I were not so busy, I would just walk those few miles *to settle my conjectures. Quite apart from that, what would people say if* I rose suddenly from the depths of cushions and walked on such a hot day, merely to satisfy an idle curiosity. And I know very well that, once I forsake this shady and luxurious ease, one, even more slothful than I, would bag my place of vantage. "To-morrow, perhaps," I murmur to myself, and the gap hears and mocks me with its vacant grin. "Or the day after," I continue deceitfully, "or possibly in the cool of to-day," I add weakly. "Oh, hang it! I must go now, and through the gap into the land of imagination." And so I fell asleep!

PERCY FLAGE.

Elizabeth Garrett Anderson Hospital.

I am sure that all the kind folk who worked so hard last year in preparing various articles for the different bazaars, arranging dances and assisting in endless other ways to collect our £2,000 would have been amply repaid for their labour, had they been able to share in my pleasure of observing the wonderful results obtained.

Although my literary efforts are not of the best quality, it would be kind of you to bear with me for just a little while, and perhaps I could give a little account of the good fortune it was mine to enjoy.

It was two o'clock on a Wednesday afternoon, and two girls (who had the luck to be present at the opening ceremony), and myself made our way through the dense crowd of people who were waiting outside the hospital to welcome Her Majesty the Queen. After a struggle we reached the hall, and there, after two policemen and two commissionaires had viewed our tickets, we were allowed to enter. We arrived early, and we were fortunate in getting seats almost directly opposite the position the Queen would take when performing the ceremony, so, being well to the fore, as all good telephonists should be, we settled down comfortably in our seats to study our programme, listen to the band of H.M. Coldstream Guards and, incidentally, study the new spring fashions. At about three o'clock hoarse cheers were heard, and the bells of St. Pancras sent out a merry peal of welcome, and we, feeling very thrilled, waited breathlessly, as we knew this must be a signal that Her Majesty was near. A moment more, and the band commenced the National Anthem, and Her Majesty, looking the most regal of Queens, entered, escorted by Mr. A. Gordon-Pollock, the Chairman. Her Majesty was conducted to a seat on the flower-decked platform, and was there presented with a bouquet (the flowers were so arranged that they formed a fan) by the little granddaughter of the Chairman. The Chairman then addressed Her Majesty, and thanked Her Majesty for sparing part of her valuable time in attending the ceremony. In the course of his address, the Chairman stated that the Hospital was founded in 1866 by one Elizabeth Garrett Anderson, from whom it derives its name. Since 1866, rapid strides had been made, new buildings had been acquired (this being made possible by the generous donations of sympathetic patrons), and now in 1929, the existing Hospital had been entirely reconstructed and equipped on the latest scientific lines, and a new wing added, which included (1) two surgical and medical wards, with sun balconies, 18 beds in each, (2) a maternity ward, (3) a children's ward, (4) two operating theatres, (5) an enlarged out-patients' department, with its own operating theatre, and (6) a new X-ray department; and the Chairman added that this Hospital was the first in the Empire to be devoted entirely to the interests of women and children. Her Majesty was then asked to receive a basket of jewels, and also to receive purses, the contents of which had been subscribed by various sections of women and children. One by one the representatives of the various sections made their curtsey and presented their purses, until we heard the Chairman announce "Miss Cox—Women of the Telephone Exchanges in London," and then we sat forward and eagerly awaited the supreme moment. Miss Cox made a graceful curtsey and presented the purse to Her Majesty. We applauded, and I could not help but wish that all those who had worked so hard had been with us at that moment. After the presentation, Her Majesty was offered the golden key of the wing by the architect, and Her Majesty then declared the wing open. Her Majesty was then asked to inspect the new wing; to this Her Majesty consented, and was escorted from the hall. We were then entertained to tea, which we did full justice to. The only thing is, I hope the waiter will never recognise me, or the consequences might be serious. After Her Majesty had taken her departure, we had the privilege of viewing the new wing. It was here we saw and realised the wonderful result of our contribution toward the building and equipping of this wing. What struck one so forcibly when entering the wards was the brightness, cleanliness, freshness, and, above all, the homeliness. Each of the wards we inspected had its own colour scheme, and there was none of the orthodox pink flannel and dark brown blankets one usually associates with hospitals. Every bed was fitted with a wireless set (it may, perhaps, be remembered that this was made possible by subscriptions from members of the L.T.S. a few years ago), so that patients could while away many an hour that might otherwise have proved irksome. We then visited the Children's Ward, and here, again, there was no lack of cheeriness and colour; and the wonderful collection of toys must, surely, have brought happiness to many little sufferers. Walking through the white-tiled corridors, we made our way to another section of rooms, which, on inspection, were found to be the operating theatres, anaesthetic and dressing rooms. Each room proved very interesting, and one item in the operating theatre particularly so. This was a large cabinet filled with bright shiny scissors, knives, and various other appliances of every conceivable shape and size! I am sure a finer collection of silver could not be found anywhere. It was not without a certain feeling of relief that we made our exit and passed on to the sun balcony. Here, high above the noise and dust of the streets, we rested; and, as I thought over the events of the day, I realised what a wonderful thing it was to have one's health, and how worth while it seemed to be able to say, with many others, that I had helped (even, perhaps, only in a small way) in assisting those less fortunate to regain their lost health and strength.

A. A. ROBINSON, *Langham Exchange*.

The Presentation to Mr. Valentine.

"I shall always have the thought of this evening singing in my heart." These eloquent closing words of Mr. Valentine's speech on the occasion of the presentation to him of tokens of regard by the London Telephone Service Staff on his retirement fittingly embody the spirit of the great gathering, representative of all ranks, which assembled at G.P.O. South on Friday, May 31, to do honour to our late Controller; not so much to say "good-bye" as to tender our heartiest wishes for his long enjoyment of that leisure which is the due reward of faithful service to the State.

The actual presentation was preceded by a reception and refreshments, to the accompaniment of music by the Eureka Orchestra, under the direction of Mr. A. G. Dunn. In addition, a musical programme was contributed by well-known artistes, including the Misses Beare and Worth, Captain Hemsley, and Mr. Hugh Williams—the quartette which has done such good work in providing entertainment for the inmates of the National Sanatorium at Benenden.

Mr. Napier, our new Controller, who received an enthusiastic ovation, made the presentation, the gifts including a wireless set, a writing table with

accessories, and a set of toilet requisites for Mrs. Valentine. Mr. Napier showed how closely the life of our late Controller had been associated with the Telephone industry in this country, paying many tributes to those qualities which had won Mr. Valentine the respect and regard of his staff and of his other colleagues in the service; concluding with a humorous reference to the part played by the official files in providing a constant memorial of absent colleagues by enshrining their signatures and recorded judgments for all time!

Mr. Valentine warmly and eloquently acknowledged the gifts presented to him, speaking in feeling terms of the goodwill of the staff so clearly evident in the great and representative gathering then assembled. He looked back upon his lifelong association with telephones as a happy and fortunate association; and though the time had now come to sever the old bond, he could now, in the time of leisure that was coming, answer the old calls of travel, literature and art as never before. In conclusion, Mr. Valentine again referred to the great gift of goodwill, in the eloquent phrase already quoted. Tumultuous applause and the singing of "For he's a jolly good fellow" marked the conclusion of Mr. Valentine's speech.

The presentation to our late chief is memorable for the entire absence of that element of gloom which sometimes characterises such functions. While all retirements have their element of sadness, there was something definitely inspiring in the knowledge that Mr. Valentine still looked forward—not backward—enjoying with all the zest of youth the anticipation of the alluring possibilities of his period of "extended leave." It is betraying no State secret to say that, in full accord with this spirit, Mr. Valentine, no less than his colleagues, thoroughly enjoyed the following parody sung by Captain Hemsley, to the tune of "Hearts of Oak":—

Come, cheer up, my friends, we've a part still to play,
To give the Controller a send-off to-day;
'Tis a smile we must show him, our sorrow to spurn,
For surely we know he will often return.

When he bids us adieu, we must make it quite plain,
If he would not hurt us, shun or desert us,
He'll have to come back here again and again.

The 14th of Feb., I am happy to state,
Will always be kept as a popular date;
While at Ilford the subs. have no cause to repine,
For right in their midst they retain Valentine.

And we'll smile through our tears and make light of our pain,
And give him fond greeting, at our next meeting,
And welcome him back here again and again.

Our faces are White, but we vow not to shrink;
And when he returns, may it be in the Pink.
If he'll Dive in our hearts he a Corner will find,
His Bold, Stirling worth there for ever enshrined.

And a Mantle of love he will always retain:
We miss him, we Newitt, sadly we rue it,
But wish him good fortune again and again.

And so say all of us.

P. W. H. M.

Psalm of (Auto) Life.

With apologies to Longfellow.

Tell me not in daily lectures
Of the subs. who dial O,
For it passes my conjectures
Why this System wills it so.

Well we know there's trouble brewing,
As upon their calls we wait—
When they find there's nothing doing,
Up they come with voice irate.

They are like dumb driven cattle,
When they've dialled 9 for "fife,"
So we aid them in the battle—
Isn't ours a lovely life?

If "your dial's out of order"
Is the term to be employed,
We may drive them o'er the border—
Line of reason, when annoyed.

Though we be both kind and gentle
When we bid them "dial Toll,"
If the sub. is temp'ramental,
He may still go up the pole!

Supervisors all remind us
We'll get used to it in time—
(And remonstrate if they find us
Wailing forth our woes in rhyme!)

C. A. S.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LONDON ENGINEERING DISTRICT NOTES.

The Institution of Electrical Engineers.

The Council of this Institution has awarded a Special Premium (value £10) to Capt. J. G. Hines for his paper on "The Anticipation of Demand and the Economic Selection, Provision and Lay-out of Plant (Telephone Systems)." This paper and the discussion thereon appeared in the Journal of the I.E.E. for the month of May, 1929. The economics of engineering is of vital importance and this paper should be read by all interested in the telephone industry.

Promotions.

The following promotions affecting the London Engineering District have been recently announced :—

Mr. H. W. Fulcher, Executive Engineer, to be Assistant Superintending Engineer.

Messrs. H. O. Aspinall, H. C. Gray, J. H. Watkins, and L. J. Jones, *Assistant Engineers, to be Executive Engineers.*

Mr. Aspinall remains in the London Engineering District, Mr. Gray goes to the South Midland District, Mr. Watkins to Bangor, and Mr. Jones comes to the London Engineering District.

Transfer.

Mr. W. Deane, Executive Engineer, Leicester, has been transferred to London Engineering District, where he will be in charge of the C.T.O. Section.

Fire in the Embankment Subway.

On the evening of June 6 a fire broke out beneath the Post Office cable bearers in the subway on the Thames Embankment within a short distance of the scene of the fire which occurred last year. Although the damage to the Post Office cables was not so extensive as on the previous occasion, it was sufficiently serious to cause much dislocation of telephone traffic. Twenty large junction and subscribers' cables were destroyed and also a number of smaller cables. The number of working circuits was approximately 3,000.

As soon as the subway could be entered, and the extent of the damage ascertained, the work of restoration was put in hand. By the following day arrangements had been made for the diversion of 1,200 circuits to alternative routes and the remainder of the work was well in hand. The outgoing circuits from Tandem Exchange and other leading exchanges were increased so as to enable an additional load to be carried. By these and other means it was possible to provide a satisfactory service to all exchanges by June 12, and by this date all the subscribers' lines had been restored. The speed with which restoration was effected reflects the greatest credit upon those who organised the work and upon those responsible for the actual execution. The actual cause of the fire has not yet been ascertained.

Explosions. Damage to Water and Gas Mains.

The recent happenings in London lend interest to a statement that under the auspices of the American Bureau of Standards, experiments are in hand to determine the effects of vibration and electrolysis upon ducts and pipes of various materials in different climatic and other conditions. Special attention will be directed to the possible effects of these electrolytic currents upon the materials used for the experiment.

C.T.O. NOTES.

Promotions.

Mr. J. H. Mitchell, Assistant Superintendent to Superintendent (Lower Grade), and Mr. E. J. Samuel, Overseer to Assistant Superintendent. Miss J. E. M. Nash, Assistant Supervisor to Supervisor.

Retirements.

Mr. C. A. Kindon (Superintendent Lower Grade), Mr. A. C. O'Brien (Assistant Superintendent Cable Room), Messrs. R. Comben and A. J. Kings (Overseers) and Miss E. Winsor and Messrs. H. W. Vincent, O. H. Mitchell, C. W. Ellis and A. D. Lavendar (Telegraphists).

Obituary.

We regret to learn of the death of another of our old colleagues in the person of Mr. Charles Fenton, a former Assistant Superintendent at the C.T.O. and Threadneedle Street B.O., which took place at his residence at Shanklin on April 24 last in his 75th year. Entering the old Electric and International Telegraph Company in 1868, the late Mr. Fenton was appointed in 1870 at Southampton, on the transfer of the telegraphs to the State. He was transferred to the C.T.O. in 1874 as a Second Class Telegraphist. After becoming a First Class Telegraphist, he was appointed as an Overseer and Senior Telegraphist in 1886; Second Class Assistant Superintendent in 1894, and a First Class Assistant Superintendent in 1902. He then took up duty at the Threadneedle Street B.O. until he was promoted in 1908 to the Postmastership of Jersey, retiring from that post on reaching the age limit in 1915.

Rambles.

Surrey's beauty appears to retain pride of place for office rambles. The Night Staff and the "F" Division recently tasted the delights of the county, the "Nights" exploring the woods and lanes between Claygate and Oxshott, whilst the "F" Division strollers found the hills and dales around Leatherhead and Mickleham still full of charm.

Sports.

Bowls.—The C.T.O. beat the P.O. Engineers in the Civil Service League game by 68 to 51, lost to the Admiralty 58 to 60, but won the match against the Valuation Department, Inland Revenue, by no fewer than 90 points, the scores being C.T.O. 111, Valuation Department 21.

C.T.O. Sports Meeting.—The "Centels" will hold their 15th Annual Sports Meeting and al-fresco dance on Friday, July 12, at Chiswick. The "Centels" Association invites departments to enter teams of four ladies in a 440 yards relay race, and men in a 440 yards individual handicap. Entries should be sent to Hon. Secretary, Mr. G. W. Ince, "D" Division, C.T.O. The men's entries should be accompanied by a complete A.A.A. form and 1*s.* entrance fee.

The club especially appeals to all connected with the C.T.O. and friends in other offices to note the date and support the meeting. Teas and refreshments will be available, and Leonard Coombs' Bon Accord Orchestra will be in attendance.

Cricket.—Curtis Bennett Shield, Second Round. After a drawn game with the Ministry of Labour on June 10, the "Centels" were beaten on June 17 by four wickets. Scores: First match, "Centels" 243 for 7 (W. T. Cook 118, P. Drummond 40); Ministry of Labour 263 for 8. Second match: "Centels" 168, to which the Ministry of Labour replied with 172 for 6.

The inter-Gallery match between the "Centels" and "Fortels" resulted in a win for the latter. Scores: "Fortels" 182; "Centels" 112.

Farewell Dinner to Messrs. F. W. E. Charrosin and G. J. Smith, of the Cable Room.

Friends of Messrs. F. W. E. Charrosin and G. J. Smith held a most successful function in bidding farewell to their retiring colleagues, who were made the recipients of well-deserved testimonials. The evening was concluded with music.

LONDON TELEPHONE SERVICE NOTES.

Bowls.—L.T.S.

THE Bowls Section continue their victorious career, their record up to and including the match played on the 11th June being played and won five.

The final scores in the last three games are given below :—

May	21st	...	*v.* Cavendish	...	...	...	Won by	89	shots to 38
,,	29th	...	*v.* Board of Education	...	...	,,	63	,,	52
June	11th	...	*v.* Customs & Excise	...	...	,,	60	,,	59

The game against the Customs and Excise proved to be most exciting. The Customs team is one of the best in the competition, and it was a creditable performance to overcome such a strong combination.

It is a remarkable commentary on the fighting qualities of the L.T.S. team that at every period of the game—until the final wood on the last rink was bowled—the Customs team were leading. Two rinks had completed their games when the third rink had still two ends to bowl. The score at this period was 59—56 in favour of the Customs. A two to the L.T.S. brought the figures to 59—58 and one end to go. The last wood of the game was delivered by the opposing skip with the L.T.S. apparently lying one in, and, luckily for the L.T.S., the final wood was "wrecked" by what was described as the worst wood of the evening.

The suspense was not over until it was finally proved after several measurements had been taken of the contesting woods—during which time the players were looking on with a strained look on their faces and lying about in most undignified positions—that the L.T.S. had secured the match by the sixteenth of an inch. It was a really fine game, with the Customs perhaps a little unfortunate to lose so narrowly.

THE LAST RINK, WHEN ALL STOPPED BREATHING. WHO HAS WON ?
L.T.S. v. Customs and Excise.

In the local tournament, 1st Round, Mr. Barry beat Mr. Hack by five shots. Members are requested to arrange to play off all 1st Round matches by the 25th June, and 2nd Round ties will, if possible, be disposed of by the 17th July, 1929.

The club's remaining league matches are :—

June 20th.—*v.* L.P.S.
July 22nd.—*v.* Science Museum.

* * * *

Contract Branch Notes.

The business done by the Contract Branch during the month of May resulted in a net gain of 4,189 stations as compared with 4,461 last year. This drop is disappointing, especially after the improvement in the April figures had raised our hopes, but the figures for the two months April and May, taken together, are 240 stations more than last year.

Mr. F. Squibb, Contract Officer, Class I in the Western District Office, retired from the Service under the age limit on the 15th ultimo. Mr. Squibb joined the Post Office canvassing staff in November, 1901, when the Post Office London system was in its infancy. A farewell gathering was held on the 26th ultimo, when the staff presented Mr. Squibb with a substantial cheque as a token of their esteem and good wishes for the future.

There were on the 31st May 1,323 kiosks in London—an increase of 109 since the beginning of the year. The number is increasing steadily, in spite of all the difficulties of obtaining suitable sites.

We understand that tin containers containing advertising matter are to be provided in all kiosks and call offices where the consent of the landlord or owner of the site can be obtained.

Our congratulations to Mr. C. N. Benham on his promotion to Contract Officer, Class 1.

* * * *

Contracts Cricket.

During the month of May three matches were played in the league tournament, two against the Accounts Branch, and one against the Traffic Branch. The Accounts Branch won one, and the Traffic Branch won their match, the remaining game being drawn.

Although there are still three matches to be played, it is doubtful whether it will be possible to retain the Shield, and on present indications the Accounts Branch look like recapturing the trophy.

Nevertheless the future, so far as the Contracts Branch is concerned, is particularly bright. Several new men who have only been introduced to the team this year look like developing into good players, and in the case of cricket the period of adolescence is generally longer than in most other games.

Scores in the games were as follows :—

15th May, 1929.	Accounts Branch,	129 for 7 wickets declared. Young 70.
,, ,,	Contract ,,	62 for 7 wickets. Hodgkiss 18 not out.
21st May, 1929.	Traffic ,,	99—Griffiths 5 wickets for 14.
,, ,,	Contract ,,	93
27th May, 1929.	Accounts ,,	98
,, ,,	Contract ,,	71

Post Office Sanatorium.

There was a pleasing little ceremony at the Royal Albion Hotel, Brighton, on Saturday, June 1, when the delegates representing the London Telephone Service at the 11th Conference of the Post Office Sanatorium Society assembled to do honour to Miss M. M. Worth, their constituency secretary.

Mr. E. H. Atkins, in handing to Miss Worth a handsome handbag, stated that his colleagues felt that they must show their great appreciation of the work performed for some years by their dear Secretary. Her work among their colleagues in the London Telephone Service, and also on the Board of Management of the Post Office Sanatorium Society, entailed a great deal of time and attention, and it was only fitting that she should have some tangible sign of their appreciation.

Miss Worth, who was taken completely by surprise, said she was only too pleased to do what she could at any time for her suffering colleagues, and did not regret giving up her spare time in so excellent a cause.

* * * *

L.T.S. Sports Association.

The Annual General Meeting was held in the Refreshment Room, G.P.O. South, on Friday, June 7, at 5.30 p.m.

The Chair was taken by Mr. Hugh Williams, who reported that, owing to the transfer of Mr. Beck to the District Managership of Exeter, the Association were without a Sceretary, and consequently some difficulty had been experienced in presenting an Annual Report. A brief résumé of the activities of the various sections of sport was, however, given, and the result of the year's work was considered gratifying. The Chairman reported that the Tennis Section, in addition to the annual competition for the Agnes Cox Cup, had arranged a " Singles " contest, which was now in full swing, and that Mr. Pink (Assistant Controller) had very generously offered a Cup for the winner. The Association desired to record their gratitude and appreciation of this increased and tangible interest in the L.T.S. sports movement.

It was also reported that it was desirable to form a Hockey Section, and the new Secretary, when appointed, would be requested to get into touch with the various hockey clubs with a view to forming a League next season. In this connexion the Chairman promised that he would endeavour to obtain a trophy for competition if the venture was successful. As the reports of the other sectional sports have appeared in this Journal from time to time, it was not considered necessary to refer in detail to their work.

A financial statement was then presented, and after clearing commitments for the summer sports a balance of £20 4*s*. 7*d*. would be in hand.

The election of officers was proceeded with. Owing to the retirement of the Controller, Mr. Valentine, the Presidency became vacant. The Chairman reported that he had already broached the subject to the new Controller, Mr. Napier, and was now awaiting a reply. This action was approved by the meeting.

It was proposed, seconded, and unanimously agreed that Mr. George Lewis, of the Accounts Branch (A.R.4E) be appointed Hon. General Secretary, and the Chairman was requested to write to the late Secretary, Mr. T. A. Beck, and convey the appreciation of the Association for his services during the past two years.

Mr. Hugh Williams was re-elected Chairman, and was also thanked for his interest in the Association.

A discussion then took place as to the advisability of withdrawing from the Civil Service Sports Association with the object of inviting the existing members to contribute similar sums to the L.T.S. Association, and thus create a financial basis upon which to build up a Sports Ground Fund. The Chairman strongly deprecated such action being taken, and pointed out that the C.S.S.A. were doing their utmost to provide grounds to meet the demands of its shareholders. Chiswick already served its Western members, and now Walthamstow provided accommodation for Eastern players. In due course Northern and Southern areas would be opened up, and thus London would be fairly well provided for in all districts. He further pointed out that a severance from the C.S.S.A. would place a heavy burden upon the L.T.S. Association, and to achieve anything like success an enormous capital would be required, as well as a large income. It was finally decided to refer the matter to the Executive Committee to set up a sub-committee to further discuss the matter and present a report to the next Annual General Meeting, or a special general meeting, if deemed necessary.

A proposal was then made that the Association hold a sports day. It was agreed that such an event would be welcomed, and a sub-committee would be set up to arrange the details.

The meeting then closed with a vote of thanks to the Chairman.

* * * *

Tennis Section.

The first round in the " Agnes Cox " Cup has now been completed, and the following teams are now left to play in the second round :—Hop, Clerkenwell, A.R.2, A.R.5, Trunks R.1, Tandem, A.R.1, A.R.4 (this team has played and won its second round), Fulham, Chiswick, Avenue, Ealing, Kensington, and Central.

In the Singles Competition for the " Pink " Cup, the representatives of the following Exchanges and Sections have qualified for the second round : Maryland (second round already played and won), Tottenham, Grangewood, Clerkenwell, Fulham, A.R.2, Enfield, Western, Victoria, Trunks, A.R.1, Molesey, Central R.1, and Kensington.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXVII.— MR. HUGH TOWNSHEND.

ONCE upon a time, so the legend goes, the work of the Secretary's Office was to sit still, to receive the reports of experts, and to pass judgment; when they found a decision difficult, whether by reason of indecisiveness or by lack of understanding, there were other experts to be consulted, so that in course of time, by accumulation or contradiction of testimony, every problem might be expected to solve itself. In these days the Secretary's Office plays a less dignified but possibly more useful part; and Townshend as much as any man is typical of the new order of things.

A Principal in the Telephone Branch, he is mainly employed on the trunk-line system and on overseas telephony. His work requires that the demands of a (rightly) exacting public should be satisfied, nay more, anticipated, and that the prestige of the British telephone service should be established and maintained throughout the world. It gives no time nor scope for critical aloofness; it is Townshend's way to be in on a project at the start and to carry it through to the finish. Before a project has even taken shape, he will hammer out the details with the experts, displaying not a little of the "expertise" of each; discussion is the very breath of life to him, and his frankness, his occasional provocativeness, have a way of bringing the best out of everyone with whom he discusses. For this reason he is specially fitted for international negotiations, of which many fall to his lot; he assists Sir Thomas Purves on the International Consultative Committee for Telephones. He is fortunate in having a fluent knowledge of French and German and a quick appreciation of a foreign point of view; and above all he has the faculty of paying full attention to the details of a complicated issue without ever losing sight of the underlying principles.

[Photograph by Vandyk, 41, Buckingham Palace Rd., S.W.

Of hobbies in the ordinary sense of the word he has none; he is almost superhumanly indifferent to the lures of the world, the flesh and the devil. But rumour has it that in this month of August he may be found in some obscure village in the south-west, swimming or sailing a boat.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

VII.—BY A TRAFFIC OFFICER.

[NOTE.—*The Editing Committee accepts no responsibility for the views expressed in this series of articles.*]

FROM time to time over a period of many years, but perhaps more frequently of late, statements have appeared in the press and in service journals suggesting that there is a great deal amiss with the telegraph service; that it is run at a loss; is growing unpopular, with a steadily declining traffic; that it is slow, inaccurate, and inconvenient; and that the public is critical and the staff restless. Such criticisms may not be fully justified at the present time, but probably no one associated with the telegraph service would contend that there is not room for improvement in some directions.

The decline in traffic is a well known fact. It has been attributed partly to trade depression but mainly to the competition of the telephone service, and there is at the moment every indication that the decline will continue. One might draw an analogy between the railways and motor transport competition, and then suggest that an endeavour be made to arrest the decline in, and to attract more, telegraphic traffic by introducing cheap rate facilities, and by advertising the general service widely and persistently.

In order, however, to ensure a fair measure of success one should be reasonably confident that the wares to be advertised are good and relatively cheap.

The present cost of a telegram is out of proportion to the rise in the cost of living since pre-war days, while in many quarters the speed of transmission is alleged to have deteriorated. The writer does not propose to offer any observations on the tariff except to say that, judging from the report of a recent Parliamentary Committee, the possibility of any general reduction in tariff seems out of the question. As regards speed of transmission it might be argued that the speed should be the best one can afford, and as we have been informed on the best authority that a loss of fivepence is incurred on each telegram handled, the logical conclusion would seem to be to abandon the service altogether! A service, however, that in spite of falling traffic still handles about one million telegrams a week must be maintained; and it should be common ground on the part of the public, the Department, and the staff, that what is worth doing is worth doing well. Are we really doing well from a quality of service viewpoint? On the one hand, heavy delays are alleged, while on the other hand the view seems to be that the service is "reasonably good." The writer is not impressed with the tales of the wonderful service given in the "good old days"; his own recollections are of far too many occasions when "abnormal pressure" existed, when extra points were worked, diversions freely resorted to, hundreds of blue slips waited transcription, with heavy delay at concentrators. In some respects, at any rate, there has been an improvement since those days; but a service having an appreciable number of telegrams that are not disposed of in an hour from handing-in time to delivery to the addressee still has very much scope for improvement. It has been stated that the total transit time of the average telegram is about 45 minutes; and to the average business man this must be about as comforting as to be told that the average depth of a pond is 2 feet when someone pushes him in at the 6-foot end! A much better quality of service ought to be given. There are still too many periods of "abnormal pressure" and other features previously mentioned, and an interesting fact is that this state of affairs is more pronounced on main routes—where one would expect the best service, assuming sufficient, expert, and specialised staff, ample circuit capacity, a high standard of apparatus and line stability, and an excellent output. And if difficulty and congestion occur on the main routes certain reactions are manifest on the smaller routes in the same offices.

Soon after the trade and traffic slump early in the post-war period, a fresh basis of staffing was adopted and revisions of establishments were carried out based on the average daily traffic throughout the year. Subsequently the basis was altered to the average daily traffic during the non-season period with a permissible reduction to the extent of the average percentage traffic decrease during the preceding five years. The staffing standards used in these revisions were designed to give a definite standard of service which unfortunately in practice on numerous routes—particularly on main routes—has not been attained, while the operator output appropriate to the standards has not only not been reached but has consistently remained relatively low, even in cases where the conditions would seem to be clear and straightforward.

What are the probable causes and remedies for this state of affairs? The opinion has been freely and generally expressed that instability of machine circuits and apparatus, particularly apparatus, is one of the main causes of the trouble, as it leads to disorganisation and delay; and examination of stability returns certainly indicates some ground for this view. It would appear necessary, therefore, to fix and promulgate better and definite standards of stability for the various types of apparatus, and urgently to create an organisation capable of maintaining such standards. One has an uneasy feeling that machine apparatus has, in some cases, been introduced where the staff, both on the traffic and on the engineering sides, have not had that degree of training and instruction necessary to ensure that there shall be no deterioration in the quality of service either during or subsequent to a change over. Happily, there are signs of a better appreciation of these points and the need for the adequate provision both of reserve machines and spare parts; but it is suggested, in view of the rapid extension of machine working, that in each Superintending Engineer's District there should be a responsible engineer whose prime duty would be the good maintenance of telegraph apparatus.

Inexpert staff in some cases possibly by reason of insufficient training or too small a degree of specialisation undoubtedly contributes to the present position, and it is essential that this handicap be removed. A higher standard of qualification for touch typing should be imposed generally, the existing staff being withdrawn gradually but regularly for further training where, on test, the standard cannot be attained. Concurrently, the existing conditions demand that efforts be made to introduce a real and definite specialisation on machine circuit duties—and on any other duties where such a course would be advantageous—both in regard to the rank and file and the supervising force. This pre-supposes training of the supervising force in machine systems, as distinct from operating, where their knowledge and experience may be somewhat weak, and instruction in the fundamentals of the control and disposal of traffic.

It may be well to recall that the Administration has always contended definitely that the staffing standards are reasonable and that all due allowances have been made for work incidental to operating, and for the other factors that warrant an allowance, while the staff Associations take the opposite view. A deadlock on this subject has continued for some years. Human nature scarcely permits a person to be happy at his work when suffering a grievance, real or imaginary, and while that deadlock continues it is not unreasonable to infer that full co-operation between Administration and staff is wanting in the efforts to maintain and improve the quality of service. What prevents agreement? Surely it should be possible for the two great bodies concerned to come to terms on a question of so vital importance. The writer suggests, therefore, that fresh discussions should take place between the two parties.

Stability of lines generally is not unsatisfactory, but there are cases where it is desirable to reach a better standard on those used for machine working. Our engineering colleagues ought to find means for raising the standard without much difficulty.

Non-standardisation of machine apparatus is also held to be a troublesome feature in regard to stability, but it is now a diminishing quality. With the extension of teleprinter working to circuits

carrying loads of but 200 telegrams daily, one can visualise the time when circuits will be divided into automatic multiplex, teleprinter, morse, and telephone, if, indeed, the teleprinter does not ultimately oust the first named. Will the retention of morse really be justified? If by mass production teleprinter makers could reduce appreciably the cost of that machine, it would be a good policy to extend the teleprinter field; the balance of the lightly loaded circuit traffic being disposed of by telephone. Alternatively, consideration might be given at once to the question of dealing by telephone with loads below 200 daily by adequate training of the staff and the use of typewriters for reception.

In any case. the further extension of the policy of concentration of traffic by telephone on to given centres that are also "appointed offices," and the through-switching of traffic for direct disposal between post offices in junction areas is strongly advocated, coupled with the use of typewriters for reception at those centres. Incidentally the phonogram service would benefit in speed and output.

Any pronounced general improvement in the overall transit time must involve a speedier delivery service, and it is suggested that the reintroduction of the "docket" or a similar system should be considered so far as the larger towns are concerned. There may, however, be another solution for other places. In a remarkably short time something in the nature of a vast organisation has grown on the roads of this country and possibly it may offer means for improvement in the delivery service. This organisation consists of the motor garages and petrol-filling stations. Many are "open always" and might therefore give a continuous, or at any rate, a very extended service. A large percentage are situated on main streets with ready means for handling message work. It may be convenient although not essential to conduct delivery from Post Offices; but where the load is light a change might be considered on grounds of speed and economy. The suggestion embraces express delivery, but special conditions would need setting up for M.O. work.

As regards changes that would probably be welcome to the public while tending to increase traffic, the encouragement of private wires, particularly teleprinters and telephones, without charge for clerks' services, deposit accounts without a booking fee, waiving of all telephone fees in connexion with A and C phonograms, provision of better writing accommodation at the counters, abolition of the surtax on Sundays and holidays, increase in the number of collecting offices, extension of the hours of acceptance both at night and on Sundays, and delivery at all fair-sized towns, and the provision of seasonal greeting, &c. telegram facilities, all merit consideration, in addition to a wide and persistent publicity scheme, and a bolder and more prominent indication of the location of telegraph offices.

There is a well known slogan "It pays to advertise," and there is much evidence in commercial circles that it does. Assuming that a definite improvement in the quality can be made, is it too much to ask that the telegraph service should have its chance? The very fact of advertising would go a long way to obtain better co-operation and interest of the staff that is so essential, and it would do much to dispel the impression that undoubtedly has prevailed that the decline of telegraph traffic is not a matter of great consequence. Possibly the realisation that definite efforts were being made to encourage traffic would render somewhat more acceptable the changes that have become necessary during recent years. These changes have altered the outlook and prospects of many capable members of the staff even at a relatively early age, and the writer's final word is that no avenues ought to remain unexplored in an effort to open up new outlets for these men and women, for he believes that success in this direction would lead to a very noticeable improvement in the service given by telegraph.

[This concludes the series proper of the articles by contributors invited by the Editing Committee to discuss the question "How to Improve the Telegraph Service." Two supplementary articles contributed spontaneously by an Engineering Officer and a Telephone Contract Officer will be published in succeeding issues.—ED., *T. & T.J.*]

PERSONAL TELEPHONE SERVICE.

THE object of speech is to convey some idea either to a number of persons collectively, as in a public address, or, more commonly, to some given individual.

The value of the telephone lies in the fact that its use makes it unnecessary for the speaker and the hearer to be within those few yards of one another which form the limit of the human voice.

The development of the telephone as a means of addressing a gathering is in its infancy, but its use as an established means of enabling individuals to converse is bounded by one limitation only—ability to secure the attention of the called person at a connected telephone instrument.

The *raison d'etre* of a telephone is to annihilate distance, and its value is proportional to the inconvenience, time, trouble and expense saved by its use. But a perfect telephone service is valueless to a caller who cannot secure speech with the person required, whether that person be a named individual or a member of a specified group of persons.

When the distance separating the calling person from the person required is short the cost and trouble of more than one call to secure the attention of the particular person required is not a serious matter, but as distance increases so the risk of loss and inconvenience through calls ineffective because of the non-availability of that person increases; and over long distances this risk operates in practice as a serious deterrent to the use of the telephone.

This factor has been fully recognised in America, where the distances over which business and social interests spread are so much greater than in this country, and in the first instance the normal tariff for all long-distance services there carried with it the right to name the desired person, and required the payment of the trunk fees only from the moment when the calling and called persons commenced conversation. The transatlantic service also has been worked on this basis from the outset.

Similarly, on the Continent of Europe there has long existed a system which, while not going so far as the American system to ensure the simultaneous attendance of the calling and called persons, gave, for a supplementary charge, a warning in advance to the called person that a call from a given place would shortly be made to him.

The obvious utility of and demand for a service of this type over long distances has naturally led to a consideration of its application both to the internal services in this country and to the Anglo-Continental services and by the time these lines appear the former class of service will be available, while the latter class, as indicated in the Editorial in this number, may be expected shortly.

There can be little doubt that when the full advantages of the new facilities are appreciated by the public they will be extensively employed and that they will not only be used in respect of calls which would have been made in any event, but that they will attract new traffic.

The advantages of the new type of service are by no means restricted to the guarantee that only when the required person is available will the full trunk charge be payable. There are, in fact, other benefits which in some cases may even outweigh in importance this primary advantage, and will certainly often be fully worth in themselves the supplementary charge for the "personal service."

A not uncommon form of disagreement between a subscriber and his telephone administration arises in respect of the chargeable duration of trunk calls when, as is commonly the case, private branch exchanges are involved at one or both ends of the connexion. The actual speakers, perhaps not unnaturally, tend to dispute

the official timings when they are notified that three minutes have elapsed after only one or two minutes of conversation, forgetting that under the ordinary procedure, when the call is merely booked from and to telephone numbers, i.e., between the private branch exchanges, the chargeable period commences from the time that the calling and called " stations " are placed in communication with one another, that is from the moment when answers have been received from the *premises* of the two subscribers concerned.

In these circumstances, any time taken, after the person answering the telephone has ascertained who is wanted, to secure the attention of the person required, whether by search or by extension of the call to another instrument through a private branch exchange, employs chargeable trunk line time, and it is easy to see that an appreciable chargeable period may thus elapse before effective conversation commences. A similar condition may arise at the calling station if the caller is not immediately available when the call matures.

Under the " personal call " procedure, which has now been instituted on the inland services, the chargeable time on a " personal call " will not commence to run until the calling and called persons (as distinct from their private branch exchange operators) commence conversation.

If the risk of delays in finding the called or calling persons be placed at only one minute, it follows that it will pay to book a " personal call " solely to avoid payment for this period of search in all cases where the " personal " charge is less than 33% of the trunk charge for the call, that is for all calls over about 125 miles.

When a call is made to an hotel or other place where the exact whereabouts of the called person may be difficult to trace, this period of search may greatly exceed one minute and the distance over which a personal call will become economical on this ground alone will be correspondingly reduced. This is especially the case on afternoon and evening calls, when the supplementary " personal charge " is only 6*d*.

As mentioned, the foregoing paragraph applies to the method which will be employed on the inland service. A distinction between the methods of timing " personal " calls on the inland and continental services should perhaps be explained at this point. Certain continental telephone administrations were doubtful whether the telephonist controlling an international call would be able, on account of language difficulties, to determine when the actual calling and called persons commenced conversation, and it will accordingly be found, when the conditions governing the Anglo-Continental " personal call " service are published, that they do not provide for the suspension of the moment of " timing-on " the call until the actual named persons commence to speak. In practice, however, owing to differences in the method of operating the Anglo-Continental and the inland circuits, this apparent disability will be of little importance. On the Anglo-Continental services a system of " advance calling " is in force, by which the calling and called stations receive, in addition to the original notice, a definite notification of the imminent maturity of the call itself some two or three minutes before the through connexion is actually given. This period will usually amply suffice to secure the attention of the required persons at their respective telephones, and, in consequence, the timing of the call from the moment when the two " stations " (i.e., numbers) are connected through to one another, as will be done, will normally be the same thing as timing the call from the moment when the calling and called persons are placed in communication.

In respect of both inland and continental " personal " calls the prior notice that a call is to be expected shortly from a given person or place will in many cases enable valuable time to be saved when conversation commences. The intervening period before the call actually matures may be used by the called person who has received the notification to make himself familiar with the latest phases of the matter which he may know is likely to form the subject of conversation with the calling person. Data may be gathered in readiness and time now wasted while information is sought after the call has commenced may be saved.

Under ordinary conditions a long-distance call may fail in its object to secure conversation with some desired person merely because that person is not at the station called—he may, for example, be visiting another branch of the firm or he may be at home instead of at the office. In such circumstances not only is the full trunk fee wasted, but, what may be far more serious, the call is not effective from the point of view of the caller (for it is necessary to bear in mind that the inconvenience and loss resulting from a call rendered useless because of the non-availability of the called person may be far more than the mere waste of the trunk fee involved).

Under present call conditions the telephone administration undertakes to divert a call booked to a given number to any other telephone (within a very wide area) if the telephone station originally called reports definitely to the exchange that the person required may so be reached, or the calling party may himself ask, when booking his personal call, that a second specified line shall be tried if the person required is not at the first.

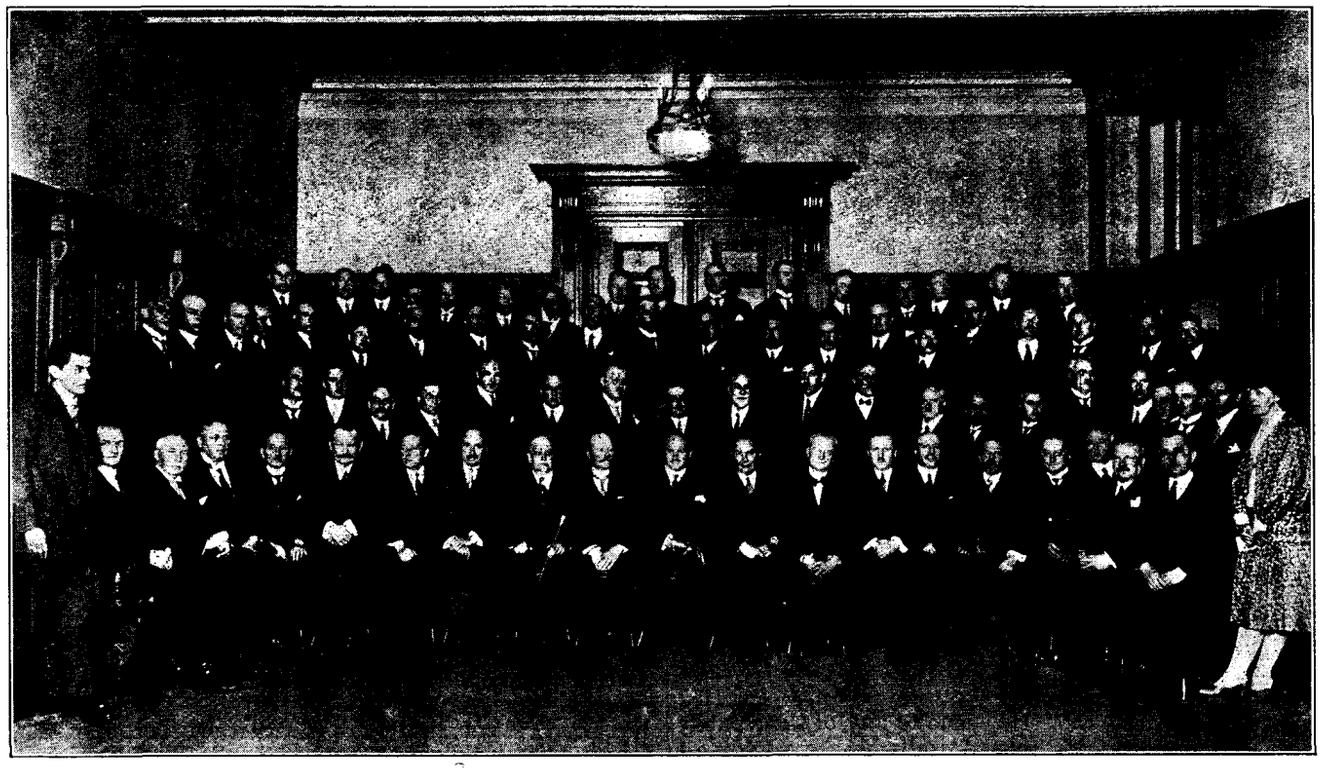
When a trunk call has been booked the calling person is normally expected to hold himself in readiness to speak when it matures. Circumstances may, however, arise in the meantime which prevent his continuous attendance at the telephone from which the call was booked. Under ordinary conditions the enforced absence of the calling person may render the call useless when it matures, but under " personal call " conditions the call can be diverted to another telephone to the vicinity of which the calling person may have gone, just as it may be diverted to the called person if necessary at the distant end. In each case all that is necessary is to instruct the local exchange accordingly. Similarly, if the calling person is called away before the call matures it will be suspended on request before it comes through if he will not be available at any telephone until he returns to the original station or reaches another one. No longer, therefore, need a caller feel tied to the vicinity of his telephone until a booked call matures. He may proceed to another branch of his business, or pay a business visit, or go home, or to his club, with the certainty (after notifying his exchange of his intended movements) that if the call matures while he is travelling it will be suspended until he reaches a telephone, to which it will duly follow him.

Yet another advantage will emerge in respect of the overseas personal call service which is to be made available shortly. English subscribers may well hesitate to book a comparatively expensive continental call if they are in doubt as to whether any effective conversation will be possible on account of language difficulties when it matures. Loss in this respect may be guarded against by the simple expedient of booking a " personal " call to " Anyone who can speak English " (or French, or German, &c., in the case of a call booked by a foreign visitor), thereby ensuring that the full trunk charge will not have to be paid uselessly if no such person is available at the distant end, and at the same time ensuring that conversation can commence as soon as the call matures if a person with this qualification is available, and avoiding the waste of line time which would result if such a person had to be found and brought to the telephone after the call had matured.

If these varied and valuable facilities are to be fully effective it is obviously essential that the subscribers concerned shall co-operate with the telephone service to the fullest degree by giving their exchanges the most complete and accurate information available at all times as to the movements of the specified persons, and this point is very carefully stressed in the circulars which are being issued to the public with regard to the service.

When the value of these many advantages of the personal call service, any one of which in certain circumstances may be worth many times the " personal charge," becomes appreciated by the general body of subscribers, it is only to be expected that the number of personal calls will increase until they form a high proportion of the long-distance traffic.

W. C. G.



THE C.C.I.T., BERLIN, JUNE, 1929.

THE C.C.I.T., BERLIN, JUNE, 1929.

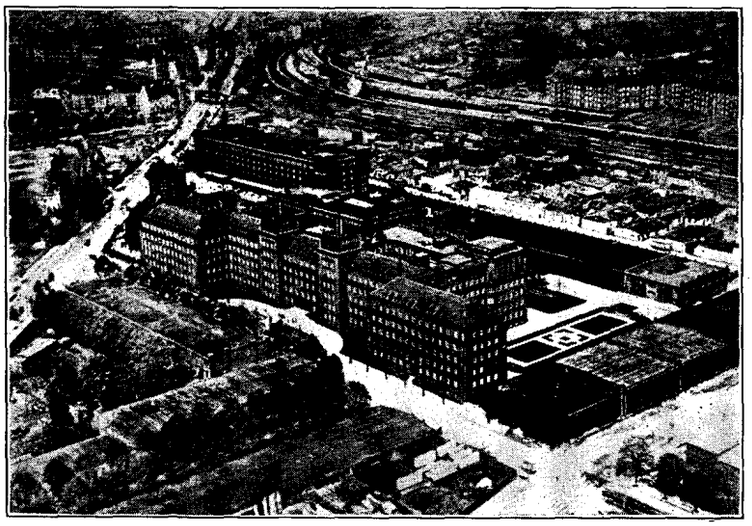
C.C.I.T. is a much more manageable expression than the long one for which it stands, viz., Comité Consultatif International des Communications Télégraphiques. It is to be noticed that the President of the Committee often has to go through this succession of French polysyllables, but the delegates use, for the sake of brevity, the initial letters at the head of these notes. This is the second meeting of the Committee, and it is the second time that the meeting has been held at Berlin. Delegations come from near and far and from all points of the compass to take part, and the preparatory work for such a conference is enormous.

On each occasion the German administration has arranged for exhibitions and demonstrations of the most up-to-date equipment of all kinds used in large telegraph offices and engineering laboratories, and the inspection of this machinery is a valuable feature of these meetings. No words of praise could be too great for the organisation and the arrangements which are set up in order to ensure smooth working and complete success from the moment the bell of the opening session is rung to the close of the last plenary meeting.

It is perhaps known that for the origins and the *raison d'etre* of the C.C.I.T. we have to look back to the year 1910. By then the traffic to Germany had outgrown the capacity of the existing circuits, and an Anglo-German Telegraph Commission was formed to investigate the technical and working conditions of the cables between England and Germany. A more competent commission could scarcely have been conceived, and its Report, bulging with oscillographs, was a monument of exhaustive research; but much more important for the future was the personal relationship that was established between the engineers and the executives of the telegraph services of the two countries. Herr Arendt, the leader of the German Delegation, then saw clearly the need of a form of co-operation between the services in studying technical questions and working arrangements concerning international telegraphy, and particularly as regards long-distance telegraphy, and largely as the result of his advocacy the last revision of the International Telegraph Convention and Service Regulations, which took place in Paris in 1925, contains the provisions for the inauguration of these meetings. Herr Arendt was the Chairman of the meeting held in November, 1926; and when he stood to address the assembly at this year's meeting the prolonged applause was a demonstration of the honour and affection in which he is held in the telegraph world.

It is natural that in a country which is governed by democratic institutions there should be rather frequent discussions as to the utility of so many conferences, commissions and committees; and even the Mother of Parliaments is often referred to by irreverent and superior persons as the Talking Shop. It is, of course, difficult to defend so much talk, but the human family is furnished with large endowments to that end, and it is not an extravagant notion that a family with common interests should meet occasionally. By a curious paradox some of the most valuable elements of committee work do not find their way into reports or resolutions; and in conferences definite interpretations of events and phenomena which are moving and developing and taking shape are more easily formed. It is in conversations of a more or less informal character that one gets to know the differences in the points of view and the practices in the various countries, and the underlying reasons for them. This experience is so common that it is scarcely necessary to labour the point.

There does not seem to be much connexion between the Old Royal Palace of Sans Souci at Potsdam and the C.C.I.T., but there is a point of some interest. From the slope on which it stands there stretches a wide vista, and on the Sunday that we were there in the summer sunshine it was richly lovely. We looked at the name carved in stone over the royal residence, and our modest acquaintance with French phrases told us that there was something wrong, but our guide gave a good explanation that is worth repeating. Frederick the Great, to say the least of it, had a sense of caustic humour, and in any event he could not have been intimately associated with Voltaire, as he was, for nearly forty years without catching some of the penetrating wit of the most potent spirit in the history of modern Europe. The King lived in the right-hand side of the palace, the Souci side, and every morning he called together his staff officers in the rooms on the left-hand side to give them instructions for the day. Frederick was convinced that he had all the cares and worries, and that



HEADQUARTERS OF TECHNICAL SERVICES OF THE GERMAN POST OFFICE, TEMPELHOF, BERLIN.

his officers did not care a jot or a little bit, and Frederick had a comma placed between the two words over the portals of his palace and it remains to this day.

It is doubtful whether in these days the German-speaking Union would quietly tolerate a foreign name to any of their public buildings; but it is impossible to convey all the associations of *Sans Souci* in a German expression, and so it also remains. Frederick the Great and all the courts and courtiers of Europe had a consuming passion for French poetry, and Frederick retained Voltaire for some enigmatical reasons, but certainly to give polish to his French verses. He paid rather much for the touch of genius, much more than is usually paid, and Paris thought it was a great joke; but the passion had spread over the whole of Europe, and to this day the French language is the language of international conferences, including, of course, the C.C.I.T. The influence of literary salons and the blue stockings has passed away, and one may well enquire what new passion has taken possession of Europe and in what form of art it is expressed and what will come of it, but these questions take us beyond our range.

At the appointed time the delegations arrived at the German Engineers' Institute and assembled in the large Conference Room, where each member's place, delegation by delegation, was furnished with a complete set of the reports and other documents which had been received from time to time in the previous months. Dr. Breisig, the President of the Conference, opened the proceedings with a warm welcome to the delegates, and in the course of his speech spoke of the work of both the Telegraph and the Telephone C.C.I. The following two paragraphs of this speech will be of special interest to the wider audience of this Journal:—

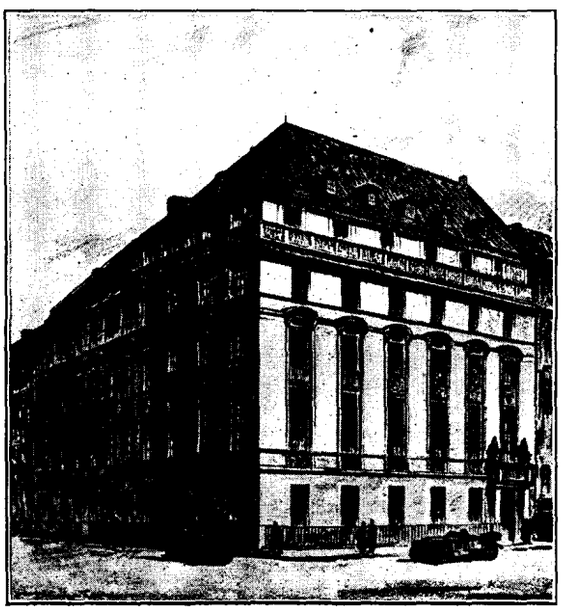
"May I mention a remarkable difference between the respective tasks of the two Committees. I do not allude to the difference in technique and the methods of working, but to the difference which results from the demands of a growing business on the telephone side and from the consequences of diminishing business on the telegraph side.

The Telephone C.C.I. is a witness of a rapid development, which in a period of only five years has created an international service which for extent and volume is almost without precedent. Certainly the facility of entering into direct communication with a correspondent in a very distant country has increased the total number of communications exchanged, but unfortunately, in spite of everything, there has been a reduction in the number of telegrams between the countries because of the possibility of direct speech. If the telegraphs continue in this way, there is a justifiable fear that the relation between income and expenditure, which is already unfavourable in most European countries, will become even more unfavourable in the course of the coming years. In view of the fact that we can never dispense with the telegraphs as a means of public communication, and of the further fact that in the United States of America they have succeeded in finding new methods of working which in connexion with ordinary public traffic give a satisfactory commercial result, telegraph officers must take care to consider the technical and organising measures that will lead to a greater efficiency of the ordinary telegraphs, and, by the example of the United States, find new ways of sharing the future prosperity of long-distance communications."

LARGE COMMITTEE ROOM, INSTITUTE OF GERMAN ENGINEERS, BERLIN.

Following the speech the Committee proceeded to the election of the Chairman, and the name of Dr. Breisig was heard from all quarters of the large hall. It was a unanimous wish from the head and heart of the body of the delegates, and when he took the chair the loud applause rang with sincerity through the building. After that the work commenced.

It would not be easy to describe the spirit that pervades this assembly, which meets with a sense of international solidarity to discuss the items on the programme. Let it not be assumed that in these discussions the difficulty which arose when the language of the human race became confused has been entirely overcome, but here, at any rate, there are no political passions to disturb the will to reach an understanding. One of the distinctive features of these conferences is the fact that they are immeasurably more concerned with the matter of a statement than with the manner



INSTITUTE OF GERMAN ENGINEERS, BERLIN.

in which it is expressed, and no audience could be more sympathetic or helpful. A new fact or a new point of view is taken up with keen attention by the delegates, and the Chairman gives it emphasis, so that, in the issue of an "avis," a proposal may be made which

takes account of the special circumstances detailed by the delegations concerned. To ignore a vital fact would almost certainly endanger a train of resolutions; and as the propositions of this Committee are intended as modifications of or additions to the International Telegraph Regulations, which have the validity of a legal instrument until the next international revision becomes operative, the C.C.I.T. cannot proceed effectively in this part of its work unless the delegations are in unanimous agreement.

We must yet again give prominence to a French name. Both of the Berlin meetings have done honour to the memory of M. Emile Baudot, in whose life work there is a veritable seed-bed of telegraph invention. At the first meeting the conference received with unanimity and acclamation the suggestion that it should honour this great inventor by defining the speed of transmission of telegraph circuits in terms of the Baud, which, parenthetically, we suppose must be pronounced as Bo in English. At the second meeting the definition of the unit was produced, but it should be understood that it is an engineering expression and not an operating standard. The conference also devoted itself to other matters relating to the Baudot multiplex; but the "avis" respecting these and other items that were on the programme have not yet gone through the official channels of the International Bureau, and it is therefore too early to write about them.

H. B.

TELEGRAPHIC MEMORABILIA.

THERE are not a few matters with which one would wish to place on record in these columns as having considerable interest to the Telegraph craft, and the first of these refers to the strides made with International Telephony.

It is something more than rumour which informs us that there are proposals on foot to lay further telephone cables between this country and the Continent—France and/or Belgium, probably.

One has not had far to seek for confirmation of such extensions, or if not exactly "confirmation," certainly strong circumstantial evidence that would surely give sanction to the increased expenditure involved.

My figures are not exactly official, but it is no secret that the increase in the number of international telephone calls (inward and outward) for Great Britain for the 12 months terminating on Mar. 31 of this year shows an advance of between 30 and 40% on the figures for the corresponding period of 1927-28. To effect this increase the actual number cannot be many short of the high-water mark of seven figures. This is, of course, a mere "flea-bite in the ocean," as Mrs. Malaprop would have said, but the figures are remarkable, and are likely to prove so for some time to come, before their rate of increase steadies down.

It is evident, without becoming an alarmist, that the Anglo-Continental telegraph services, cable and radio alike, will ere long begin to feel the pressure of their new competitor. It will not, however, be forgotten that long-distance telephony to a very considerable extent creates its own traffic, providing as it does facilities of which the telegraphs are incapable so far as the general public is concerned. If, however, the telegraph administrations concerned are able to give practically a no-delay service over the international telegraph circuits, as the gradually improving electrical conditions of these circuits should more and more render possible, and if, in addition, the problem of "quick delivery" is also earnestly tackled there should be no disheartened telegraphists in mourning over the "competition of the 'phones."

That the commercial world has been somewhat disturbed by the new telegraph regulations which come into force on Oct. 1 next was recently made manifest at the World's Trade Congress held in Amsterdam in the early part of last month, under the presidency of M. R. du Moschr. Signor Alberto Pinello, of the International Chamber of Commerce. The Congress represented a number of trade and financial groups covering the more influential business centres of the world.

Speaking at some length on the International Telegraph Service, M. Edouard Dumoulin, after referring to the discussions at previous conferences regarding five-letter code words, explained what would be the position of users of international telegraph systems after the end of September next, and showed the best use that could be made of the new regulations. He had apparently some misgivings of the workability of the new arrangements, as had others of the business delegates, but M. Dumoulin expressed the hope that the various administrations concerned would carefully calculate the use made of the respective categories of code words and the financial result of the new rules. The distinguished speaker also suggested that *all extensive users of the telegraphs should take note of their personal experiences and from time to time report such to their respective national committee.*

Telegraph administrations should therefore be well prepared to hear more of this matter!

The Indian correspondent of the *Electrical Review* states that the latest report of the Indian Posts and Telegraphs Department shows progress in the development of wireless installations. The new receiving and direction-finding station near Malir (Karachi) has been completed and tested under working conditions. In conjunction with the remodelled transmitting station at Karachi, it will be used for civil aviation purposes as well as for communication with ships. For both purposes arrangements have been made for the operation of transmitting sets at Karachi by remote control from Malir. At the inland stations the new continuous-wave transmitting sets at Allahabad, Lahore, Quetta, Peshawar and Nagpore have been completed and similar work at Mhow is in progress. At the Peshawar telegraph office a new receiving installation has been installed and tested, with satisfactory results. A new wireless station has been constructed at Kumaran Island, in the Red Sea, principally for communication with Aden—which comes under the administration of India. The aerial systems at Allahabad, Lahore and Quetta have been completely remodelled to suit new continuous-wave transmitting sets.

Personal.—I have recently had the pleasure and privilege of reading certain of the newest portions of Mr. Herbert's Telegraphy, 1929 edition, which will be ready for publication early in September, in time for the Technical Classes, Session 1929-30. I would strongly advise all intending students who wish to be well up-to-date in the technique of both Multiplex and Stop-Start to first see a copy of the new Herbert before deciding upon a text-book for the coming season.

Promotions.—Though to be mentioned elsewhere, one cannot permit the promotion of Miss J. E. M. Nash from Asst.-Supervisor to Supervisor to pass without at least one word of satisfaction that opportunity has been afforded for recognising efficiency. Not the least of the natural aids to that efficiency in supervision has been a cheerful disposition. To the Misses M. L. Toothill and A. J. McCarthy, on account of similar advances in the service, also felicitations, as also to Mr. J. H. Mitchell, now Supt., Lower Grade, and Mr. E. J. Samuel, now Asst. Supt.

Echoes from the Retired List.—It is with much pleasure that one is able to report steady progress in the condition of Mr. Adam Gordon, now in the closing days of his seventieth year. Those who may recall Mr. H. W. Brookman, who retired early from the C.T.O., in 1902, with the rank of Higher Grade Superintendent, will be more than interested to learn that "Harry" completed his ninetieth year last month. Mr. Brookman's telegraph service dates back to the "old Magnetic" of the early fifties.

Laughter and Tears.—Laughter and tears are meant to turn the wheels of the same machinery of sensibility; one is wind-power and the other water-power; that is all.—*Oliver W. Holmes.*

J. J. T.

HENDON R.A.F. DISPLAY.

YOU set off originally for Hendon with the firm intention of studying at first hand communication problems relating to air operation, ground organisation, speech amplifying and distribution equipment, and the like. You may perhaps go with the idea of studying other features, technical or not, as the case may be. It is better, however, to go with no such intentions unless you happen to be a hardened visitor to this display and inured to a continuity of thrill and interest sufficient to subdue even the most insistent conscience. In the present instance the fact that this was a first visit is therefore stated and not pleaded.

In service displays on land or water organisation usually reaches a very high standard of efficiency. In this display, where the consequences of a slight weakness at any one of a hundred points would in all probability be serious, the successful presentation of such a varied programme in the time and space available is in itself sufficient tribute to the care and thoroughness bestowed by all concerned.

Months back the passing observer might have noticed the erection of tents in one corner of the aerodrome followed shortly afterwards by signs of occupation. A certain indefinable air of life and interest attaches itself gradually to what was previously rather a desolate waste. Rolls of light fencing appear in a night to be erected later in the form of enclosures ; quantities of aeroplane wings are deposited near the site of last year's bombed village, and imagination is rife as to the form which this year's objective will eventually take. The construction of stands commences ; signal poles carrying air lines intrude themselves on the landscape together with boards carrying enclosure notices and directions ; large white lettering indicates to passing railway travellers the date of the display. And so the long preparation progresses, and the aircraft wings, supported by a wooden framework, gradually assume the outline of a quay, with fort and buildings, and a ship alongside—a somewhat supercilious ship, it may be remarked, with a tip-tilted nose and, no doubt, together with its mobile sisters to appear later, complete with mobile (but nevertheless still) waves, the cause of many facetious remarks being levelled at the designer.

At last the date of the display is at hand. The accommodation and enclosures approach completion. Surrounding fields show signs of impending occupation by invading crowds. The quay, fort, buildings and ship are complete and possess a remarkable air of solid reality, to which, from a distance, the surrounding waves give added effect. The aeroplane park is an orderly mass of many kinds of aircraft uncountable in the network of struts, wings and landing chassis.

The rehearsal is finished—will it keep fine ?

It is fine—a glorious day, but hot. So, unfortunately, are some of the refreshments which one hoped would prove otherwise ! Half London must be here, judging by the crowd, and have got very hot in coming, whichever the route chosen. Event follows event with accurately-timed precision, and to the continuous roar of powerful engines. Should it be miles per gallon, or gallons per mile with some of these ?

The aeroplane park is out of sight owing to the formation of the ground, but an endless stream of aircraft comes up the hill and takes off as the different events fall due. How nice it is in the cooler air stream from the propellers when an aeroplane swings into position. Who wouldn't wish to be aloft on a hot day like this ? How easily the twin-engined craft manœuvre on the ground with their port and starboard engines and how hot the port and starboard attendants must be running along with, and swinging into position, the smaller and singled-engined craft. Mr. Henry Ford's ubiquitous first-born is here in yet another application—running round and starting engines.

It is all very wonderful and far too absorbing to permit of any continuous and successive recollections being formed of the various items. A race, then some aerobatics. A " Moth " appears loitering, one might almost say, with intent, &c., it looks so suspiciously casual ; or does it remind one more of a policeman standing at a street corner on the look-out for small boys ? Another race. An artillery observation event in which the first air fight on the programme draws one's attention from an endeavour to solve the problem of ranges, shell burst, and clock-hour direction. A third race—it is difficult to appreciate these races fully, and far too hot and too much trouble with the attraction of more aerobatics looming ahead on the programme. How attractive the red smoke looks against the sky and how well it indicates the path of the aircraft ! Why doesn't the blue machine use blue smoke to match ?

Now for the balloon chasing ! What tiny balloons—how do they manage to hit them ? This chap's better than the one before, he got two that time. That's pretty good, that crossing over of those squadrons ; and that snake business ; nasty thing to see coming home early in the morning, though ! More aerobatics. I say, did you see those big fellows take off just now with the parachutists standing on the wings ? They're over there now. The parachutists must be having a cool ride ; they had to hold tight when they went up. Here they are now ! Look at that man sitting on the other's parachute !

Flying boats ! Wonder where they've come from ? Pretty well on time anyway, and they must have come from some way off.

Attacking an encampment ; air combat ; message picking up ; flight aerobatics with marvellous upside-down flying and even manœuvring in this position. It is difficult at times to hear the announcements with the noise of the engines, especially while the big sinister-looking night bombers are forming up.

The crazy flying is almost unbelievable, but forms a kind of light relief preceding the last three events of which the finale provides a realistic thrill unsurpassable to the ordinary mind. A fitting conclusion to an unforgettable afternoon despite the efficiency (if not the effectiveness) of the smoke screen.

Afterwards, with the returning recollection of an original intention, comes the realisation of an opportunity for an interesting study missed. But not, perhaps, regretted, in view of the compensations ?

THE INAUGURATION OF THE TELEPHONE SERVICE BETWEEN THE ISLE OF MAN AND ENGLAND.

THE inhabitants of the Island have long desired to have telephonic communication with the mainland, and the liveliest interest was manifested in the progress of the engineering work involved. An address on this subject to the Rotary Club was reported verbatim by the local press, and the operations of the cable ship received equally close attention. There was, too, a very generally expressed opinion that the advent of the telephone to the mainland would inaugurate a new era in the history of the Island. Such importance was attached to the event that it was suggested on all hands that the Lieutenant-Governor of the Island should mark the occasion by making the first call to the new Postmaster-General, and that the Mayor of Douglas should similarly exchange greetings with the Chief Magistrates, the Lords Mayor of Manchester and Liverpool, and the Mayor of Bolton. This programme was duly carried out.

For the first time in its history a telephone was introduced into the Tynwald Court, and at the appointed time on June 29 the Lieutenant-Governor, Sir Claude Hill, suspended the proceedings of the Manx Parliament in order to speak to the Postmaster-General in London from a telephone placed on his desk.

In his message to the Postmaster-General Sir Claude Hill emphasised the advantages which the new service provided in its benefit to commerce and to business men staying in the island. The enterprise of the Post Office had removed an adverse factor militating against the progress and prosperity of the Island. The Postmaster-General, in replying, expressed his pleasure in conveying his greetings by means of the human voice. He said that the Post Office Engineers had, for many years, been working in the midst of great difficulties to accomplish this achievement, and he expressed the hope that the new service would still further increase the prosperity of the Island. He added that the Isle of Man occupied an important position between England and Northern Ireland, and now that matters had reached the stage on which they were congratulating themselves to-day, it was confidently hoped that in the next few weeks it would be possible to extend the new cable service to Belfast. The Postmaster-General then declared the new service open.

The call by the Lieutenant-Governor to the Postmaster-General was immediately followed by calls from the Mayor of Douglas to the Lord Mayor of Liverpool, the Lord Mayor of Manchester, and the Mayor of Bolton. During the day many other calls by the leading newspapers were made to the Mayor of Douglas and to other Civic officials. A noteworthy feature of these calls was the universal satisfaction which users expressed with the volume and clarity of the speech over the new circuits—to quote the *Isle of Man Times*, "The transmission was wonderful."

The Service was opened for Commercial and Private messages at 1.0 p.m., and the volume of traffic was remarkable. During the first day 252 calls were effected between 1.0 p.m. and midnight, and each call had perforce to be limited to 3 minutes. Here it will by no means be out of place to offer a word of praise to the operators for the expeditious manner in which they effected the connexions during a period of remarkable pressure.

The record of the first public call on the new service belongs to Mr. George Brown, the well-known Editor of the *Isle of Man Times*.

It is difficult to convey in mere words the intense satisfaction which the opening of this new telephone service has given to the residents of the Island.

AN AMERICAN TELEGRAPH AND TELEPHONE JOURNAL.

FOR more than a decade the readers of our own professional *Journal* have had the privilege of perusing quotations from newspapers and periodicals of nearly every civilised nation, and among those which have most frequently appeared the *Telegraph and Telephone Age* must surely have a place.

The British *Journal* is in years a mere child of some fourteen summers against the forty-seven years now completing of the *Age*.

Some of our readers are perhaps curious to know how the American publication compares with our own, and without making invidious comparisons, one may at once say frankly that from a British point of view—probably prejudiced—give us the make-up of the London Post-Office production.

Quite naturally the fact that "the regeneration of the Spanish telephone service was accomplished by private enterprise," is duly emphasised, and one could not expect less. Certainly one would hardly expect, at this distant date, to find any reference to instances where the reverse process also gave a regenerative result.

The "Editorial Comments" are much briefer than our own, and at times hardly justify the title just quoted, as the "comments" are frequently simply special items of news. For example, in the mid-June issue now before me, there are four interesting paragraphs, one an appeal for help for the wife of a deceased telegrapher, which takes up half the essential space; about one hundred words describing how the telephone was laid on to President Hoover's Fishing Camp; the third refers to the celebration of the fiftieth anniversary of Edison's incandescent lamp at Atlantic City, where, on May 31, a "Light Festival" was held in honour of the great inventor and also of the seventy-fifth birthday of Atlantic City itself.

Elsewhere in the same issue three columns are also devoted to the same subject which scarcely strikes one as relevant to telegraphy and telephony. However, one's pen does stray out into side-lines at times, and as the Editor's comments write specifically of the "fiftieth anniversary of Edison's lamp," though the "Light Festival" is maintained as a celebration of "the *discovery* of the incandescent electric light by Thomas A Edison," we are sure that our American friends will permit us to read "Swan" for "Edison" so far as being first in the field.

One "comment," that on the British merger, may surprise our readers. The leaderette reads: "The consolidation of the British cable and radio interests is a serious challenge to the radio supremacy of the United States, *and of more importance to our country than oil or merchant marine at the moment.*" It further quotes the words of the President of the Radio Corporation of America, General J. G. Harbord, who is reported to have added: "Great Britain being the great cable-controlling power of our planet."

The *Age* is catholic in its tastes, and in its page of "Mighty Truths of Wisdom from some of our best Philosophers," Sir Wilfred T. Grenfell, G. K. Chesterton, Wanamaker, Steele, Gustav Davidson, Shakespeare, Byron and Einstein are all freely quoted.

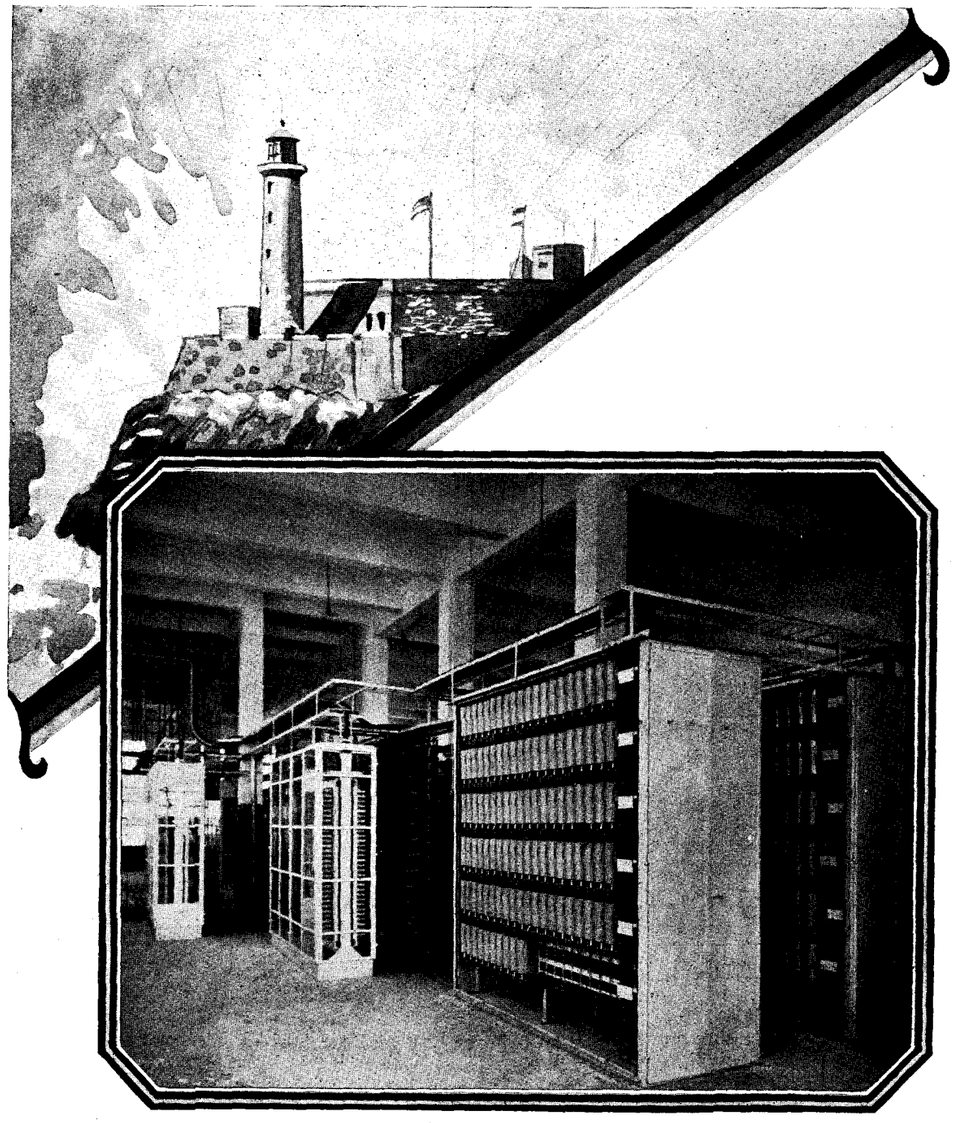
In contrast, there is another regular feature, viz., "Springtime Samples of the Gentle Jokesmith's Art of Mirthfulness," which is perhaps not so appealing as probably might prove to be the case in that of our own journal, on its lighter side, and after crossing the Atlantic!

Technical articles appear from time to time, and those at present running on Printing Telegraphs are excellently illustrated with some of the clearest diagrams it has been my joy to follow, but so far as I can gather—this for the solace and support of our own journal's Committee—nothing has yet appeared to equal those on the Automatic System in our columns.

With true business alertness every slightest item regarding telegraphs or telephones is recorded, and perhaps even at this late hour it might prove useful to mention the "Vacation" or "Holiday" telegraph services at "road garages," "filling stations," "air ports" and "refreshment stalls" on all main roads, where facilities are afforded for wiring home one's automobile progress morning, noon and night with such standard phrases as "old bus did 44 on toughest hills," "500 miles and not a flat," &c., &c.

The *Age* is American in the best sense of the word, as we trust that our *Journal* appears as British to the eyes of our cousins in the West.

J. J. T.

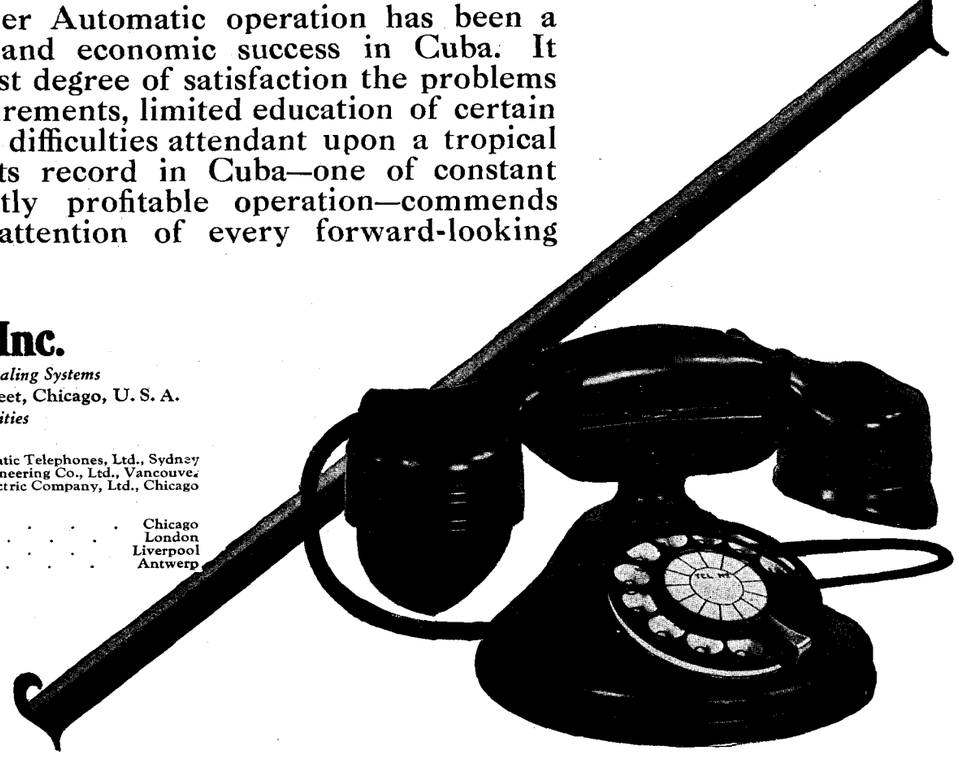


This view shows some of the Strowger Automatic telephone equipment in the Principe Office switchroom in Havana. Principe Office is one of the eight large Strowger Automatic offices now in operation in the Havana area.

A Record of Successful Operation in Cuba

SEVENTEEN years ago the first Strowger Automatic telephone was installed in Havana, Cuba. To-day there are over 45,000 Strowger Automatic telephones in use in Havana alone, and over 10,000 more stations all rendering the same modern telephone service in seven other cities of the island.

From the first, Strowger Automatic operation has been a pronounced technical and economic success in Cuba. It has met with the highest degree of satisfaction the problems of mixed language requirements, limited education of certain telephone users and the difficulties attendant upon a tropical and humid climate. Its record in Cuba—one of constant growth and consistently profitable operation—commends itself to the serious attention of every forward-looking telephone executive.



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STROWGER AUTOMATIC

The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. AUGUST, 1929. No. 173.

TALKING TO PEOPLE ABROAD—AND AT HOME.

IN our issue of November last year we devoted some space to the question of a "Personal Call" service. The introduction of this additional facility on the longer telephone routes of Europe has for some time been a burning question; and we mentioned last winter our hope that the existing efficient consultative machinery through the medium of the "C.C.I." would enable the obstacles standing in the way to be successfully surmounted.

This hope has now been realised. The whole matter was thoroughly thrashed out by a committee of "C.C.I." rapporteurs who met at Copenhagen in April last and who succeeded in overcoming the difficulties inherent in framing satisfactory operating rules for the working of a "Personal Call" service over the complex network of telephone routes connecting the polyglot and diverse national systems of Europe. The rapporteurs' proposals were discussed at the annual full meeting of the C.C.I. held at Berlin in June and were adopted, in the usual form of an "avis," issued by the "C.C.I." to all the countries represented on it, recommending them to introduce the "personal call" in their international services with effect from Oct. 1, 1929. (Incidentally, this meeting was of special interest in that for the first time some, though not yet all, of the telephone administrations of North America were represented at it by delegates with full "C.C.I." membership and rights.)

The "C.C.I." is, of course, a purely advisory body, and its recommendations do not take effect unless and until they are formally adopted by the telephone administrations of the countries concerned; but we understand that most of the European countries have already notified their intention of taking the advice of the "C.C.I." in this matter, so that the general introduction of the "personal call" into Europe, with all its essential advantages for the telephone-using public, will within a few weeks' time be an accomplished fact.

We venture to congratulate the "C.C.I." on a characteristic piece of good work; and at the same time to assure those administrations which have, in the interests of efficiency, faced the trouble incidental to modifying their operating procedure on a large scale and in important particulars, of our conviction that their decision will be highly appreciated by the rapidly growing section of the European community which uses the international telephone service.

We may remind our readers that the object of the "personal call" is to meet the growing demand by users of the telephone service, when they make an expensive long-distance call, for help in two ways; first, they ask for an insurance, in return for a reasonable premium in the form of a supplementary "personal charge," against the risk of the person they want to talk to not being at his telephone when the call goes through; secondly, they want help from the telephone administrations in finding the person wanted and getting him to the telephone to receive their call. The need for this insurance and help is, of course, the greater the more expensive the call, and for this reason the "personal call" service was made fully available over the transatlantic telephone route from the outset. In the European international services the need of the public in both respects will be met when the new "C.C.I." recommendations come into force in October; and the question has arisen of meeting it also on the inland trunk routes of this country.

As our British readers are by now aware, it was decided to introduce the "personal call" facility throughout the British inland trunk and toll service, with effect from Aug. 1; and when this number of the *Journal* is published the service will be in operation. It has been found possible to offer the "personal call" between any two places in this country (however distant) in the afternoon (after 2 p.m.) and throughout the evening and night hours, when the lines are, generally speaking, less heavily loaded than in the morning, at the low additional charge of 6*d*. During the morning hours (7 a.m. to 2 p.m.) a somewhat higher "personal charge," varying according to distance, is payable on inland personal calls. The possibility of ringing up a business associate or personal friend anywhere in the country at any time in the afternoon or evening with the certainty, not only that he will be found and brought to the telephone if possible, but that if he cannot be found no liability will have been incurred beyond the almost nominal "personal charge" of 6*d*., should appeal to both business men and residential subscribers.

A GERMAN VIEW OF AMERICAN TRUNK RATES.

THE May issue of *Europäischer Fernsprechdienst* contains a very well informed article comparing the rates for inland trunk telephone service in the United States and in Germany. The writer certainly says: "the trunk service offered by the American Telephone and Telegraph Company is as a rule to be characterised shortly by two words: Good and dear," but he is fully alive to the fact that the two services are not comparable and that you cannot effectively compare rates in two countries simply by converting the charges in one country into the currency of the other, and then, without taking the difference of purchasing power into consideration, proceeding to draw false conclusions. He admits that it might be claimed that in order to obtain as rapid trunk communication in Europe as is normally afforded in America, it would be necessary for a subscriber to book his call as "urgent," and to pay those supplementary "urgent" charges to which many European administrations still cling, and which would bring the cost to the subscriber to a figure in excess of the American charge.

With the conclusions drawn by the writer in his final paragraphs, however, we are inclined to join issue. He says: "If there actually existed an economic requirement for trunk telephone calls (in Germany) to be completed immediately after booking as in America—a condition which is certainly worth striving after, if the costs in connexion therewith be kept within tolerable limits—then much greater use would be made of the 'urgent' call than actually happens." He then gives a table showing that in five years the percentage of "urgent" calls in Germany has fallen from 8.7 to 2.2 in the case of inland calls, and from 23.3 to 4.7% in the case of foreign calls.

But it is surely one thing to fix fairly high trunk rates (with no alternative lower ones) and offer the subscriber a very high-grade and almost instantaneous service in exchange for them, and quite another thing to offer the subscriber a *fairly* rapid trunk service at low rates, and then ask him to pay treble charges if he wants a *really* rapid call. He is obviously not going to pay the threefold charge unless his need is very pressing. It is a well-known fact that the great improvement in the European trunk services, which has been going on continuously during recent years, has largely restricted the scope of the "urgent" service, and is the natural and explicable cause of the steady decline in its use. But that does not, to our mind, prove that there exists no demand in Germany for rapid trunk service. It may prove that the average subscriber prefers to pay the normal rate for a trunk call which is subject to 20 or 30 minutes delay rather than pay treble that rate for an instantaneous call; but it throws little light on the question whether he might not prefer to pay a higher ordinary rate for a trunk service normally as rapid and reliable as that given in America. If the proposal to reduce the international continental "urgent" rate from thrice to twice the ordinary rate, which is to be discussed by the C.C.I. next year, is adopted, experience of the use of an urgent service at the lower charge may throw some light on the real issue, which is admittedly a difficult one.

HIC ET UBIQUE.

MR. S. P. VIANT, J.P., M.P. for West Willesden, has been appointed Assistant Postmaster-General.

We heartily congratulate Mr. M. C. Pink on his appointment to the post of Deputy Controller, London Telephone Service, and Mr. H. Dive to that of Assistant Controller. We also congratulate Mr. G. T. Archibald on his promotion to the Assistant Controllership of the C.T.O., and Mr. F. Riley on his appointment as Inspector of Traffic, Secretary's Office. All these officers are well known to our readers as fairly regular contributors to the *Journal*.

The Geschäftsbericht for 1928 of the Austrian Postal and Telegraph Administration shows a remarkable development of the Austrian telephone system during that year. The total number of telephone stations has increased from 165,613 to 209,470, whilst in Vienna there is an increase from 105,420 to 140,759. This raises Vienna from the 30th to the 21st place in the list of cities with over 100,000 telephones.

Another continent is now in telephonic communication with Great Britain. Telephone service was opened between London and Buenos Aires on July 22. The hours of service vary according to the season, but at the outset are restricted to the period from 5.30 p.m. to 9 p.m. For the present, subscribers in Buenos Aires have to be called by the Argentine officials to a special public call office in order to receive calls from this country, and it is necessary, therefore, for subscribers in this country, when booking a call to Buenos Aires, to give the usual postal address of the person required, in addition to his name and telephone number.

The charge for a call to Buenos Aires will be £6 9*s*. for the first three minutes and £2 3*s*. for each minute or portion of a minute thereafter.

It is now possible to give data of the telephone development of the 5 largest telephone using countries at the end of 1928. The figures are as follows:—

United States ...	19,341,000
Germany ...	2,950,430
Great Britain ...	1,759,686
Canada	1,341,219
France	965,519

A correspondent sent us the following cutting which he entitles "A match for the telephone":—

It is reported that the Swedish American Match Trust, which recently obtained a match monopoly in Jugo-Slavia by making a loan to the Government of 30,000,000 dollars, has now offered an additional loan for an exclusive contract to rehabilitate the country's telephone and telegraph systems. If the offer is accepted, Jugo-Slavia will join the growing list of European countries that have entrusted their State telephone and telegraph services to private, or semi-private, bodies to be run on business lines, with a responsibility to the Government to provide an efficient and ample service.

The growing list—a very slowly growing list, we may remark—is confined to countries which were, telephonically speaking, extremely backward. Even in one of these, Greece, the transfer, according to our latest information, hangs fire.

We have received the annual report of the Post and Telegraphs Department of the Federated Malay States. We find that here, as in Europe, there is a decrease in telegraph traffic (10.2% for the year), whilst telephone traffic increased by 5.3%. The number of subscribers' lines is 4,534, with 2,177 extensions, &c., a total of 6,711 stations if we include some bell and alarm circuits not shown separately.

A gentleman writes to the *Evening Standard* saying "it would be interesting if an actuary or accountant could arrive at the number of wasted hours a day that are caused by telephone delays, wrong numbers, &c." But would it? For what could it be worth, no matter how many actuarial titles, honours and degrees

soever the computed might boast. Interesting also would be computations and conjectures as to the loss of time due to traffic blocks, train delays, heat waves, cold waves, permanent waves, brain waves, and other undulatory distractions. But more interesting still would be the estimates of the immensities of time saved by trains, motor vehicles, telephones, &c., despite inherent and human drawbacks.

The silly season has provided some paragraphs about Mr. Zzyz of New York. A Mr. Zzyn it appears recently enjoyed the enviable distinction of being the last entry in the New York telephone directory. This advertising advantage was snatched from him by Mr. Zzyk, who changed his name by deed poll to Zzyx in order to get behind him. The story goes that Zzyx has been deprived of pride of (last) place by Zzyz. This the *Daily Herald* rashly describes as an unbeatable name. But in 1930 the Z Z Z Association may come along, to be beaten in 1931 by the Z Z Z Company, and in 1932 by the Z Z Z Corporation. 1933 a firm with four capital Z's may appear and the game would then begin again *da capo*.

The University of London has, at the instance of the Institute of Public Administration, established a Diploma in that subject. The first examination was held in July, and amongst the five successful competitors were two Civil Servants, one of whom is Mr. J. T. E. A. Waddell, B.A., a Clerical Officer in the London Telephone Service and an Associate of the Institute of Public Administration.

We congratulate Mr. Waddell very heartily upon the distinction he has won.

We regret that owing to pressure on our space several interesting articles are held over, and some personal paragraphs.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at May 31, 1929, was 1,775,870, representing an increase of 13,246 on the total at the end of the previous month.

The growth for the month is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at May 31	634,479	1,141,391
Net increase for month	3,998	9,248
Residence Rate Subscribers—		
Total	152,847	240,449
Net increase	1,298	2,214
Call Office Stations (including Kiosks)—		
Total	5,626	20,595
Net increase	39	242
Kiosks—		
Total	1,323	5,233
Net increase	36	135
Rural Party Line Stations—		
Total	—	10,523
Net increase	—	81
Rural Railway Stations connected with Exchange System—		
Total	17	1,134
Net increase	—	23

Further progress was made during the month of June with the development of the local exchange system. New exchanges opened include the following :—

PROVINCES—Ashford (Kent) ; Berkhamsted.
Aughnacloy, Ampleforth, Barrhill, Crucorney, Dunsop Bridge, Ellastone, Offton, Pipegate (rural automatics) ;

and among the more important exchanges extended were :—

PROVINCES—Exeter (automatic), Failsworth, Horsforth.

During the month the following additions to the main underground system were completed and brought into use :—

Blackpool—Port Erin—Douglas (I. of Man) cable.

while 70 new overhead trunk circuits were completed, and 81 additional circuits were provided by means of spare wires in underground cables.

THE TELEGRAPH SERVICE IN 1950.

BY JAMES J. TYRRELL.

(*Continued from p.* 206.)

We can admit frankly that, for very short distances, the telephone will eventually oust the telegraphs. Road and air transport will also be competitors, as we have seen, but the Inland Telegraphs of this country will always be an essential part of the long-distance telegraphs which have their termini here.

It must not be forgotten that the Inland Telegraph Service is the telegraph distributing organisation for the British Isles. Upon this organisation every submarine telegraph cable system, and every wireless communication with Europe, Asia, Africa, America, and Australasia, as well as every ship-to-shore system, depends for the primary collection of this traffic and its ultimate delivery in these islands.

It is an indispensable service for these purposes alone, and the question of whether the Government receives an adequate amount in terminal charges for the services rendered may possibly be one which will one day receive examination. Yet, however much this traffic may vary from time to time, it will demand from our own Administration nothing less than an intensively accelerated delivery. It this be not forthcoming, then there will be justifiable cries from the Press and public that the Post Office is apparently not co-operating in making the Empire services a success, possibly a clamour for private enterprise.

But no matter who controls in the future, State or corporation, the telegraphs, to hold their own, will be compelled to accelerate, and of this I am also certain, that whether delay occurs to urgent, ordinary, deferred or even week-end traffic, the pressure for less and less transit time will continue increasingly.

Therefore, I repeat, whoever controls in the near future will be compelled to make radical changes amounting almost to a revolution in the industry, if public confidence is to prove wholehearted.

Reorganisation will mean money, and certainly not less than a million or two must be spent in reorganising, not so much the staff as the machinery.

Cheaper beam and cable rates will add materially to the traffic passing over the inland lines. Private enterprise and its sponsors have promised better results than, they say, a State service can give, and from their own point of view they will be fully justified in throwing the onus of every minute of delay possible upon the Government handling. The successes of the new private interests will have a good Press ; any failure on the part of the State service will also have Press notice ! It is also not difficult to forecast an increase in correspondence, with its concomitant expenditure at Headquarters and elsewhere. One cannot sufficiently emphasise, too, the great need in the coming years for the highest manipulative efficiency plus a zero fault-standard for apparatus. Any hope that the coming years are likely to yield cheaper labour, either in the instrument room or workshop, may be dismissed. You will need your best everywhere, and it must be paid for.

The next 20 years will see the continued and extending use of typewriter keyboard telegraph apparatus on all, if not nearly all, circuits, whether they be simplex, duplex, or multiplex or multiplex-duplex, wire or wireless.

By 1950 an international keyboard lay-out may have been agreed upon as one was tentatively settled in 1926 at Berlin.

The problem of speedy delivery of telegrams will be further accentuated in the next few years, by the trend of business to come south and to surround the metropolis in ever-extending circles. The solution of the problem in crowded areas will, however, not be found in hand-delivery. It may not yet be admitted, but it ultimately will be agreed, that there is a better means than the "walks" system. It will also be further agreed that any attempt to speed-up the pace of boy messengers through the ever-increasing dangers of modern street traffic would be highly undesirable, if not reprehensible.

The delivery difficulty will be largely met by its mechanisation, and that by the aid of the telephone circuits. This will be done by means of typewriter keyboard telegraph circuits superimposed upon the addressees' telephone lines as a special fitment. The fitment will be of a pattern approved by the Government engineers, purchasable from private manufacturers or procurable by hire from the Administration itself.

In the next 10 or 15 years every business house, bank, factory, office, large or small, will have the option of obtaining this supplementary apparatus, or, alternatively, an automatic teledictaphone. Facilities will also be increased for direct private inter-office communications.

With the increase in the number of telephone users the problem of "lightning delivery" will thus become less acute. Hand-delivery will only be resorted to in the case of the diminishing number of addressees "not on 'phone," and where practicable, as in rural districts, delivery will be effected by means of motor-cycles, &c.

Thus, by one system or the other, telegrams would be available for the addressee whether he were in actual attendance at the moment or not, and at any time of the day or night, as such automatic apparatus envisaged would

produce a printed copy on the addressees' receiver whether he were in attendance or not.

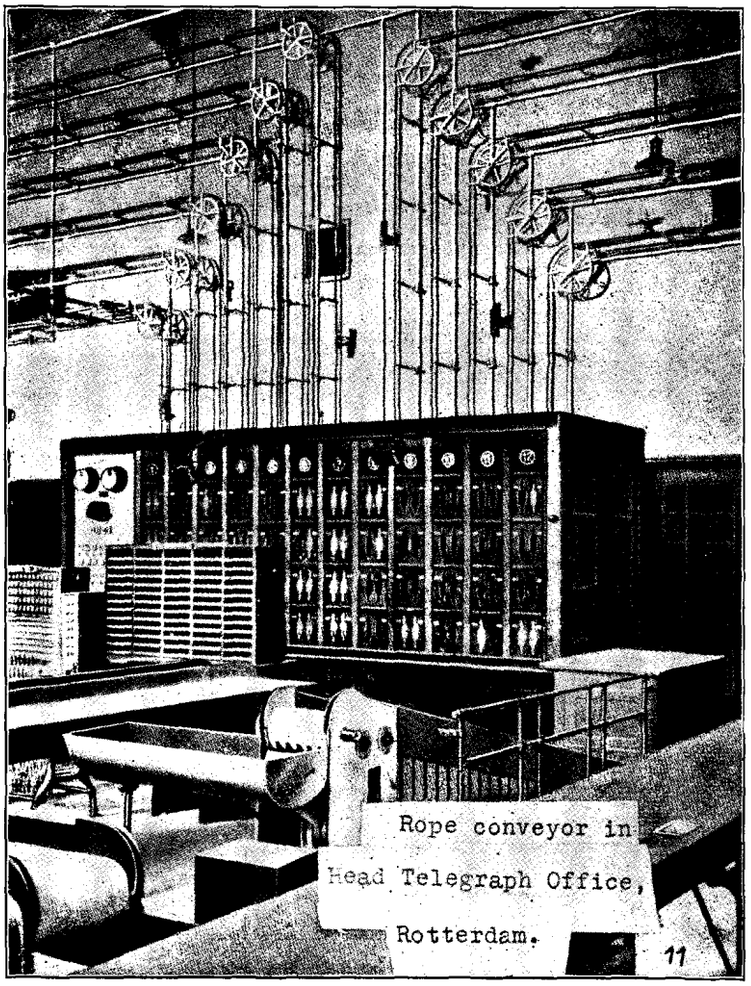
The cost of such apparatus will not be heavy, as mass-production methods will be adopted in their manufacture.

The provision of these facilities will be available for private residences and for the termini of Branch Exchanges.

All post offices now using the telephone for the transmission of telegrams will then also be provided with similar superimposed telegraph apparatus, the better to preserve the secrecy of a telegram, which is now not infrequently dictated over the telephone in the hearing of the public.

The posting of a *copy* of any telegram thus dealt with, or simply telephoned to a subscriber, will no longer be considered necessary in an efficient service. This somewhat superfluous process should not outlive the next decade.

The telegraph offices of 1950 will differ considerably from those of the present day, both in appearance and organisation, especially the larger offices.



As regards the latter, with fully mechanised services, the personnel of the Engineer-in-Chief's department will loom more largely in its every-day work and duties concerning the telegraphs.

As I have already said, we may expect to see type-printing telegraph apparatus equipped with typewriter keyboards on all circuits, main or local, the main or trunk circuits being multi-channelled. Each group of the latter type will be under the charge of a qualified engineer of the Engineer-in-Chief's Department. He will, of course, have no control over the traffic.

Larger groups of the simpler circuits will be under the technical charge of an officer of similar or identical rank, according to the size of the office, traffic dealt with, &c.

These officers of the Engineer-in-Chief's Department will have placed under their immediate charge the necessary staff of fully qualified mechanics, who will bear the more definite title of "mechanic," instead of the wider appellation of to-day. A liberal supply of spare apparatus in certified running order will also be readily available, and in the larger offices in the case of multiplex sets, one or two will be constantly maintained in actual running, so that complete change-overs may be made in the event of an awkward fault or complete breakdown.

The duties of these officers of the Engineer-in-Chief will include the selection of the most suitable conductors.

The necessary supervision of the traffic itself will most naturally be provided by the commercial side and its supervising staff. The dirigeur, as

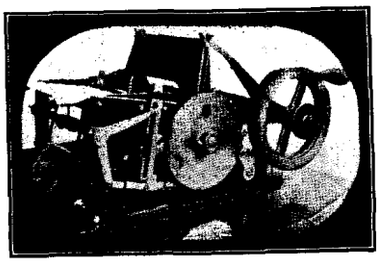


FIG. 10.—TELEGRAM FOLDING MACHINE AS USED IN NEW ZEALAND.

at present understood, will cease to exist, but recruitment for the engineering posts will be open to a stated percentage of technically qualified telegraphists, after a thorough examination, the standard of which would be fixed by the Engineer-in-Chief, plus a certified first-class manipulative knowledge.

The presence in a telegraph office of an active and fully responsible representative of the Engineer-in-Chief will be found to secure not only the efficiency of the telegraph apparatus, but the efficiency of the circuits over which they are to work. This will naturally give to the latter department fuller opportunities for observing the day-to-day difficulties, and for scheduling and subsequently analysing them. It will, in effect, give the engineering department a fairer chance of meeting the criticisms and complaints which, it is feared, at present arrive too late for successful examination and through a third party.

Now, apart from these considerations so far as they fit the present circumstances of the Inland Service, the scientific developments for "making the most of the Line," as Dr. Frank Jewett terms the new systems, the equipment of telegraph offices by the use of voice-frequency, carrier-current, polar-duplex methods, &c., all involving the use of the same circuit for simultaneous working of telegraph and telephone, and the use of type-printing forms of telegraph apparatus, MUST bring into prominence the necessity for actual engineering responsibility for the good working of both apparatus and circuits, whether the latter be physical or phantom.

In one word, specialisation of function in the telegraphs *will* have fully arrived. The advantages of such specialisation for the telegraphs, a specialisation already long enjoyed by the telephones, will be found especially helpful in cases, for example, where alleged detrimental effects are felt upon *telephone* circuits by certain voltages used on *telegraph* circuits working along the same route, or vice versa, where it is suggested that a *telegraph* circuit is working indifferently due to certain technical restrictions imposed upon it on account of indifferent or disturbed *telephone* audition.

With the new arrangement, such matters become purely domestic to the engineering side, to be settled satisfactorily by that department within its own domain.

The simple situation will then be as follows: the engineers provide, maintain and guarantee both line and apparatus in first-class working order.

The equally clearly defined duty of the manipulative side will be to dispose of the traffic expeditiously.

The possibilities of the newer telegraph systems of obtaining the maximum number of traffic channels from one, two or more physical lines is possibly not yet realised in this country by everyone in the service. One understands the difficulties of harried supervising officers during the transition period of changing from one system to another, but when one reads in a contemporary:—"Concurrently with the changes in *apparatus*, the Engineering Department is busily engaged in adding still further to the task of maintaining efficient communications by substituting high resistance screened telephone conductors with a drastic power limitation, the displaced telegraph lines being surrendered to the telephones," one can only say that the statement is misleading, as these systems are well tried and proven, and their ultimate aim is economy of lines, and the reduction of expense due to new construction. Further, the systems have also yet another possibility, that of the extended use of the telegraphs between large offices, works, depots, &c.—another financial advantage to the Inland Telegraphs.

The possibilities of the future which I have foreshadowed, with engineers in charge, will relieve the traffic side of much of the worry and responsibility on the technical side of which complaint is made. The traffic side will only be answerable for that portion of any adverse criticism which may be due to the failure to produce an A1 output from an A1 circuit.

It must be borne in mind that these modern superimposing systems are far and away superior to the methods available, let us say, in the early days of the Anglo-Continental telephone circuits, when, by means of the Van Rysselberg system, telegraph circuits were superimposed upon the London-

Paris and London-Brussels telephones, with no small success, on the whole, although I am afraid the telephone had the worst of the bargain, at times.

Those were the days prior to the advent of valves and filters.

Possibilities of Carrier Current Systems.

The carrier offers :—

(1) Three extra telephone channels on one pair of lines.
(2) Ten extra duplex telegraph channels on one pair of lines.
(3) Ten to twelve two-way telegraph channels on a 4-wire telephone cable circuit, or
(4) Five to six two-way telegraph channels on a 2-wire telephone cable circuit.

THE ADVANTAGES.

(*a*) Increased circuit facilities that are in every way equal to or an improvement upon those existing by means of long distance lines.
(*b*) Secrecy in transmission.
(*c*) Reduced maintenance costs per circuit mile.
(*d*) Absolute reliability.
(*e*) Carrier can connect towns a great distance apart by bridging together, for carrier purposes, any intermediate lines without interfering with existing facilities.

The possibilities noted above refer particularly to overhead lines, but superposition is quite practicable for cables, telephone, telegraph or lighting.

While on this interesting subject one may, perhaps, express the hope that future Chancellors of the Exchequer will be more liberally disposed towards research work in connexion with Post Office activities. When one has seen the facilities elsewhere for this, the most essential work of a department whose motto should always be "excelsior," one cannot but greatly admire the good work done in this country on a parsimonious expenditure, while deeply grieving at what one dares to hope will, at no very distant date be ameliorated, even if the reproach be not wholly removed.

There are other developments of telegraphy which will create their own particular market, picture telegraphy, for example. This alone, however, is not going to revivify the Inland Telegraphs of this country, though, naturally, it will not harm it.

Educationalists and business men are inclined to the conviction that the typewriter has spoilt the art of handwriting. Certainly, my personal experience of the public who do *not* use typewriters is along the line that such would rather leave the deciphering of their own caligraphy to the experienced telegraphist at the sending end than use a facsimile system which would all too faithfully reproduce the writer's eccentricities, and annoy a correspondent at the other !

Facsimile telegraphy is, however, still advancing, and certain experiments quite recently carried out are said to have decreased the transmission of an entire picture to one minute.

There is television, too, which is fitting itself into broadcasting, and could, of course, be associated with telegraphy and/or telephony.

Opinion, however, seems divided as to whether the sight of one's correspondent at the other end of the circuit would *always* tend to a better understanding !

The huge developments of the next few years under the aegis of the Electricity Board will facilitate the use of quite a number of labour-saving and comfort-giving devices in connexion with Post Office activities in general and telegraphy in particular. With cheap light and power at the door of every post office and telephone exchange, improved cleansing, lighting and heating will no longer be difficult or expensive.

The heavy swing doors of public offices will then open more easily at the pressure of a small electric button than at the present moment they are inclined to give way to the weight of a burly butcher ; dust will no longer be *swept* up in clouds, it will be led away by electrically-driven suction devices, while artificial sunlight will be provided for the benefit of the staff in those offices still remaining where natural sunlight is a rare and timid visitor.

There is just one other possibility, which the completion of the Electricity Board's scheme will in a few years render practicable. In the event of several of the present broadcasting wavelengths being required for telegraph and/or telephone purposes, on the demand of public safety, the police, or of other national purposes, with electricity served to every householder the wireless programmes could be superimposed upon the light and power mains, and thus delivered from the broadcasting station instead of by the ether.

One hears of objections to cord carriers, but the tide cannot be stemmed. Mechanisation of the service will continue. To this the staff will adapt itself in time as easily as to an escalator. Other administrations are proving the utility of these labour savers, and British offices cannot afford to lag behind. Whether *we* have the best type of apparatus for this purpose it is not my job to decide, but the slide now exhibiting shows an example of a fairly simple and effective type of some I have seen in other countries.

There is also this little machine for folding telegrams, as used in New Zealand. While dealing with this same Colony, the next two slides give some idea of the proportion of counter space given to telegraph traffic compared with the whole of the remaining Post Office activities in Wellington.

It is a measure of the importance of the telegraphs in the eyes of the New Zealand Postal authorities. Home administrations please copy, and make the telegraph user welcome !

Although I have recited the many forces against the Inland Telegraphs, I yet see no cause for despair, despite the jeremiads within and without the service. Provided the service is organised on new lines fitted to the new conditions and upon a basis which will permit mass production of A1 apparatus, there should be a good return for the nation's money. In taking this step, it will need courage of a high order to scrap and to scrap mercilessly, but it will be the only way.

I know with what tender solicitude an engineer looks upon old stocks of relays, printers, typewriters, &c., and one cannot but admire these genuine motives of economy.

There is such a thing, however, as the *economies* of economy, and one always recalls the miser of Molière in these cases !

One event I fully expect to see in the next few years, and that is, side by side with the Postmaster-General will be his assistant the Postmistress-General. Why not ?

There are other things one may only be permitted to *hope* for. In the not too distant future I *should* like to see that the present theory regarding the presumed incapacity of Civil Servants to successfully run a public service had received its quietus, and the reasonableness of the claim admitted that the Post Office itself, by that time administered under a Ministry of Communications, should be permitted to run its services as a whole, balancing its losses by its gains.

This permission to be confined to those services where the public or public policy demanded a first class quality service at second or third grade prices.

Not every 'bus or tram stage is remunerative, nor do all railway freights fully cover expenses.

Even on the Postal side there was a loss last year of 1½*d.* per unit cost of 10*d.* on the 140,000,000 parcels carried, though one heard no protest.

Conclusion.

It may be considered by some that I am belittling the telegraphist craft of to-morrow by emphasising the typewriter keyboard. Far from it, but no one can get away from mechanisation these days, and nothing is gained by kicking against the pricks.

These changes need be feared by no man or woman who knows his or her job. Also, there is more in a telegraphist's job than a knowledge of the typewriter keyboard. The *expert* telegraphist will always be worthy of high pay whether he or she manipulates a keyboard or a Morse key, just as the compositor of to-day, with his linotype keyboard, earns as much, if not then more, than when he lifted every individual letter from his "case" and placed it wrong way round by hand in his composing stick. The Morse code, also, is not yet dead !

Telegraphy a dying industry ? Not yet, anyway, and probably not until that day arrives when Man will find the medium through which he can transmit not the written word, but his thoughts, across the seas !

For the present, let us remember that the gas industry delivers millions more cubic feet of gas to-day than it did 20 years ago. Wireless has not ousted cables ; indeed, cable-designers are now challenging the cross-Atlantic telephone, and they look like winning with a service immune from fading. Broadcasting was to see the supersession of the gramophone. There are more records sold now than ever. The gramophone was going to spoil the piano trade. I am told that last year was a bumper year for the latter.

It is because of these things that my faith in the Inland Telegraphs is confirmed and encouraged. This unwavering attitude on my part is further strengthened by my faith in a staff whose loyalty has been severely strained of late by events which are beyond *their* control or of that of the administration, and yet a staff which will, nevertheless, willingly co-operate with that administration once they are convinced that hope is not dead.

I claim to know something of the doggedness and the team spirit of the telegraphist, and it depends much, very much, upon this spirit of goodwill and doggedness, equally with the genius and enterprise of inventors and the skill of engineers, what the Telegraph Service of this country will be to-morrow.

Success is assured, despite the apparently bewildering new conditions with which the future opens, if wholehearted co-operation is assured between staff and administration.

The reorganisation necessary is not a job of a few months, but of one, two, perhaps three, or even more, years, and the period may be a trying one to everyone.

It is a long time, I know, but everyone also knows that there is no royal road to success here, and that only mutual help and hard work can bring the desired result.

The Telegraphs is not the only industry suffering from economic changes and transition periods.

Professor Gilbert Murray, in his latest book called "The Ordeal of This Generation," dealing with the chaotic condition of affairs, both political and economic, at the present time, gives a very sympathetic estimate of the phase through which our country is still passing. He says "We stand to-day

between two worlds, one dead, the other waiting to be born," and he pays a splendid tribute to the thousands upon thousands of men and women of to-day in these islands of ours who are sticking to their jobs, plugging along bravely without recognising that they are brave, though the future is blurred and shows nothing much of certainty except, perhaps, the uncertainty.

To such as these the next generation will owe much. It remains to the men and women of the Telegraphs to hand down to that next generation a service worthy of to-day's struggles and disappointments, and it can be done.

REMARKS BY SIR HENRY BUNBURY, K.C.B., AT THE CONCLUSION OF MR. TYRRELL'S PAPER.

I SHOULD like first to express my thanks to Mr. Tyrrell for a very stimulating contribution to this important subject. He has, I feel, taken the right approach to his problem ; and after all the right method of approach to a problem is the first requisite for its successful solution. Apart from technical matters, on which I cannot profess to have an opinion, there are few of his propositions with which I should disagree, though one might perhaps give rather more or less weight, as the case may be, to particular factors than Mr. Tyrrell does. For instance, I am inclined to think that he over-estimates the increased competition to be expected from the postal side in the future. It is perfectly true that the scope for an inland telegraph service in small and compact countries like Great Britain, or for the matter of that, Belgium or Holland or Denmark, is very much narrower than in spacious countries like Germany and France, and still more, the United States. But I rather doubt whether, in spite of the great improvement in methods of transport which we anticipate, postal facilities will cut further into the field which is at present open to a telegraph service. The true utility of the telegraph service of the future is, I think, on lines which no postal service can supply. I will come back to this point later.

As regards what Mr. Tyrrell says about the telephones, he is right, I am sure, in pointing out that in general the cost of telephone service is likely to increase rather than to decrease. We can, I think, say this with some confidence as regards those countries where telephone service is at present relatively cheap. I am not so sure, however, that it will ever become necessary to raise telephone charges in this country, where they are at present relatively high. In America, where the tendency in recent years has been to increase charges, they seem to think that they have reached the peak. In their last report the American Telegraph and Telephone Company say : "With the exception of a few places where rates are clearly inadequate, and in spite of the tendency for the cost of furnishing local service to increase as the extent of the service increases, the continuing technical advances in the telephone art and improvements in operation methods, should enable the system to provide ever-increasing service in local areas without further increase in rates." I think, without being too positive about it, that we may hope to achieve similar conditions in this country. Since 1921 British telephone charges have already been very substantially reduced and we have now practically no annual surplus. But if we can do what the Americans expect to do—and there is no reason why we should not—we may hope to avoid raising rates, and, in the alternative, a telephone deficit.

There is one other point on which I should like not so much to differ from as to qualify, Mr. Tyrrell's point of view. In dealing with the relations between the engineering and the traffic and operating services, he puts in a plea for specialisation of function on the lines "that the engineers provide and maintain both line and apparatus in first-class working order while the equally clearly definite duty of the manipulative side is to dispose of the traffic expeditiously." This is right, but is not, I would suggest, complete without another proposition of perhaps even more importance. It is a principle which has become more and more clearly recognised in progressive concerns that it is for the productive or operating side to say what they want equipment to *do*, and for the technical side to produce the equipment which will do it, and will do it continuously and efficiently. I expect that this is the point which Mr. Tyrrell had in his mind and if so I am merely dotting the i's for him. The principle, however, is of such fundamental importance that it is well, I think, to state it quite explicitly.

What I like most about Mr. Tyrrell's paper is that he shows no signs whatever of despairing of the telegraphs, and that he believes in the men who work them. Admittedly telegraph services in all countries, except great continents like the United States are and have for some years been passing through a crisis. Nor is this peculiar to telegraphs. The railways of the United States, in spite of the great prosperity of their country, are under road competition losing traffic more heavily than the British railways, although we do not hear so much about it. I fancy that they are treating their crisis in the way in which a crisis should be treated, viz., looking the facts fully in the face and bracing themselves to meet it. And I am convinced that if we look at the facts about inland telegraphy fully in the face we shall see no reason for throwing up our hands.

Let us suppose that the telephone had been invented before the telegraph, and that only recently some inventive spirit like Colonel Booth had come along with telegraphy as a new idea which had been worked out and brought up to the stage of commercial utilisability. What should we say about it ? Should we say that it is of no practical use in this country because the posts, and a 100% telephone development, provide every kind of service that telegraphy could possibly offer ?

I don't for a moment think so. The telegraphs, as Mr. Tyrrell rightly says, are "not a dying industry, but a growing one, viewed on the grand scale and the wide horizon." We should, after studying the possibilities of the new invention probably discover at least this, that telegraph line-time is cheaper than telephone line-time, and therefore wherever the spoken conversation is not wanted the telegraph has the advantage over the telephone in conveying the message so long as that advantage is not neutralised by the greater cost of telegraph re-transmission as compared with telephone switching.

There will always, I think, be a very large field for a written message service as distinct from a conversation service, especially for communications with overseas, for which, as Mr. Tyrrell points out, the inland telegraph service is to a large extent the collecting and delivering agency. The problem here is, to what extent will it be economically advantageous for us to convey those written messages *telegraphically* and not telephonically, up to the office of destination or from the office of acceptance. Telegraphy has, in the relative cheapness of telegraph line, a fundamental advantage wherever the distance is considerable, though Mr. Tyrrell's 20 miles strikes me as too low : what neutralises that advantage is the costly process of re-transmission. As a basis I think we may expect to see telegraphic transmission of written messages wherever enough traffic exists, or can be got, to justify a machine-operated direct service. On that foundation it may be that other services of the by-product variety can usefully be built. Then, in the second place, the greater cheapness of telegraph line-time will make it possible to offer telegraphic communication to the public at lower rates than telephone communication where the distance is considerable, and this again should secure to the telegraphs a considerable volume of business which *could* be conducted by telephonic conversation so far as the public is concerned, but comes to the telegraph on the ground of cheapness alone.

Thus telegrams will be necessary for all communications where (1) a written message is demanded, or (2) a telegraphic message can be offered to the public at a lower charge than a telephonic service and is for that reason preferred. And such telegrams will be handled telegraphically wherever the greater cheapness of telegraph line-time is not outweighed by cost of retransmission.

I see, therefore, no reason why we should not expect a steady and even a growing volume of telegraph traffic, operated telegraphically for the whole or part of its course, provided that we exploit to the full, and in every way, the fundamental advantages of the telegraph as now developed ; but I think it will be rather a different sort of traffic from that which we used to handle. It may be that these things can only be done by re-casting our equipment and organisation and re-educating our public. Mr. Tyrrell has given us some ideas as to things which are necessary to achieve this end, and no doubt this discussion will produce others. We are very much indebted to him.

CRICKET : NOTTINGHAM *v.* SHEFFIELD.

A PARTY of 22 members of the staff of the Sheffield District Office and Engineers visited Nottingham on Tuesday, June 18, at the invitation of the District Manager's Staff. The primary object of the visit was a cricket match, and this took place under ideal conditions, the weather and the surroundings of the cricket ground being perfect.

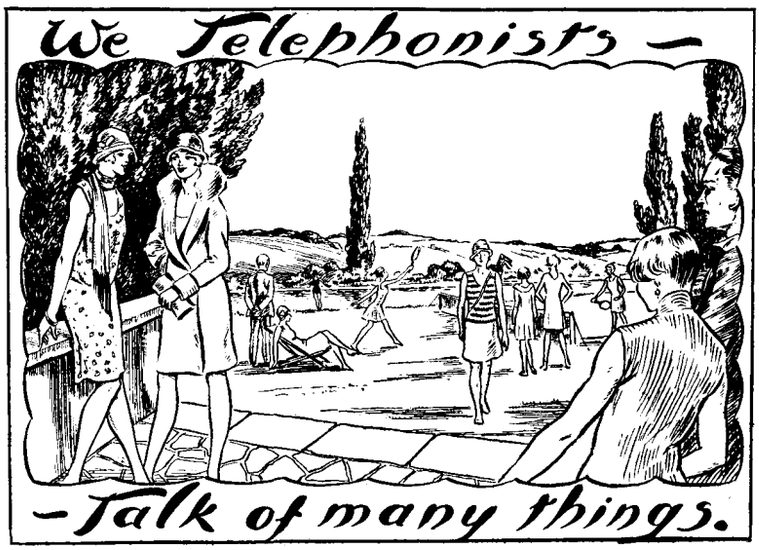
Thanks mainly to the prowess of the Engineering members the Sheffield team won by 82 runs. All the other honours of the day undoubtedly went to our Nottingham colleagues, who not only provided excellent refreshments during the interval between the innings of the two teams, but also spared no pains to ensure that the whole of the visitors enjoyed every minute of the visit.

We are now looking forward to the return visit, which we hope will take place early in August.

THE RETIREMENT OF MR. H. P. STEED.

THE position of an Executive Engineer, especially one placed in a large telegraph office, is undoubtedly a highly responsible one. When that office happens to be the capital of the Kingdom, and when the period of the appointment covers nearly the whole of the war and post-war period, the position of the holder of such an appointment cannot be but unique for the demand upon that officer's time, knowledge and tact alone. That Mr. Steed retired from the C.T.O., London, with the best wishes of all those with whom he came into contact from 1915 to 1929, therefore, is the best tribute one could possibly pay him, viewing the duties and difficulties from the commercial as against the technical side. Only those who, from time to time during the years of stress and strain, have been forced to call upon the Executive Engineer to assist, at times it would seem with the impossible, are entitled to correctly appraise the tact, courtesy and whole-hearted co-operation of Mr. Steed. Mr. Steed's earlier years spent in the C.T.O. as a telegraphist, however, served him well, and if the new world of high-speed printing telegraphy seemed to him at moments an over-elaboration of the craft of telegraphy, the beauty of a machine was never lost upon him. Maybe that, now he has more time to devote to his much-beloved hobby of music, and his speciality of the church organ, some of the gadgets he has met with in modern telegraphy may give him new ideas for easing the "foot-work" of his favourite instrument ! In any case, a happy retirement, dear colleague and friend !

J. J. T.



Looking Downwards.

FROM the eminence of that wisdom which comes with advancing years how often we look backwards and reflect, with some measure of amusement, upon the misconceptions of our youth. Now don't turn away, I am not about to commence a sermon, and even if I were there would at least be no need for immediate action until the collection were threatened. The thought came to me and prompted the reference when I felt a line or two of "The Village Blacksmith" running through my head recently.

As a party piece the poem had its merits, but I must confess that I misunderstood it in parts. I used to picture the smith standing beneath the tree with arms akimbo, glaring at a gaping group of rustics. I suppose I formed the notion from the words "Under a spreading chestnut tree the village smithy stands," and "He looks the whole world in the face for he owes not any man." I realise now, of course, that the poet, when he referred to the "smithy," was not being familiar at the expense of the smith but that he meant the house wherein the smith laboured. I know now that to look "the whole world in the face" was metaphorical and indicated a sturdy independence of mind born of a true appreciation of his honesty.

In some mysterious manner it seems that the practice of looking the world in the face is falling into disuse. Whether it be the influence of the Higher Criticism or the Hire Purchase I do not know. Personally I find in myself a tendency to look downwards—and sometimes upwards—instead of looking straight at the world like the blacksmith. And with that desire which prompts each of us to defend an idiosyncracy and to clothe it with an appearance of the rational, I would say that to look downwards has much to commend it. After all, might not the world grow tired of being continually fixed by the eye of even the most estimable of blacksmiths and might it not come to resent the inescapable vision of the normal face? Of course, if you are beautiful it is the world who will look *you* in the face and then you will, quite properly, look downwards—from motives of maidenly modesty and of the need to watch your step.

It was when I was looking downwards recently that I found the harebell —where once there had been fresh grass and shady trees but where now there were only broken bricks, chipped tiles, scraps of wood and heaps of sand. There she stood like a dainty fairy who had forgotten to vanish at the first tint of dawn. Or she may have returned for a moment to look upon a scene once rich in happy memories but which was now fast becoming desolate and I may have surprised her in reverie. She had such a delicate beauty, she looked so fragile amid her coarse surroundings and so pathetic in her loneliness that I took her home. She graced my desk for days and the buds with her opened and seemed to gaze up at her as a queen to be worshipped. They looked upwards in adoration: I had looked downwards in pity.

The harebells have gone and other wild flowers are disappearing, but hope springs eternal in the human breast and any day now I may find sixpence. Who knows!

PERCY FLAGE.

According to a contemporary, Gerrard is to Geneva as "a rushlight to the sun," or, in his own words, "if our telephonists' work of connecting and disconnecting is rather like fast tennis, so many and varied are the duties of a Genevan operator that theirs is fast badminton, golf, tennis, stoolball, lacrosse, hockey, billiards, quoits, polo, bowls, croquet, football and cricket! They have to describe the weather at any given place, say what won the Swiss equivalent to the Derby, know when the last Sunday excursion train leaves some distant froghole up in the Alps for another obscure huddle of chalets out in the wilds (the question often being asked in German or Italian!) give the address of the nearest chemist, repeat the names and addresses of every single person who rang up Monsieur T. while he was away in Zurich—or Yokohama; tell Mademoiselle C.'s friends when they ring that Mademoiselle has gone to chez Henri for the evening, and transfer them to that number"; and so on and so on. The article concludes "There are still more duties which the operator has to undertake, but enough have been instanced, I think, to render highly improbable any considerable rush of emigration from Gerrard to Geneva."—And to this mild surmise we subscribe heartily.

To a Colleague.

Seated one day in the school-room
I was weary and ill at ease;
And it took me all my time, lass,
To mind my Q's and P's—
Till at length I asked for a casual
When the hour was nearing ten;
And soon with my fellow jail-birds,
I was cheerfully saying "When?"

Some café-au-lait and a biscuit
Soon worked like a potent charm;
And refreshed my wearied spirit,
Restoring my wonted calm.
When I drifted back to the Lecture,
I was feeling twice the man;
Whereas before the treatment
I was merely an "also ran!"

Now, it may be that one fine morning
You'll report at the Auto-School!;
So take this tip from your mess-mate
And keep this unwritten rule:
If you find your wits a-wandering
And you cannot concentrate—
Just toddle out and "have one"
And your brains will soon scintillate!

C. A. S.

Contributions to this column should be addressed: THE EDITRESS, "Talk of many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

NEWCASTLE NOTES.

Operator! operator!!
Where are you now?
While I ring and I ring
And I shout Hell-ow!
Are you drinking your tea
Or powdering your nose
Or mending that hole in
Your smart silken hose?
What! You've been
busy!
Oh come, that's not true.
No sub. would
ever
Believe that of you.

J. H. W.

Sometimes, however, we do get the ha'pence, and letters such as the following are very gratifying:—

"Dear Sir,

METRO-VICK HOUSE.

We would like to take this opportunity of expressing our thanks and gratitude for the very expeditious and thorough way in which you have dealt with the telephone arrangements in our new building.

We were able, through the thought of your staff, to continue our business during a somewhat difficult changeover without the slightest telephonic interruption.

Knowing full well that you get more kicks than pence, it is an added pleasure to us to express our sincere thanks for the great assistance you have been to us in the matter of the telephones.

Yours faithfully,

METROPOLITAN VICKERS ELECTRICAL CO., LTD.,
(Signed) H. PATERSON, *District Manager*."

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of June resulted in a net gain of 2,822 stations as compared with 2,542 last year. The net gain for the June quarter amounted to 11,664 stations as compared with 11,146 in the corresponding quarter last year.

The smallness of the increase over last year's figures is disappointing. As an antidote to this disappointment we have been looking up the figures for new business since 1912 and we find that new business (excluding transfers) for the quarter just finished amounted to 21,240 stations, as compared with 7,222 in the corresponding quarter in 1912. Certainly we have grown in the meantime, but we do not intend to rest on our oars.

A new library recently built in the Burroughs at Hendon has a tower or turret on the top which is very much like a telephone kiosk. One day someone with an eye to a practical joke put one of our signs, "You may telephone from here," on it, just at the time when one or two people going past the building were looking for a call office. One enquired inside for the call office and would not be convinced there wasn't a call office, but when he got outside again and looked up the sign was gone! I wonder how many people were taken in? Two at least wrote letters to the local press about it.

Our best wishes to Mr. J. H. James, Contract Officer, Class II, on his transfer to Brighton.

* * * *

Contract Branch Cricket.

In the fourth match of the series of league games, played at Chiswick on June 25, the Traffic Department succeeded in winning. Scores: Contract Branch 103, Traffic Branch 119 for 6 wickets.

This result finally disposes of the Contract Branch's chance of retaining the Cricket Shield, the destination of which was settled in the match between the Accounts Branch and the Traffic Branch played on July 9, which resulted in a win for the Traffic Branch, who are the new champions for the season.

* * * *

L.T.S.—Bowls.

The team's run of success in the league tournament was arrested by the L.P.S. in the game played at Chiswick on June 20, 1929. In the sixth game of the tournament, five of which have been won, the L.P.S. triumphed by 66 shots to 60.

It was, like many other games this season, a most exciting contest and once again the result of the match depended on the last end of the game.

Fortune and good bowling favoured the L.P.S., and they eventually proved worthy winners of a most interesting and enjoyable match.

* * * *

L.T.S.—Cricket.

A very interesting position was revealed when the Accounts Branch met the Traffic Branch on Tuesday, July 9, in what was generally regarded as the "needle" match of the tournament, when the destination of the League Shield would be decided. Up to that time the former were an unbeaten side, having dropped only one point. On the other hand, the Traffic team had experienced defeat at the hands of their opponents at the first meeting and were therefore a point behind. The Traffic Branch required to win to enable them to hold the trophy, whilst a draw would suffice to enable the Accounts Branch to regain the honour. Such was the atmosphere when the game began. "Captain" Drabwell, of the Accounts, won the toss and decided to put in his opponents. Following a pre-concerted plan of campaign, the first four Traffic batsmen "laid on the wood" with great gusto to the extent of 106 runs. The remaining seven "had to go," and the side were out for a total of 118 runs. The Accounts then set out to knock off this total. An astonishing collapse set in after the departure of Taylor, seven wickets falling in quick succession for only 25 runs. With the advent of Drabwell and Lewis, however, a change took place, and for 35 minutes this dour pair made a stand—but without adding materially to the score. The steady and accurate bowling of Crossley and Merrick eventually told, and the intrepid batsmen followed their predecessors to the pavilion. When the last man came in the keenness of the fielders intensified. As the rival captains had agreed to draw stumps at 8 o'clock many anxious glances went towards the clock, which now indicated a period of only a few minutes in which to dispose of one of the last two batsmen. They both survived until a minute to eight, when, after a consultation between the umpires, it was announced that the last over should be delivered. Excitement ran high and the Traffic men were on their toes. The first four balls were sent down without incident. The fifth, however, was a snorter from Crossley, and it caught Moyle napping and spreadeagled his stumps. The Traffic team had won. Whilst enthusiasm ran high among the victors commiseration was expressed with the losers, who had so narrowly missed obtaining the necessary point to enable them to regain the shield. Thus the match ended, and a more exciting finish could not be wished for. The contrast between the two sides when fielding was marked, and it can be said truly that the winners gave nothing away—until after the match.

Scores:—

Traffic Branch.		*Accounts Branch.*	
Thomson, b. Taylor	32	Taylor, l.b.w., b. Merrick ...	12
Leaver, b. Taylor	2	Oliver, c. Webb, b. Merrick ...	2
Grove, c. Oliver, b. Moon ...	24	Vacher, l.b.w., b. Crossley ...	4
Meyer, l.b.w., b. Moyle ...	26	Moon, c. Leaver, b. Merrick ...	0
Webb, b. Moyle	4	Young, c. Adams, b. Merrick	1
Crossley, c. Oliver, b. Moon ...	2	Smith, c. Walby, b. Merrick ...	6
Adams, c. Boston, b. Moon ...	0	Pick, b. Merrick	0
Bishop, c. Oliver, b. Moon ...	4	Drabwell, b. Merrick	11
Walby, l.b.w., b. Moyle ...	0	Lewis, b. Crossley	0
Merrick, not out	1	Moyle, b. Crossley	1
Hancock, b. Moon	0	Boston, not out	2
Extras ...	23	Extras ...	8
	118		47

The annual encounter with the A.G.D. was played at Chiswick on July 2.

The A.G.D., as on every previous occasion, succeeded in winning fairly comfortably, the scores being: A.G.D. 109 for 7, L.T.S. 73.

Although the record of the L.T.S. in inter-departmental games is a poor one, there is sufficient talent now available to offer much stronger opposition to other service departments, and consideration might profitably be given to the arrangement of matches between picked L.T.S. teams with the object of building up a strong L.T.S. eleven.

* * * *

L.T.S. Sports Association: Tennis.

Progress is being made in the "Agnes Cox" and "Pink" Competitions. The following teams have so far been successful: in the former, Controller's Office teams A/cs A.R.5, A.R.4 and A.R.1, Staff Section R.1 and Chiswick, Central and Avenue Exchanges, and players representing Maryland, Grangewood, Enfield, Victoria, A/cs A.R.1 and Staff Section R.1 in the latter.

The Committee have arranged a meeting to fix the dates of the finals, which will be duly announced in the next issue of this Journal.

* * * *

Hockey.

As the result of the discussion at the General Meeting, a meeting was held on July 17 to form a Hockey Section and arrange an inter-club competition during the coming season. Owing to the unavoidable absence of Mr. Hugh Williams, the Chair was taken by the General Secretary, Mr. George Lewis. Representatives from Sloane, Battersea, City, Hop and Trunks attended. Miss Grist, of the Trunk Exchange, was elected Hon. Secretary, and a Committee was formed consisting of one representative from each club or proposed club.

It was decided that all exchanges unable to form a separate club organise a composite club. It was also decided that the Committee should arrange a competition, but the question of a trophy would have to remain in abeyance, as the Women's Hockey Association prohibited such contests. A discussion then took place with regard to grounds for clubs not already provided for, and it was decided to request the newly-formed Committee to attend to the matter.

The good attendance and keen interest shown at the meeting indicated that the Hockey Section of the L.T.S. Sports Association is bound to be a success.

LONDON ENGINEERING DISTRICT NOTES.

Cable Breakdowns in London Subways.

REFERENCE has been made in previous notes to the serious dislocation in telephone traffic due to the fires in the Victoria Embankment subways.

Enquiries were held on each of the two large outbreaks in the Victoria Embankment subway by the City Coroner, and evidence was taken from officials representing the Post Office, the London County Council and other undertakers who owned plant in the subways.

The subway is owned and maintained by the London County Council, and subject to certain conditions as to payment, &c., permission is given for undertakers to place plant in the subway. At that part of the subway where the fire occurred there are gas, hydraulic and electric power mains,

telegraph and telephone cables. The London County Council also had a system of electric cables with a number of service leads supplying current to the lights in the parapet of the embankment.

The finding of the jury was that the fires were due to defects in the L.C.C. electric lighting cables, and they recommended that these cables should be replaced as early as possible by a more modern system. This replacement was being carried out when the second big fire occurred. This was found by the jury to have been caused by sparking at the junction of the old electric light cables with some temporary leads which were in use pending the completion of the new system.

It is stated that when the new system is completed the Victoria Embankment will be one of the finest lighted thoroughfares in the world. This is satisfactory, but it is unfortunate that so much injury was caused to the telephone cables, which are as incapable of causing fire as any electrical plant can be. There is, however, another and brighter side to the picture. Some of those who saw the great molten mass of metal and twisted wire that had once been cables thought that the restoration would necessarily take months and that there would be great delay in restoring service. So effective, however, was the co-operation, and so strenuously did the Post Office staff in the subway strive to evolve order out of chaos that within two or three days a fair service was being given, and within a fortnight telephone traffic was being carried as usual.

Promotion.

L. F. Worthy, from Chief Inspector to Assistant Engineer.

Transfers.

A. W. Whittaker, Inspector, N.W. District, to London Engineering District.

J. E. Gilbert, Inspector, Scotland East District, to London Engineering District.

Retirement.

A. E. Bebington, Inspector.

Presentation to Mr. J. H. Watkins.

On Tuesday, June 25, Mr. Watkins, on proceeding to a few days' annual leave, bade farewell to the L.E.D. prior to taking up his appointment as Sectional Engineer at Bangor. On the previous evening he was presented by Captain Hines (on behalf of his personal friends and colleagues) with a case of two pipes, a leather tobacco pouch, and other smoker's requisites. Messrs. Dolton, Hay and Hill also expressed their regret at Mr. Watkins' departure, whilst congratulating him on his promotion. Mr. Watkins briefly and suitably replied.

Opening of Automatic Exchanges.

The following automatic exchanges were opened during the month of July:—

Name.	*No. of Equipment Lines.*	*Date opened.*	*Manufacturers.*
Beckenham ...	3,000	July 3, 1929	Siemens.
Reliance	2,700	July 11, 1929	General Electric Co.
Maida Vale ...	7,500	July 20, 1929	Siemens.
Edgware	1,300	July 20, 1929	General Electric Co.
Fulham	7,500	July 27, 1929	Standards.
Manual Exchanges.			
Emberbrook ...	C.B. No. 1	July 31, 1929	Standards.

Exchange Transfers.

Chancery.—On July 27, at 2 p.m., Chancery Manual Exchange was transferred to Terminus Exchange, where it will function hypothetically.

General.—The restoration of the service, following the "fire" referred to above, and the implementing of the foregoing programme has necessitated the closest co-operation between all Engineering Officers concerned and also between the London Engineering District and the London Telephone Service.

The final operations at the time of cutting out the old exchange and cutting in the new are but the culminating acts in the practical application, over a long period, of many and diverse economic and technical considerations.

The problems arising from the conversion of London's telephone system are many and difficult, but the successful achievements during July, 1929, show that with good will, good temper and good work, these problems can be solved with credit.

GLASGOW TELEPHONE NOTES.

MISS A. McL. Cunningham, Telephonist, Central Exchange, who has been with us seven years, has resigned the service to go to Vancouver.

The staff presented Miss Cunningham with a gold wristlet watch and she carries with her our united good wishes for health, wealth and prosperity in the new country.

On Relaxation and Holidays.

"I've been saving up out of my wages for a year just for this vacation. I intend to spend it like a lady if I never do another one. I intend to get up when I please instead of having to crawl out at seven every morning; and I intend to live on the best and be waited on and ring bells for things just like rich folks do. Now, I intend to have the happiest time of my life. Then, I shall come back to my work and my little hall-bedroom satisfied for another year."—(O. Henry.)

"To the body and mind which have been cramped by noxious work or company, nature is medicinal and restores the tone. The tradesman, the clerk comes out of the din and craft of the street and sees the sky and the woods, and is a man again."—(Emerson.)

"The jug of wine and loaf of bread and Thou in the wilderness business is about as much rest and pleasure to me as sliding down the bumps at Cony would be to President Taft. . . . Give me a big city for my vacation."—(O. Henry.)

"There is moral as well as bodily wholesomeness in a mountain walk, if the walker has the understanding heart, and eschews picnics. It is good for any man to be alone with nature and himself, or with a friend who knows when silence is more sociable than talk. It is well to be in places where man sees all around him what has the same look as it had a thousand years ago. It abates and rectifies the man, if he is worth the process. As the body, harassed with the noxious air of cities, seeks relief in the freedom and the purity of the fields and hills, so the mind wearied by commerce with men, resumes its vigour in solitude, and repairs its dignity."—(Sydney Smith.)

"Let us praise God in gladness and humility for all great and simple joys; for games and holidays in the open air; for the beech trees in spring and the fruit blossom; for the smell of the country after rain; for the green grass and the flowers; for cloud and sun and hills and mountain streams; for all pure comedy and laughter, and for the gift of humour and gaiety of heart."—(Commemoration of St. Francis.)

"Golf."

The definition of a modern fool, according to an acquaintance, whose hobbies are gardening and poultry keeping, is to be a player of ball games, especially that of golf. To hear him is to be persuaded that the golfer is one of life's failures: one of those ineffable men—insensible, brawny—who think that all that matters is to be a sportsman and a good fellow: whose main ambition is to roll silly little balls over the grass into silly tin holes in a smaller number of strokes than anyone else.

Bearing these strictures in mind, I was recently persuaded to play my first game of golf on the occasion of the District Office (annual) competition at Cardross, on the banks of the Clyde, and thus qualify for entrance into the ranks of those who, according to the authority referred to, are "blessed" with an obliquity of understanding.

The desire to see oursels as ithers see us, says G.B.S., makes us the moral cowards that we are; and that other genial Irishman, Sergeant Cassidy, with an even greater perspicuity, tells us it is better to take amoosement from what others think about us and—give it no heed. Therefore I played golf.

I cannot say that I have succumbed to the fascination of the game as yet, but I have learnt that it is extremely easy to send a golf ball in an entirely different direction from that which one intends, or, easier still, to miss it altogether. I learnt also to become absorbed in the business of keeping the head still to keep the eye on the objective, to drive the ball in the way it should go when I did connect, and on the greens to be painstaking——qualities, especially that of a still head, which are not the marks of a low intelligence. I also learnt consistency. Over an 18-hole course my outward score was 90 and the inward score the same, my opponent's being 50-50.

The prize-winners were:—

(1) Mr. W. Campbell;
(2) Mr. J. M. Harvey;

and Messrs. R. F. Gilchrist and T. Rowand, who tied for third place.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

By HARRY G. SELLARS.

(*Continued from page* 188.)

1881, May 14 ... Silvanus P. Thompson published an exhaustive work on "Electricity and Magnetism."

M. Brasseur, of Belgium, supported Hughes' method of preventing induction on telegraph lines.

Baudot obtained a diploma of honour at Paris Electrical Exposition.

Volta Laboratory Association formed by Alexander Graham Bell, Dr. Chichester Bell and Charles Sumner Tainter, for the purpose of studying and elaborating ideas, inventions and discoveries relating to the art of transmitting, recording and reproducing sounds. The capital of the Association consisted of the Volta prize of 50,000 francs, which had been awarded to Graham Bell for his invention of the telephone.

First London theatre—the Savoy—lighted by electricity.

Thomas Alva Edison invented a current-meter.

Electric railway opened in Berlin.

M. Volk & Co. installed the first English electric railway at Brighton.

Telephones introduced into Isle of Man.

1881, Aug. 9 ... Electric lighting first used in mines (at Hamilton, Scotland).

1881, Dec. 3 ... Postal Telegraph Clerks' Association formed at Liverpool with Thomas Morris as General Secretary.

Compass needles in London pointed 18 deg. 33 mins. *west* of the true north.

Angle of "dip" in London, 67 deg. 39 mins.

Special revenue stamps for telegrams discontinued.

Penny stamp available for either postage or Inland Revenue issued. Separate telegram stamps abolished.

Fawcett revision of pay, &c., in the Post Office took place.

1881, Dec. 31 ... Fifteen telephone exchanges in London serving 1,338 subscribers.

1882, Jan. 1 ... British Postal Order Service extended to Gibraltar and Malta.

1882, Jan. ... Postmaster-General expressed the view that in the public interests rival telephone exchanges should not be established in one town.

W. E. Irish patented a telephone switchboard with a rotary switch for establishing communication between the operator and the caller.

J. E. Kingsbury published *The Telephone in Principle and Practice, its Origin and Development.*

A. W. Heaviside devised a metallic circuit system of telephones known as the "North East (Northern)" system.

1882, Feb. 16 George Lee Anders patented a central battery system of telephone working.

(T. F. Purves and J. Fraser also devised central battery systems.)

Edison devised a shunt wound dynamo with a drum-wound armature.

Dr. Hopkinson improved Edison's dynamo and, in collaboration, produced a dynamo for electric lighting, the armature of which could be coupled directly to a steam engine.

Elihu Thomson and Edwin J. Houston produced a dynamo providing a constant current for arc lamp lighting.

Col. R. E. B. Crompton made improvements in Bramme's dynamo.

Ferranti, Ganz, Gramme, Kapp, Mordey, Parker, and Westinghouse devised current alternators for electric lighting.

1882, June ... Sir Charles Bright patented an electrical accumulator of reduced weight, more effective action and simpler construction.

Dr. Fleming constructed a battery with copper and lead, the two separated liquids being sodium persulphide and nitric acid. He also produced a direct reading potentiometer.

Major Cardew invented a "hot wire" voltmeter.

M. Paul designed a direct reading movable coil micro-ammeter.

Kelvin invented an Ampere Balance and an Electrostatic Voltmeter.

G. F. Fitzgerald suggested that a Leyden jar might be used to produce electro-magnetic waves.

Crompton constructed a clockwork regulator for adjusting electric arc lamp carbons automatically, and devised a method of measuring electro-motive force.

Barclay, Boltzmann, Gibson, Silow, Wuellner, Gordon, and Hopkinson measured the inductive capacity of various liquid and solid bodies.

Hopkinson calculated the magnetic permeability of various metals and introduced a formula for calculating the number of magnetic lines proceeding from an electro-magnet.

H. A. Rowland fixed the magnetic susceptibility of Norwegian iron at a figure rising to 366 units, of cobalt 800, and of nickel 494. Ewing found that the magnetic susceptibility of thin soft iron wires went up to 1,300 or 1,400 units.

1882, May 24... Marr and Moseley, of Manchester, patented a granular carbon telephone transmitter with an ebonite diaphragm.

S. Bidwell patented a telephone receiver.

Gurney, Genest and Mix devised telephone transmitters.

1882, July 17 Postmaster-General decided to grant telephone licences to all responsible persons who applied for them, even where a Post Office system was established.

1882, Aug. 9 ... Silvanus P. Thompson and Philip Jolin patented the Valve Telephone Transmitter, the essential part of which resembled a mechanical ball-valve.

1882, Aug. 12 Postmaster-General (Henry Fawcett) did not think there was any possibility of the Government buying the rights of telephone companies.

1882, Aug. 18 An Act of Parliament granted to the Railway Clearing House, acting on behalf of the railway companies, eleven-twentieths of the postage collected upon parcels carried by rail.

Barclay introduced a printing telegraph system using a keyboard perforator and printing the received message in page form.

(To be continued.)

THE

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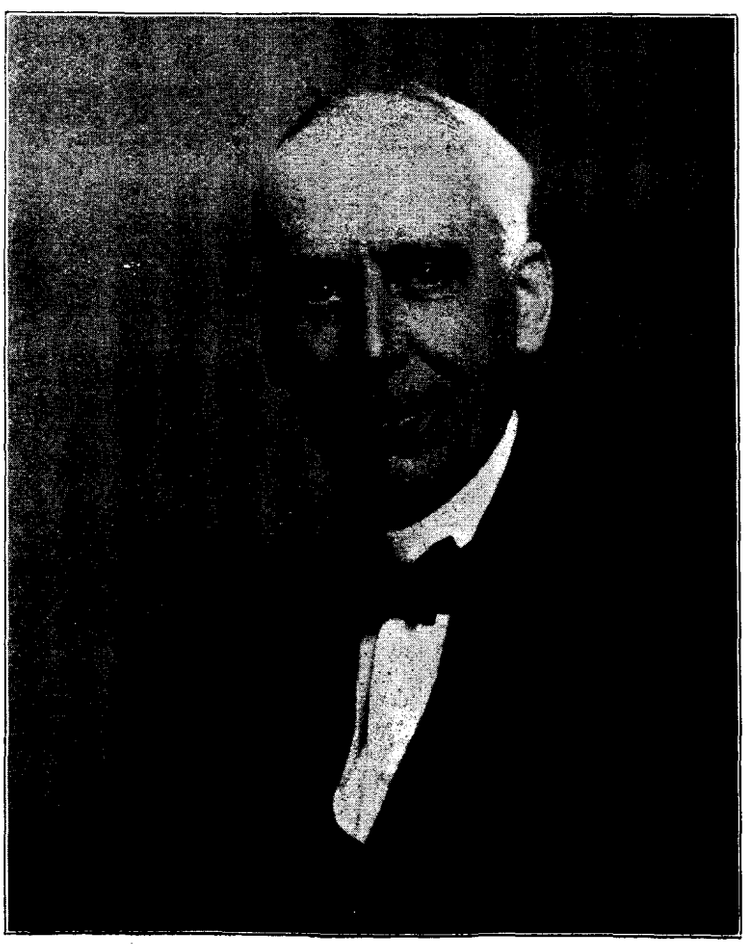
TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXVIII.

MR. HORACE DIVE, M.B.E.



WHEN the Post Office commenced exchange working in London, a number of likely young men on the established clerical grades were selected to fit into the new telephone organization. So in 1905 Dive, who had for 8 years trod the peaceful path of an A.G.D. Second Division Clerk, found himself suddenly an Exchange Manager, called upon to face the cold wind of criticism which inevitably blows upon a public service and reacts on those who administer it.

The Exchange Manager of 24 years ago has grown with the system, grown in experience, in outlook, and in knowledge. That he is now Assistant Controller is the justification for the original selection and a fitting crown to a life of hard work, tempered by an outstanding sense of humour, and guided by a keen mental alertness.

While in essentials telephone traffic questions may change little, methods are ever changing. To keep abreast of the changes is no easy task, and it says much for Dive's adaptability, his easy grasp of affairs and his organizing flair that the transition from manual to automatic working in the London area has become part of the normal day's duty to be taken in one's stride.

His gift of pungent speech, spiced with incisive wit at times a trifle mordant, has been in evidence at more than one official conference and staff society, while his presence, and the easy badinage of which he has an inexhaustible supply are always welcome at social gatherings. The possession of an attractive personality is not the least of his assets.

Has he hobbies? He was a member of the Middlesex County Council for 3 years and is still on its Education Committee. But in case that should seem too much like work to be called recreation, he joined a Golf Club but never plays. When there is an evening at home his children and his garden claim it; a delightful ending to a busy day.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

VIII.—A POSTSCRIPT.

THE *T. & T. Journal* may, I think, justly be congratulated on the series of articles on "How to Improve the Telegraph Service" which has appeared in the last seven numbers. The articles show that men in all departments of the Telegraph organisation are thinking, and thinking constructively, about the future of the service and its needs. Written from different points of view, they reveal a substantial measure of uniformity of opinion. In particular, the contributors are at one in believing that the telegraph service has still a great function to perform, and that the "human material" at its disposal is capable of responding to the highest demands that can legitimately be made of a telegraph service. The complete absence of any note of despondency or defeatism is gratifying. There is, also, a good deal of common ground as to what is wrong with the service and what can be done to make it a better servant of the public.

If I may begin with a word of criticism, I think that the writers, or most of them, are too apt to assume that the responsibility for what is wrong lies exclusively at the door of the administration. It may be freely (even cheerfully) admitted that in past years the administration has made mistakes; and there is no reason in the nature of things why the administration of to-day should be exempt from the general human liability to imperfection. But that liability attaches to the administration neither more nor less than to any other branch of the service. On the face of it, there is something untrue to life in the picture of a telegraph service in which only the administration fails to do its job perfectly. Yet that is the sort of picture suggested by most of the articles. One misses, too, any attempt to appreciate the special difficulties with which the administration has been faced during the last few years. But to this point I will recur later.

The suggestions made by the writers of the articles are many and various, and cannot all be discussed, or even enumerated, within the limits of a single brief article. They may be divided into two categories, according as they relate to the facilities afforded to the public, or to the internal organisation of the service.

To the former category belong suggestions for extended hours of service, for abolition of the charge for telephoning telegrams and the extra Sunday charge, and for reduction of the charge for a registered abbreviated address (which, by the way, another contributor would increase!). The first of these has recently been met to some extent. The others can scarcely be adopted unless the financial position of the service is to be regarded as a matter of entire indifference; and to the unfortunate administrator, however much he may desire to help the telegraphing public, this "hang the cost" attitude is a forbidden luxury.

In the same category fall the suggestions for differential rates for different classes of traffic. Differentiation is suggested on the basis of (*a*) distance, (*b*) speed, (*c*) character. A "zone" tariff has its attractions, but it is not so obviously fair as it appears to be at first sight (a telegram sent over a distance of 100 miles in two transmissions costs much more to handle than one sent 300 miles in one transmission), and it has always been rejected as unsuited to British conditions. The "urgent" telegram has similarly been rejected on the ground that it could not be of much use unless the ordinary service were degraded to a considerable extent. The "deferred" telegram might be a sound scheme if the ordinary tariff were on a paying basis: but as things are we cannot afford to accept telegrams even for transmission in the slack hours at a rate sufficiently below the ordinary rate to attract traffic. This applies also to "travellers' telegrams" and "greetings telegrams," if a reduced rate is suggested (the American Commission proposed "greetings telegrams" at the ordinary rate).

One novel—not to say revolutionary—suggestion is that of using petrol stations with continuous service for telegraph purposes. This idea seems at first sight to be beset with difficulties; but it is not for that reason to be rejected out of hand.

It is common ground among most of the contributors that whatever facilities we offer ought to be well advertised. There is room for difference of opinion as to the value of advertisement for a monopoly service which is long-established, and the existence and uses of which must be familiar to anybody who could ever have occasion to use it. (I am speaking here, as throughout, of the inland service, which is not faced with direct competition such as exists to some extent in the overseas service.) Personally I do not believe that advertisement is likely to have any serious effect on the volume of inland telegraph traffic. But I believe it to be right that the telegraph service should abandon its somewhat Olympian aloofness from the public, and, in particular, that useful facilities which may not be so well known as they ought to be (phonograms and night letters) should be kept in the public eye by modern advertising methods, suitably adapted to the requirements of a Government Department.

To turn now to the second class of suggestions, we have a pretty general agreement that the service is not at present as rapid as it should be, and that it needs a more generous provision of staff and wires. In other words, it seems to be generally assumed that to some extent efficiency has been sacrificed to economy. To this point I will return in a moment, after saying a word about some of the other suggestions which fall under the head of internal organisation.

The suggestion, made by one or two of the contributors, that the telegraph staff should have better prospects is one with which everybody must sympathise. Not only from the point of view of the men and women affected, but from the point of view of the efficiency of the service, lack of adequate prospects of advancement is a thoroughly bad thing. It not only bears hardly on individuals; it inevitably creates an atmosphere in which it is very difficult for the staff to give of their best. But it is easier to see the evil than to find the remedy. A policy of creating higher appointments within the telegraph service for the sole purpose of providing avenues of promotion is indefensible; and the possibility of finding outlets for telegraph staff in other branches of the service, or in other Departments, is limited by the claims of officers already in those other branches or Departments.

A greater degree of specialisation is recognised by some of the contributors as a condition of increased efficiency; and stress is rightly laid on the necessity of thorough training both on the operating and on the engineering side. So far as the question of apparatus is discussed, there is a consensus of opinion in favour of the policy of standardising a minimum number of types, and of adopting the teleprinter to the greatest practicable extent. One of the writers sees advantage in transferring responsibility for the maintenance of apparatus to the Traffic side.

But the principal demand is for more staff and (to a lesser extent) for more wires. The reduction of operating staff through the adoption of the staffing standards, and of delivery staff through the introduction of the "walk" system, and the suspension of a certain number of direct circuits, seem to be regarded as mainly responsible for an alleged deterioration of service. It is here that the difficulties of the administration appear to me to be insufficiently realised.

The inland telegraph service has been worked at a loss practically ever since it was taken over by the State, and markedly so since the sixpenny telegram was introduced. Nobody seems to have worried very much about that while the service was expanding and the national finances were in a healthy condition; but the rapid decline of traffic during the last few years, coming at a time when stringent economy has been required of the public services, has forced the administration into a position in which it could not ignore the deficit and concentrate on the provision of a service of maximum efficiency. No sane person, I think, believes that the deficit can be wiped out with the present tariff; and it is highly doubtful whether

any practicable increase of the tariff would help very much. Anybody fully conversant with the facts would probably agree that—at any rate unless there is an almost miraculous reversal of the traffic curve—the inland telegraph service must continue indefinitely to be carried on at a substantial loss, which can be justified on the ground that (despite any conceivable growth of the telephone system) the business and social interests of the nation require, and will continue to require, a telegraph service accessible to all. But it must equally be admitted that public opinion would not tolerate any marked increase in the deficit The administration is bound to aim at reducing the deficit if possible, or at least at keeping it somewhere about its present level.

"Efficiency" is a relative term. An efficient telegraph service is one that maintains a certain standard; but the standard must be in a sense arbitrary. Obviously, we could give the public a more rapid service than we have ever given if we chose to provide direct wires for very small traffic loads, and to staff telegraph counters, instrument rooms and delivery rooms on a "no-delay" basis. But a service with an inherently unremunerative tariff cannot afford to be so generous. What we have tried to do is to maintain the long-established standard of service—which is a reasonably good one, regard being had to the fact that we aim at equal service for all—while taking advantage of the legitimate opportunities for economy which are offered by technical developments. If we have not wholly achieved that object, we have not fallen short of it—as one of the contributors reminds us—nearly so much as is often supposed. To some extent we have been "let down" by unsuspected weaknesses in our modern apparatus, though it is only right to add that the teleprinter, which is (so far as can be foreseen) the instrument of the future, bids fair to give us a very high degree of stability. Factors of a psychological nature have also intervened. But I believe it to be true that the service is recovering from the set-back which followed the recent revisions of telegraph staff in the large offices, and that, if our performance is judged by what we have done in the past, and not by some ideal standard, or in relation to isolated cases in which an exceptionally rapid service was provided before we were forced to consider so narrowly how much we could afford, there will be found to be little ground for the charge of serious deterioration.

One need not rest content with that. We should all like to give a better service than ever; and improved technique ought to make that possible. But the deficit is a limiting factor. We have to reduce the deficit if we can; at any rate we must avoid a larger deficit. Is an improved service possible within the limits thus set? The recommendations of the American Commission are an attempt to answer this question in the affirmative. In many ways they involve increased cost. Standardisation of apparatus (with consequential scrapping of much that might still be useful); unified control of operating and apparatus; time-stamps and hand-gummers; reduction of supervising areas; regular rest reliefs for telegraph operators; acceleration of delivery in business areas; typewriter reception; publicity and canvassing—these things cannot be done without considerable expense. On the other side, the proposals for a more economical lay-out of large instrument rooms, for a higher degree of specialisation, for higher outputs on the more important circuits (with concurrent abolition of the "carry-over") and for some measure of payment by results are designed to secure savings which will enable the added expense to be borne. I believe that if the recommendations of the Commission were carried out in their entirety (and they are essentially parts of a single whole) the service could be improved without any addition to the deficit, and probably with some reduction (though of course in this connexion a great deal depends on the future trend of traffic and wages). But clearly that object could not be attained if only the measures which cost money were to be carried out. Its attainment demands the co-operation of all the various parts of the telegraph organism in an effort to make increased efficiency compatible with that regard for economy which circumstances dictate. It is scarcely necessary to add that it is in the best interests of the staff, no less than of the administration, to give the public a service of maximum efficiency. L. S.

THE ACCOUNTS BRANCH AND THE CALLING RATE.

BY R. S. GROSVENOR, GLOUCESTER.

THE Accounts Branch is consistently in touch with subscribers at the most vulnerable point—the pocket.

The relationship between the Accounts Branch and the calling rate is, perhaps, not immediately apparent, but it nevertheless exists and is of considerable importance. A rigid system in respect of the collection of quarterly accounts from thousands of subscribers, involving very many thousands of pounds, is essential. The administration of that system, however, calls for the greatest tact, not only in order to avoid the possibility of subscribers curtailing use of the service, but by means of accurate, prompt and courteous treatment in every case, fostering popularity and so encouraging greater use.

To send a subscriber an account is a comparatively simple routine matter, but any query subsequently received in connexion with that account requires very careful treatment. As an example, for a subscriber to write a three- or four-page letter, and to receive a printed postcard acknowledgment to say that the matter is receiving every attention does not create anything like such a good impression or feeling of confidence as a short, carefully worded, duly signed letter. The importance of this point is even more appreciable when a subscriber makes a service complaint in addition to raising a query or seeking information regarding an account.

Correspondence in connexion with deposits requires most careful treatment or undoubtedly a tendency to curtail use of the telephone is engendered. Cold formality tends to "freeze" a subscriber and should be well tempered by the personal element in order to counteract necessary purely formal statements. In a few words, subscribers' confidence should be sought and maintained in order to avoid anything in the form of prejudice with consequent distrust, apathy, and probable curtailment of use. An idea that an overcharge has been made, and paid, rankles and is distinctly dangerous to the interests of the service.

This feeling would be serious for any ordinary business concern; how much more so, therefore, in perhaps the largest business in the world existing for the public service only—the British Post Office.

The standard of accuracy maintained in our accounting system, bearing in mind the millions of transactions that are dealt with each quarter, is surely an achievement of which to be proud. Much can, however, be done by the Accounts Branch to popularise the service. It cannot be too strongly emphasised that care and tact in the treatment of correspondence on all accounting matters is of the first importance.

A very courteous and definite reply to telephone enquiries should be given. Again the personal element enters into the matter and the subscriber should always be left with the impression that the enquiry has been or will be fully and correctly dealt with.

This, of course, equally applies to an interview with a subscriber making a visit for enquiry or information. In this case, a feeling of personal welcome in opening the interview should always be given to *the customer*. During the course of the interview opportunity frequently occurs to sow really good seed by dealing with the business on hand in an expeditious, confident and definite manner so that the subscriber leaves not only satisfied that the case has been correctly handled but with a firm feeling of confidence in the service generally. There is an old saying that in order really to know a person see him in his home. This is also, of course, a truism in business.

A further word with reference to service, &c., complaints received when accounts are paid. Such complaints are, of course, very varied in nature, and range from a subscriber who states he has been intending to bring a certain point under notice for some time to one who has experienced difficulty on the day the account is being paid. There is also that form of complaint made in very general terms, from which it appears that the subscriber is just indulging in a little grumble when required to forward a cheque.

Whether apparently important or not, such complaints should be carefully acknowledged, *at the time the receipt is sent*, and forwarded to the relative section for treatment as expeditiously as possible in order to avoid delay and irritation to the subscriber.

As a Government Department dealing so closely and intimately with the public, it is essential that the best relationship should be maintained.

The question of withdrawal of service is approached with some diffidence, but an article of this nature would not be complete unless such an important point is mentioned. This is a delicate matter, requiring much care, but by tactful handling it is frequently possible to gain a friend instead of making an enemy. The point of view of an officer dealing with accounting matters is all-important.

The prompt collection of an account is not the only essential factor. To do so without in any way incurring displeasure or causing irritation is of equal importance.

In conclusion, to popularise the service and thus increase the calling rate is the duty and should be the motto of every officer in every section of the telephone service. Effort on the part of every branch is necessary.

The problem of the calling rate is not capable of any single solution. Our potential stock of calls is inexhaustible, with facility for speech which even at present is not confined to seas or continents and which will in the not distant future be world wide. What an asset this is to business and social life in general and yet it is not anything like fully realised.

Education in and encouragement of the telephone habit in every phase of life is necessary.

To rent a telephone and *use it* is sound advice in business or private life.

With combined enthusiasm, consistently directed to enriching the life-blood of our service by increasing the calling rate, from the telephonist whose *personality* in her work is so important, the Service Inspector who should be *missionary* as well as emissary, the Contract Officer upon whom much depends to advertise *the great facility and usefulness of the service*, to the officer of the Accounts Branch dealing with the subscriber on the vital question of money, *creating a good impression* by care, discretion and tact, then each will have done his or her best in achieving the desired end.

FOR OUR ADVERTISERS.

Contracts Open.—Melbourne Posts and Telegraphs Department. Sept. 24. Supply of Condensers (Schedule C. 461) (Reference B.X. 5488). Also for supply and delivery of switchboard instruments, test plugs, and sleeves (Ref. B.X. 5541). Latest date Oct. 15.

The above are Department of Overseas Trade references.

This same Department in a Consular report on Roumania (April 1929) gives the following information. The broadcasting station of which the construction was begun last year by a British firm is expected to be ready this summer, and an exhibition of radio apparatus is being held at the present time (August) and will be open until the end of October.

"The restrictions," says the report, "on the import and use of radio apparatus have also been removed, and British manufacturers have now an opportunity of making their goods known on a market where the demand for radio apparatus is likely to increase considerably in the future."

The Railway Authorities have ordered seven radio-telegraphic stations in France and the Postal Administration has some similar orders in view.

J. J. T.

NUMBERS.

By T/SV5.

AND, by "Numbers," we mean of course "Telephone Numbers!" Most people have a number or combination of numbers which they regard as "lucky" and, *per contra*, many people regard the number "13" as unlucky. In the first case a not inconsiderable measure of satisfaction is afforded a subscriber if he can in any way identify his lucky number in the one allotted to his telephone circuit, and, in the second case, instances are not unknown where new subscribers, on being given numbers such as 5413—or any combination containing the fatal 13 (even if the digits total that number), have made urgent requests for the allocation of other numbers without this "undesirable" characteristic.

On a rather different plane are the requests received from subscribers for numbers which have some special significance in connexion with their businesses, e.g., the years in which their firms were established; the street number of their premises (generally taking a repeated form such as 3636); the number of "varieties" manufactured by the firm, and so on.

In pre-automatic days the most-sought-after telephone number was undoubtedly "1." Other single digits were attractive; but the first digit held pride of place. It will be recalled that this was the telephone number of several large London stores. So much importance was apparently attached to this number, that, recorded in the history of the National Telephone Co., is the case of a large universal stores which "went over" to the Post Office because the company would not force a private subscriber to relinquish his number "1" in order that it might be utilised by the stores. The Post Office at that time were in the position to offer the magic number on a P.O. exchange and thereby added a large installation to their system.

Next to the single digits, round hundreds and thousands were generally popular. On a manual exchange such numbers are quite good; although under the "Stile Strip" method of passing numbers they are perhaps at a slight disadvantage as the general rule (one two—pause—three four) takes on an exception in the case of hundreds (one—pause—hundred) and thousands (one thousand without pause).

The introduction of four-figure numbers in London was brought about by (1) the elimination of single and 5-digit numbers and (2) the prefixing of cyphers to two- and three-figure numbers. In this latter connexion it may be of interest to note that although some 40,000 subscribers' numbers were affected, only 29 letters were received by the Controller which could possibly be regarded as complaints or protests against the cypher prefix. This is typical of the wonderful readiness with which the average London subscriber is prepared to co-operate with the Post Office in the acceptance of small—but nevertheless disturbing—alterations which have as their aim the general well-being of the London Telephone Service.

The adoption of four-figure numbers for all subscribers on exchanges within ten miles of Oxford Circus has developed another magical number, viz., "1234." This was regarded by the large Stores previously mentioned as the most attractive substitute for the single digit "1." The first question a subscriber asks when he is notified that a change in his number is pending, is usually: "Can't I have a number that can be easily memorised, such as "1234"? As, obviously, only one subscriber can have the use of that number on any one exchange, pressing claimants find solace in "4321" or other sequences. The next form of number in order of appeal is perhaps the repeated digit, e.g., 3333, 4444. These numbers have, seemingly, replaced the request for round thousands; especially when it is realised that in calling these latter numbers three full swings of the dial are necessary. A form of number which attracts many people is the repetition of the first and second digits, e.g., 3434, 4343, 8181.

It might not be inappropriate to refer here to "Numbering Schemes." The preparation of such schemes for automatic exchanges is necessitated by the need to provide for the accommodation of the four different classes of installations, viz. :—

(1) Single lines
(2) Private Branch Exchange groups of 2-10 lines.
(3) „ „ „ „ „ 11-20 „
(4) „ „ „ „ 21 and over lines.

In the preparation of numbering schemes two main points are kept constantly in mind. (1) The avoidance, as far as possible, of number changes when subscribers are transferred from manual to automatic exchanges, and (2) the equal distribution of traffic over the levels of the first numerical selectors.

On all automatic exchanges in London the following numbers are reserved for special services :—

0001 Monitorial group,
0099 Multi-Coin box reversed Toll calls,
0101 Service Private Branch Exchange group,
1111 Police,
2222 Fire,

and, in addition, the telephone number formed by the numerical equivalent of the 4th, 5th, 6th, and 7th letters of the exchange name.

When a manual exchange is replaced by an automatic exchange bearing the same name, e.g., Holborn, Bishopsgate, Sloane, Western, it is necessary to effect certain number changes in order to meet the requirements of the respective numbering scheme. These changes are mostly due to :—

(*a*) Large- and medium-sized groups having numbers not in the prescribed ranges for 11-20 and over 20 Private Branch Exchanges.

(*b*) Small Private Branch Exchange groups not in the appropriate ranges ; also where the final digit of the primary number ends either in "0" (4860) or is a digit which will not admit of the entire group being accommodated on one level, e.g., 4686-4692.

(*c*) Single-line subscribers in the ranges set aside for 11-20 and over 20 Private Branch Exchange groups.

It is generally necessary to carry out the above changes prior to the transfer to the automatic exchange in order to avoid flooding the "Changed Number" equipment at that exchange. To give effect to these changes frequently necessitates the adoption of "hospital" working, by means of a "paper multiple," at the manual exchange, owing to the non-availability of suitable "physical" spares. A special effort is then made to break down calls for the old numbers before the transfer to automatic working.

A point of interest in connexion with the numbering of the circuits forming the 11-20 and over 20 Private Branch Exchange groups on automatic exchanges is the utilisation of the directory number, together with a stroke and a suffix number, to identify each circuit in the group, thus : 1234/1, 1234/2, 1234/3 and so on. The individual lines are numbered in this manner at the Private Branch Exchange and faults are reported to the exchange by the Private Branch Exchange operator accordingly. The respective registers at the exchange are similarly marked.

A final word regarding "Night Service" numbers. These are non-auxiliary numbers and are associated with the main group numbers of the 11-20 and over 20 Private Branch Exchange groups in order that, during the period the Private Branch Exchange is unattended, incoming calls may be connected to particular extensions. As is well known, the operating rule, under manual conditions, is to test the number asked for and, if available, establish connexion. If the number is in the middle of a large auxiliary group the same rule applies, and this procedure permits of the utilisation of different numbers in the auxiliary group for night service. But, as is also well known, it is not possible to select a particular line in an 11-20 or over 20 group on an automatic exchange. This will be readily appreciated by the preceding description of the stroke suffix method of numbering individual circuits in these groups. The only method by which selection can take place is to tee single numbers on ordinary or 2-10 final selectors to the bank contacts of the 11-20 or over 20 unit, so that when these single numbers are called a particular line in the auxiliary group will be selected, or, if engaged, the busy tone returned.

Somebody asked the question "What's in a name ?" I know not ! But I do know that there is "heaps" in a number when it happens to be that of a telephone circuit.

REVIEWS.

"*Radio Telegraphy and Telephony*" *by Rudolph L. Duncan* (*Director of Radio Institute of America*) *and Charles E. Drew* (*Instructor in Radio and in Charge of Electrical Division, Radio Institute of America*). *Published in this country by Messrs. Chapman & Hall, Ltd. Price* 37*s.* 6*d. net.*

This book (950 pages) has been prepared as a complete text book for students of wireless communication. The first 190 pages are more or less introductory in character and deal mainly with matters not exclusive to radiotelegraphy and telephony. They are lucidly written and abound with analogies and illustrations which should help the student to steer a straight course through the intricacies of the subject. The next chapter of 100 pages deals exclusively with valves (described here as in all American publications as vacuum tubes), and is followed by Chapter XII of 120 pages about Receiving Circuits. Rectifying circuits, loud speakers, antennae, and commercial broadcast and telegraph transmitters all receive full treatment in the latter half of the book ; and, although we rather grudge the 60 odd pages occupied by spark and arc transmitters which are rapidly becoming obsolete, we realise that the authors in the present state of change were bound to make some reference to systems which may remain in use here and there for another ten years. Indeed, these chapters and some sections of the appendix seem to indicate that the book is largely intended for the use of ships' operators *in posse* and *in esse*. If that be so it may account for the fact that the authors have dealt quite inadequately with what is perhaps the most successful recent development in long-distance high-speed telegraphy, "Beam transmission," which they dismiss in 30 lines of type with the remark that "the success of beam transmission no doubt will be decided by the practical investigations now being carried on." Similarly, they have ignored altogether the Transatlantic Telephone Service, and the abstruse technical problems which have been met and overcome in connexion with the development of that commercial service. We think these omissions are to be deplored in a book bearing the imprint of Anno Domini 1929.

We notice on page 926 that water is classified amongst the oils. This is obviously a proof-reader's slip, as it would puzzle our American cousins to get "well oiled" on that commodity.

Generally speaking, the book has been written for American readers, and the Appendix furnishes much information in tabular form of the characteristics of American valves, &c., which would probably be of little use to the British public ; and the demand in this country will in our opinion be largely confined to those interested in wireless development on the other side of the Atlantic.

"*International Lists of Radioelectric Stations.*"

As a result of the International Radiotelegraphic Conference at Washington in 1927, the International Office of the Telegraph Union at Berne has revised the list of radiotelegraph stations in consultation with the various telegraph administrations throughout the world.

The new edition of the lists is published in five volumes, as follows :—

Vol. I.—Fixed and land stations.
Vol. II.—Stations performing special services.
Vol. III.—Ship stations.
Vol. IV.—Aircraft stations.
Vol. V.—Broadcasting stations.

Volume II comprises 7 sections, i.e. (A) Direction-finding stations, (B) Beacon stations, (C) Stations sending out time signals, (D) Stations sending out regular meteorological bulletins, (E) stations sending out notices to mariners, (F) Stations broadcasting press messages, (G) stations sending out medical advice, calibrated waves, &c.

In Volume III the names of ship stations are given in alphabetical order instead of being grouped according to countries as in previous editions. Similarly, in Volume IV aircraft stations are given in the alphabetical order of their call signs instead of being grouped by countries.

In Volume V we find the first comprehensive list of broadcasting stations, with their wavelengths, geographical positions and hours of service.

The new volumes are much handier than the old combined list and the sub-division and rearrangement of the stations makes reference to the lists much simpler.

"Aufgaben aus der Fernmeldetechnik (Telegraphen-, Fernsprech- und Funktechnik) nebst Lösungen." By K. Buttler. Published by Franz Westphal, Lübeck. Price 11.50 *Rm.*

THIS volume contains 500 Problems with Solutions in the technology of telegraph, telephone and radio communications. It is written by a teacher of wide experience, a Postdirektor in the Telegraphentechnisches Reichsamt, and one who has a clear perception of the needs of students in dealing with theoretical and practical questions relating to electrical communications. We have not before seen a book of this kind which is so well calculated to assist candidates for examinations in these subjects, not to mention the large number of students who have become interested in the science of electric signalling on account of the development of broadcasting. In this book the German reader has the advantage, but it is to be hoped that a translation will be made available for English-speaking students.

THE ST. JOHN AMBULANCE ASSOCIATION : LONDON POST OFFICE CENTRE (POST OFFICE AMBULANCE CORPS) : PRELIMINARY ANNOUNCEMENT.

CLASSES to be held in the Post Office Ambulance Centre during the coming Winter Session.

Controller's Office, Cornwall House	First Aid on Thursdays, commencing end of September. Lecturer : Dr. Hellier.
Holborn Exchange ...	First Aid, starting early in October.
G.P.O. South	Home Nursing, starting in November.
Croydon Exchange ...	Home Nursing, on Fridays in October.
Victoria Exchange ...	First Aid, first week in January.
Central Telegraph Office	Home Nursing on Thursdays, commencing for lectures on Oct. 24, at 5.30 p.m., and for practices one month previously.

We hope as many as possible will attend these courses and lectures, and so secure an efficient knowledge of Home Nursing and First Aid.

Further details will be announced later, and particulars of enrolment can be obtained from : Miss B. L. Webb, Branch Secretary L.T.S. Exchanges, Trunk Exchange, Carter Lane, E.C.4, or Miss C. M. Stephen, Cornwall House, Waterloo Road, S.E.1, or Miss A. L. Yitton, Branch Secretary Central London Telegraph Office, K. Division, St. Martin's Le Grand, E.C.1, or from Miss E. K. M. Meeser, General Secretary, Women's Section, Cornwall House, Waterloo Road, S.E.1.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at June 30, 1929, was 1,786,865, representing an increase of 10,995 on the total at the end of the previous month.

The number of stations at June 30 last, in London, England and Wales (excluding London), Scotland, and Northern Ireland was as follows :—

	No. of Stations at June 30, 1929.
London	638,884
England and Wales (excluding London) ...	966,538
Scotland	159,288
Northern Ireland	22,155

The growth for the month of June is summarised below :—

	London	*Provinces.*
Telephone Stations—		
Total at June 30	638,884	1,147,981
Net increase for month	4,405	6,590
Residence Rate Subscribers—		
Total	154,108	242,285
Net increase	1,261	1,836
Call Office Stations (including Kiosks)—		
Total	5,647	21,273
Net increase	21	678
Kiosks—		
Total	1,353	5,366
Net increase	30	133
Rural Party Line Stations—		
Total	—	10,548
Net increase	—	25
Rural Railway Stations connected with Exchange System—		
Total	17	1,146
Net increase	—	12

The total number of inland trunk calls dealt with during April (the latest statistics available) was 9,539,701, representing an increase of 1,050,409, or 12.4%, over the total for the corresponding month of the previous year.

Outgoing international calls in April numbered 43,002 and incoming international call 45,829, representing increases of 11,113 (34.8%) and 10,227 (28.7%) respectively over April 1928.

Further progress was made during the month of July with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Beckenham, Edgware, Fulham, Maida Vale, Reliance (all automatic).

PROVINCES—Ardwell, Bridge of Cally, Cerne Abbas, Closeburn, Gamlingay, Hampden Row, Island Magee, Lumsden, Mouswald, Newbrough, Pirnmill, Welford-on-Avon (all rural automatic),

and among the more important exchanges extended were :—

PROVINCES — Cleckheaton, Henley - on - Thames, High Wycombe, Minehead, Stockport (automatic).

During the month the following additions to the main underground system were completed and brought into use :—

Port Erin—Belfast cable,

while 68 new overhead trunk circuits were completed, and 75 additional circuits were provided by means of spare wires in underground cables.

TELEGRAPHIC MEMORABILIA.

PROBABLY our readers have long since noticed with what persistency the American press insist upon crowning Edison as the first inventor of the incandescent electric lamp, despite the very very clear evidence that the honour should be given to Swan.

The *Electrician*, in referring to the relaying of the King's Thanksgiving Service to Canada, asserts that this latter notable achievement resulted in many letters of congratulation being sent to the National Broadcasting Company of *America!*

Our esteemed contemporary fears that, "unless we are very careful, and unless we change our methods of showmanship, the credit for the Beam system, the establishment of world-wide communication by radio-telegraphy and telephony, the invention of the radio valve itself will soon be handed over to America."

It will be recalled that the service between Great Britain and Canada was so good that the service was passed on to Australia over the Canada-Australia beam and then successfully re-broadcast in Australia itself.

About the middle of last month the Wireless Correspondent of the *Daily Telegraph* wrote as follows: "I understand that protracted negotiations between the Baird Television Development Co. and the General Post Office, in connexion with experimental television hours from the B.B.C. stations, have not yet reached a definite conclusion, but it is believed that the Baird Company will be offered revised facilities consisting of about three hours a week for experimental purposes, instead of the forty-five minutes offered by the B.B.C." Up to the time of going to press there has been no indication of the acceptance of this new offer by the Baird organisation, but the offer is doubtless a sequel to the reply of Mr. Lees-Smith on July 23 regarding this matter, as recorded in *Parliamentary Questions* hereunder.

Television is making certain progress in the U.S.A. One of the scientific features of the Fourth of July celebrations in that country was the demonstration at the Bell Laboratories, West Street, N.Y. City, where the "first colour television transmission was publicly exhibited."

It is true that the actual screen was no larger than a postage stamp and the distance transmitted was limited to the length of the laboratory, but the movements of a young and gaily dressed American girl, who "acted" by waving "Old Glory" and the "Union Jack," munched a melon and showed in succession a multi-coloured ball, a pot of geraniums, a pineapple, flowers, &c., all of which, it is stated, were very effectively received in all their variety of colour and shade, although up to the present it is only possible for one person at a time to view the tiny picture.

While on these interesting developments of "still-life" and "television," it is worthy of a full quotation that *The Electrical Review* in a recent issue records the following use to which the Royal Meteorological Society has placed the Fultograph system in the expeditions of the Society into the tangled forest of the origin and nature of atmospherics:—

"An enormous amount of research into the origin and nature of atmospherics has been done in recent years by the radio research station at Slough, and the station is now to make use of an entirely novel method of recording them. The Royal Meteorological Society has arranged with the B.B.C. for special transmissions after the normal picture programmes and they will be picked up by Fultograph receivers installed for the purpose at recording stations in various parts of Europe. The transmissions will not take the form of pictures; instead there will be sent out a series of straight lines, both horizontal and vertical, forming a grid or network. When an atmospheric occurs deformation of the straight lines will take place to an extent depending upon the intensity of the interference. It is hoped that by this means it may be possible to make records which will afford valuable data for research into the intensity, duration and origin of individual atmospherics. Since the drums of all receiving apparatus, wherever situated, will be synchronised, it will be possible, by comparing the results obtained in different places, to determine the range at which an individual atmospheric can cause interference and the intensity of such interference in different localities.

Parliamentary Questions, &c.—On July 9 Viscount Wolmer asked the Postmaster-General whether he intended to carry out the policy of the late Government with regard to the sale of the Imperial cables and the leasing of the beam services.

Mr. Lees-Smith said that the contracts between the Post Office and the Imperial Communications Co. providing for the transfer of these services were signed before the present Government assumed office. Those contracts were conditional on the requisite percentage of assents being received from the shareholders. The requisite percentage had been received and the principal agreements therefore automatically became binding.

On July 8 Mr. D. G. Somerville asked the Postmaster-General if he would state the mileage and the cost per mile of underground cables already laid in this country and the annual average provision for new work of this nature; and what were the reasons for the slow replacement of overhead by underground wires.

Mr. Lees-Smith said that the total mileage of underground telephone and telegraph cables in this country was 33,500. The cost per cable mile, which depended on several factors, varied from about £500 to over £3,000. The average annual provision for new underground cable work for the next two or three years was about £4,000,000. In areas where the telephone density was high, subscribers' circuits were provided by means of underground cables throughout; in other areas poles carried and distributed the wires beyond the point where it was economical to provide underground cables, but cables were substituted for the overhead wires as soon as such a course was justified. In the aggregate, out of a total of eight million miles of wire, 6,800,000 were already underground.

On July 9 Dr. Spero asked the President of the Board of Trade whether he was aware that the increased royalties on wireless receivers had placed the wireless industry in a serious position; and whether he would make an inquiry with a view to amending legislation.

Mr. W. GRAHAM said that some representations had been received as to the effect of a recent decision of the Court on the manufacture of wireless receiving sets. As to the second part of the question, a committee was recently appointed by the Board of Trade to inquire whether any amendments in the Patents and Designs Acts were desirable.

On July 16 Mr. Lees-Smith, Postmaster-General, informed Mr. Day that there were now three radio-telephone circuits in commercial operation between Great Britain and the United States; the transmitters were concentrated at Rugby. The total number of calls passed over those circuits during the three months ended June 30 last was 3,881.

The P.M.G. also recently announced in the House of Commons that up to March 31, 1929, the beam radio-telegraph services of the Post Office had earned gross receipts of £813,100 at a cost of £538,850.

Among other matters dealt with by the Postmaster-General in the House of Commons just before it rose was a statement to the effect that it had been decided to establish a public photo-telegraphic service between London and Berlin for the transmission by telegraphy of pictures, photographs, documents and other similar matter. It was anticipated that the service would be opened in the early autumn.

Specifically, on July 23, Mr. Lees-Smith. informed Major Church, on the question of the development of Television in this country, that he (the P.M.G.) "had received representations both from the Baird Television Development Company and from the British Broadcasting Corporation concerning the facilities offered for the use of a broadcasting station for experimental transmissions of television. He was considering those representations, but he was not yet in a position to state the result.

According to *World Radio*, European progress regarding broadcasting in 1928, as evidenced in the official returns collated by that journal, has shown, generally speaking, a most gratifying state of affairs. The number of actual licenceholders in Europe (excluding Russia) rose from 5,897,000 to 7,163,000.

The actual *percentage* increase, however, is lower than in 1927, traceable to a somewhat stationary state of affairs in Czecho-Slovakia. the I.F.S., Italy and Norway, and a slight slowing up in Sweden.

The personal impression gained so far in the current year is on the whole a steady increase, as in 1928. Only in Germany has one noted any considerable decrease, which country recorded, on July 1, a falling off of no less than eleven thousand licences, up to the end of June.

There does not appear to have been any official attempt to explain this decrease, although when we read that the Berlin police have been keeping a very vigilant eye on the increase in numbers of wireless aerials, and have issued orders for their removal in several cases, we have obviously touched *one* cause, if not the complete list of causes, for the remarkable drop. A test case has been fought out in the Berlin courts, where the police contended that "a large number of aerials would produce a marked disfigurement of the city." The Court, however, decided that "only when a disfigurement already existed" could action be taken and that the police "could not act when it was merely an aesthetic probability." It will be interesting to see the figures in, say, three months' time !

In Poland, however, there has been an increase of over 13,000 during the first three months of the year, and this despite a known, but undiscovered—as yet !—number of "pirates."

By the way, in Roumania the broadcasting administration has authority not only to confiscate any unlicensed apparatus, but any person who even erects an aerial on behalf of the owner of such apparatus is punished equally with the pirate himself. The maximum penalty is a fine of £13 or imprisonment for a period not exceeding two years. In Spain, with a minimum licence fee of 8*d.* per quarter for a crystal set and just over 3*s.* for a valve installation, there, no more than in England, has it been possible to entirely eliminate the broadcasting thief.

Only in Formosa is the existence of the "pirate" unknown. According to a report from H.M. Consul at Tamsui, there are no restrictions on the use of receivers there. As the Japanese are anxious to popularise the service no fee is charged for listening in, and the Bureau of Communications is therefore able to report "no pirates" !

Personal.—The knighthood conferred on the Engineer-in-Chief, Col. Sir T. F. Purves, O.B.E., in the last New Year's Honours list for special services to the Post Office is still fresh in the memory.

To this is now added, in a more restricted sphere, his election to the presidency of the Institution of Electrical Engineers. One can be confident that the genial president-elect will grace the honoured position, no less than his many other responsible roles.

News comes of Frank Sherrard and Miss Carter, both of T.S., having been visited in The Deepings, Rutlandshire. Both Frank and his sister-in-law, it will be recalled, were on the Inland Staff, C.T.O., and both are now living in a "charming old-world cottage," so I am told. Adam Gordon is still making some slow improvement.

Things Heard.—That, a new monthly magazine is about to appear in Paris in connexion with the Posts, Telegraphs and Telephones. It will be known as *Le Relais,* and is to be issued under the auspices "of Les éditions du Torrent," a small limited liability company largely supported by the French Post Office employees.

That, Mr. Herbert, in his new book, expresses an unmistakable liking for the French Baudot brushes.

That, the American slogan, "Don't write—Telegraph," is now a popular song in the U.S.A.

The Cynic.—A cynic is a man who knows the *price* of everything and the *value* of nothing.—*Oscar Wilde.*

J. J. T.

CORRESPONDENCE.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

DEAR SIR,—It is perhaps safe to assume that the Department has already laid the foundation upon which to erect the telegraphs publicity machine. Let us hope so, for the organisers will admit that much ground must be covered, from John o' Groats to Land's End and the whole of Northern Ireland; so that it is not too early to set the cogwheels in motion.

The series of "How to Improve the Telegraphs" articles, have been of absorbing interest to the writer and many others, but when discoursing upon a publicity item too much attention, it would appear, has been paid to business clientele.

It will, of course, be the duty of an officer who is to take charge of an industrial, or commercial area, tactfully to convey an idea of the benefit which industry will derive from using an up-to-date service more extensively. But his job will be easy compared with that of his colleague who has been detailed to canvas in residential districts. And it is this field which as yet has not been explored by the Department, and which, the writer maintains, will contribute very largely towards saving the Telegraphs.

For a striking analogy to prove the above, we have to go no further than the huge commercial concerns, which, realising that catering for the masses is more profitable than retaining the custom of a favoured few, have adopted the instalment system for the convenience of those who cannot afford to pay "cash down."

To the business man a telegram is a necessary adjunct (our aim is to make it more so) but to a very large percentage of the social community, it is an event of such rare occurrence as to cause a considerable flutter in many households.

It is perhaps no exaggeration to say that in the matter of business it is more difficult to approach the average member of the artisan, or working classes, than that of commercial people. But that is all the more reason why we should tackle them, for are not difficulties made to be overcome ? The world has no room for those who shirk the battle, for he who can cry "Victory" is a most satisfied man, and the more strenuous the fight the greater his satisfaction.

I have hinted that, to those who comprise the majority of the populace, a telegram is an unnecessary item in the social order of things, but they have relatives scattered all over the United Kingdom. To them, in many instances, compiling a letter is a laborious and thankless task, and this trait has been responsible for losing touch for many years with, perhaps, brothers or sisters or even parents. If they could only afford to send a few telegrams simply conveying the fact to those "up North" that everything is alright with those "down South," the Department would be indirectly assuming the position of social godparent, and incidentally "lining its pocket," for the result would be an overwhelming increase in traffic.

But this will never happen whilst the proletariat (horrible word !) have no alternative from "twelve words a shilling." Would it not be worth while to do as some have already suggested and inaugurate a deferred inland rate with the proviso of certain conditions ?

Just about a century ago, James Morrison was employed as an errand lad in a Fore Street warehouse. By the time he had reached middle age he possessed a fortune so large that after all expenses had been deducted for the upkeep of the huge business which he now controlled, an enormous surplus was left which was put to many and varied uses, including the purchase of ample demesnes. Mr. Morrison died in October, 1857, leaving behind a matter of over four millions, and the secret of his success lay in the fact that he was one of the earliest among mercantile men to realise that small profits bring quick returns, placing his merchandise within *everybody's* reach, he reaped the benefit. If it is proposed to institute a house-to-house canvas in residential districts, the question as to time and day must be given very careful consideration. A publicity officer, or canvasser, will anticipate anything but a standard duty if he is out to make things "go." A knowledge of human nature will be of great value, and the necessity for excluding official atmosphere will soon be made more apparent here than in an industrial centre.

One must be very careful not to leave an impression with these people that they have been conversing with a very important public official who may feel a slight increase in the size of his head at being called "Sir," as is very probable in these circumstances. Rather should he gain their approval by adopting an attitude of a genial and unassuming nature.

Mr. Archibald is dubious about any increase in social traffic; but I most respectfully submit my very humble opinion that attractive features and publicity among the masses may entice *all* classes to make such use of the telegraphs as to reverse the trend of events, and make the system a serious competitor to that of the Telephone—or, at least, place the two services on a par.

If the mountain won't come to Mahomet . . . !

W. T. L. (*C.T.O.*).

C.T.O. NOTES.

Promotions.

MR. G. T. ARCHIBALD, Traffic Section, Secretary's Office to Assistant Controller; Messrs. F. Sparks, W. A. Lock, Assistant Superintendents to Superintendents (Lower Grade). Messrs. G. H. Baker and T. H. Wright, Overseers to Assistant Superintendents; Misses G. E. Sutton, M. Veats, M. W. Lambert and E. A. T. Targett, Telephonists to Assistant Supervisors, Class II Telephones.

Retirements.

Messrs. E. Cooper (Assistant Controller), H. Almond (Higher Clerical Officer), J. Rees and A. E. Bowden (Superintendents, Lower Grade), P. Diggins and L. S. Page (Assistant Superintendents), F. R. Foster, W. H. Lane, M. S. Jackson and S. H. Townsend (Overseers), W. A. Cox, F. W. Martin, S. E. Barrett, H. W. Bastable, E. G. C. Reay, W. S. Roberts and C. J. Nelson (Telegraphists); Misses M. McLaren and L. E. F. Carr (Supervisors), A. M. Messeder and R. A. Battersby (Telegraphists).

Obituary.

We regret to learn of the death of Mr. H. E. Cullum who only retired from the post of Superintendent in April last. It is understood that Mr. Cullum had just finished a game of bowls when he collapsed and died. To his widow we extend our sincere sympathy.

C.T.O. Veterans.

The Summer re-union of the C.T.O. Veterans was favoured with delightful weather for their river trip to Hampton Court and back to Richmond. All thoroughly enjoyed themselves and are looking forward to the announcement of the completion of arrangements for some form of re-union during the Autumn.

Sports.

The C.T.O. Sports and Garden Party held a successful meeting at Chiswick back in July. Glorious weather prevailed and the races, together with some attractive side-shows and dancing to the music of Leonard Coombs Orchestra, helped the company present to pass an enjoyable time. Mrs. Stuart Jones, who presented the prizes, was supported by Mr. Stuart Jones; Mr. D. M. Ford and Mr. A. Faull, and we were pleased to see Mr. J. Y. Bell and Mr. L. Simon from the Secretary's Office in attendance. The London Telephone Service won the Ladies' Invitation Race. The Mile Championship is now held by Mr. Sowden, Cable Room, Mr. A. Pritchard of the "D" Division won the 100 Yards Handicap, Miss M. Badderley, Central Hall, winning a similar race for the ladies.

The Cable Room also have held a very successful Sports Meeting at Chiswick recently and Mrs. Stuart Jones presented the prizes. Mr. Sowden won the One Mile Handicap.

Cricket.

The Centels beat the Secretary's Office on July 11. Scores: Centels 179 for 3; Secretary's Office 60. On July 25 the Centels won the game with the W.C.D.O. Scores: Centels 161 for 8; W.C.D.O. 128.

Flower Show.

The C.T.O. Amateur Gardening Association held a successful Rose Show recently. In addition, occasion was taken to have the Annual Floral Gift Day, and the numerous bunches of flowers were divided between the London and Garrett Anderson Hospitals. A collection resulted in £1 10s. being forwarded to the latter for the supply of flowers for the C.T.O. bed. Mr. E. J. Piercey was the most successful exhibitor.

OBITUARY.

MR. A. A. PARSONS, STORES DEPARTMENT.

THE unexpected death of Ambrose Parsons, three years before the time at which in normal course he would have retired, has robbed the service prematurely of a conspicuous figure. There are many men who command the respect of their colleagues for the qualities which make for efficiency of the harder sort, there are many who gain esteem for their character, but there are not many of whom it can be said that they have won the love of those with whom they have mixed in the official world. Ambrose Parsons was one of these few. His was a personality of singular charm and graciousness, which found expression in a remarkable way in his dealing with men and affairs even in the unromantic business of the Stores Department of the Post Office. He never failed to look upon those with whom he worked, particularly his juniors, as men and women first, and cogs in a big machine only secondly. In all the non-official activities which grow out of the life of a big Department he took a great interest, and one of his congenial functions was to represent the Stores Department on the Committee of the Post Office Clerks' Benevolent Fund.

Outside the official world he had very active literary and artistic interests and he will be missed by a wide circle of friends. A little quixotic and unconventional, but essentially sane and large-minded, he attracted and held the regard of some of the leaders of the intellectual and social life of our time, and with his gentle and tolerant spirit, was a link between them. The funeral service on Aug. 7 at the old Parish Church, Chiswick, under the shadow of which, on the Mall, he had lived for many years, was attended by a large number of mourners, and from his own Department there came the Controller, the Vice-Controller, and representatives of all grades.

DEATH OF MR. S. O. ALLEN.

THE Post Office Telephone Service has suffered a severe loss by the death of Mr. S. O. Allen, late District Manager of the North-Western District, which took place in a Liverpool nursing home on Wednesday, June 19.

Mr. Allen's devotion and loyalty to the service were tempered by a pleasing personality and genial disposition which endeared him to his colleagues and the staff who served under him, and his death at the comparatively early age of 51 has left all who knew him with a deep sense of personal loss.

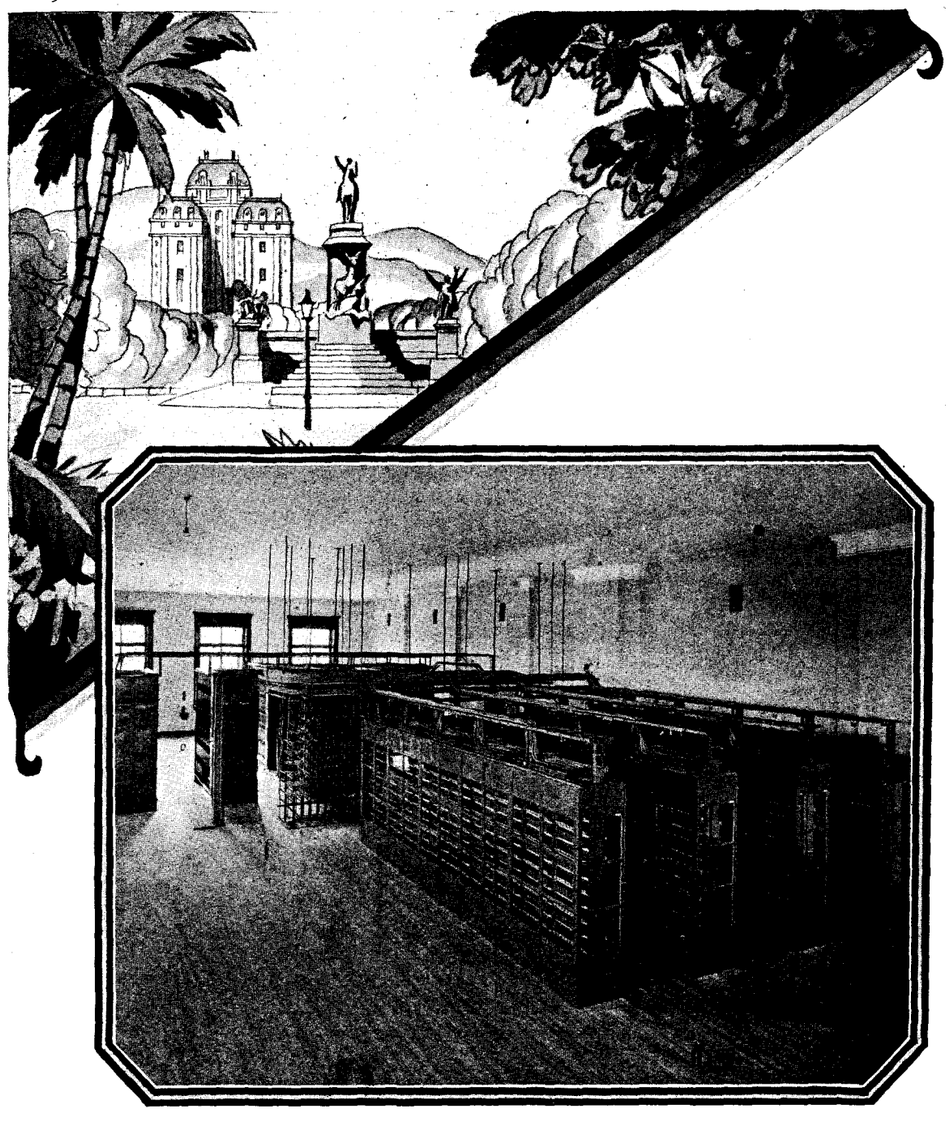
Prior to his appointment as District Manager of the North-Western District in January, 1926, Mr. Allen's official career was spent mainly in Birmingham and Southampton, but his work as one of the executive of the Traffic Officers' Association for many years was known and appreciated by telephone traffic men throughout the country.

The funeral took place at Birmingham, on Saturday, June 22, and in addition to the family, relatives and personal friends, there were also present Mr. R. Morgan, Traffic Superintendent (representing the Surveyor and Telephone Staff of the North-Western District), Mr. P. Currall (District Manager, Birmingham), Mr. A. L. Barclay (District Manager, Chester), Mr. C. W. Piggott (Traffic Superintendent, Birmingham), and Mr. J. Henson (late Postmaster of Lancaster). An unusually large number of beautiful floral tributes were forwarded, including wreaths from the Surveyor and Assistant Surveyors, North-Western District, Staff of the North-Western Telephone District, Preston, Superintending Engineer and Staff, Preston, many Head Postmasters, District Managers, District Office and Traffic Staffs, with whom Mr. Allen had been associated, colleagues of the Secretary's Office, G.P.O., London, Telephone Traffic Officers' Association, and the Federation of Post Office Supervising Officers.

In the following note of appreciation Mr. A. E. Coombs expresses the feelings of all whose privilege it was to know Mr. Allen.

"S. O. Allen was one of that limited band of practical idealists with which humankind is blessed. He was, moreover, guide, counsellor and friend to his co-workers in the service, and was ever ready to help and encourage his fellow officers. To many of the recruits to the ranks of the Provincial Traffic Staff he may be known more by repute than by personal acquaintance, but that does not alter the fact that he did much for them, and for the rest of his colleagues during the past decade. From 1916 onwards to his promotion to the District Managers' grade in 1926, he was an active member of the Traffic Officers' Association and was responsible, with his fellow executive members, for the splendid pioneer work which was carried out during that period, the results of which are seen and appreciated to-day and therefore need no eulogising here. It can be said with truth that our departed colleague 'spent himself doing good,' and that his death will create a gap, and leave a wound that time alone will lessen and soften.

"In addition to his official and 'associational' activities, Mr. Allen was possessed of a charming personality which made and kept many friendships. To be counted his friend was to be brought in a circle within which it was a privilege and honour to move. Truly that part of the world in which he moved, lived, and had his being is very much the poorer by his loss."

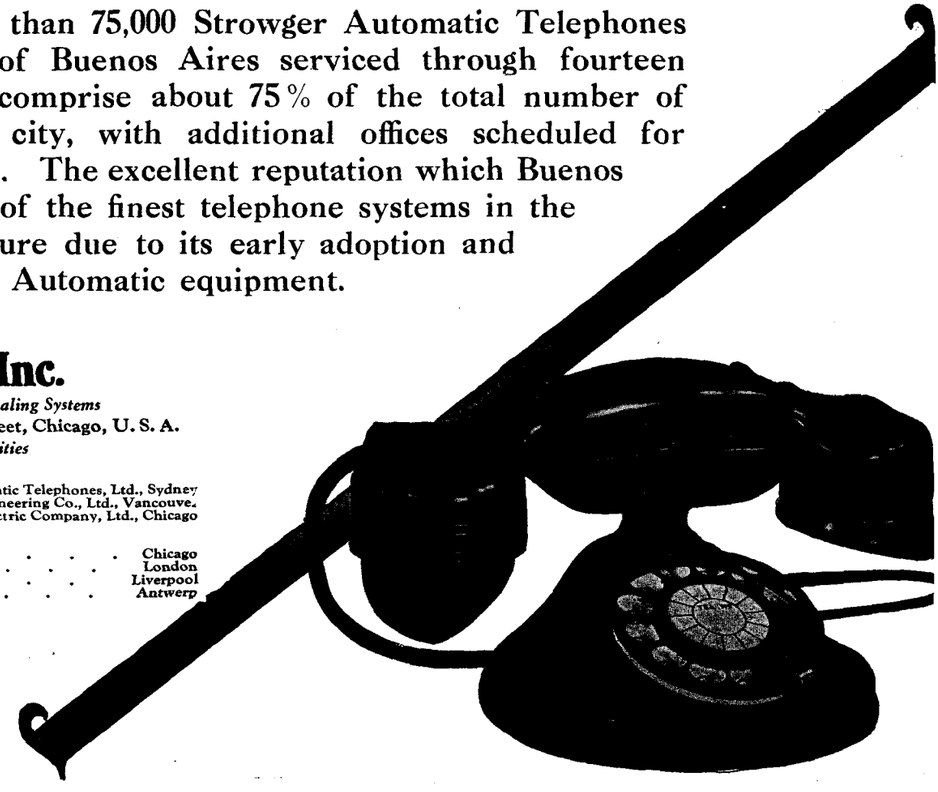


A view of the Barracas Office in Buenos Aires showing some of the Strowger Automatic telephone equipment. Since this picture was taken, substantial additions of automatic equipment have been installed in this office, due to increased demands for service in its area.

Buenos Aires Makes Rapid Strides in Telephone Development

IN 1919, the United River Plate Telephone Company introduced the first Strowger Automatic telephone equipment into the Buenos Aires network. The decision to gradually convert this premier city of South America to Strowger Automatic working was made only after the company's highly successful experience with this system in the cities of Cordoba and Rosario during a six year period prior to 1919.

At present there are more than 75,000 Strowger Automatic Telephones in operation in the city of Buenos Aires serviced through fourteen automatic offices. These comprise about 75% of the total number of telephone stations in the city, with additional offices scheduled for conversion at an early date. The excellent reputation which Buenos Aires holds as having one of the finest telephone systems in the world is in no small measure due to its early adoption and consistent use of Strowger Automatic equipment.



Automatic Electric Inc.

Manufacturers of Strowger Dial Telephone and Signaling Systems

Factory and General Offices: 1033 West Van Buren Street, Chicago, U. S. A.

Sales and Service Offices in All Principal Cities

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For Canada	Independent Sales and Engineering Co., Ltd., Vancouve.
Elsewhere	The Automatic Electric Company, Ltd., Chicago

ASSOCIATED COMPANIES

American Electric Company, Inc.	Chicago
International Automatic Telephone Company, Ltd.	London
Automatic Telephone Manufacturing Company, Ltd.	Liverpool
The New Antwerp Telephone & Electrical Works	Antwerp

STROWGER AUTOMATIC

The
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Managing Editor - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

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A YEAR OF JUBILEE.

IN August, 1879, some nineteen months after the first public telephone exchange in the world had been opened at New Haven, Connecticut, the first telephone exchange in Europe was working at Coleman Street, London, with about a dozen subscribers. In the September of the same year exchanges were opened at Faulkner Street, Manchester, and Lombard Street, London, and in October in Liverpool and Edinburgh. In each case these exchanges started with eight to twelve subscribers, and in most cases they had increased to several hundreds by the end of the year. Exchanges at Birmingham, Sheffield, Glasgow and Bristol were also opened late in 1879. These dates, we believe, are as accurate as the most careful investigation can render them. Old readers of this *Journal* will remember that we have had much correspondence on the subject of the first exchange in Europe. The honour has been variously claimed by Manchester, by the Edison Company's exchange in Lombard Street, London, the Coleman Street Exchange above mentioned, and by a system established by Mr. David Graham in Glasgow, which was probably a private wire system. As the Telephone Company of London (with which the Edison Company subsequently became amalgamated as the "United Telephone Company"), held the Bell patents, there is every probability that they were in a position to open an exchange earlier than their sub-licensees, and the opinion that Coleman Street was the first exchange established in this country is held by the principal surviving telephone pioneers who remember its existence in the August of 1879. The evidence of the *Manchester City News*, of Sept. 13, 1879, "a telephone exchange is *about* to be opened in Faulkner Street" is pretty conclusive of this contention.

What has done much to complicate a simple question is the confusion by historians and paragraphists of the date of the formation of a telephone company (which usually at once proceeded to deal in private lines) with the construction and opening of an exchange—a vastly different matter. For example, the *Daily Mail*, in a recent article on "50 years of Telephones," after referring to the Coleman Street Exchange, says: "But Liverpool had an exchange earlier, in a barn-like building, in which sat the first 'hello' girl." The Lancashire Telephone Company was certainly formed in Liverpool in August, 1879; but the first exchange in that city was not opened until the October of that year, nor did, we think, the first "hello" girl sit at it. The earliest exchanges, as our readers know, were operated by boys and the employment of girl operators was not *universal* until 1889. They were, however, well-established in Liverpool and London by 1883 and 1884, as is evidenced by pictures in the *Graphic* and *Electrical Review* of young ladies in "bustles" seated at the switchboards of those cities.

Whatever points may be in dispute, it is certain that 50 years ago in September 1879 there were exchanges in existence in London and Manchester with less than 50 subscribers between them, and that within 18 months of its inception the London telephone system had increased to 8 exchanges with about 1,000 subscribers' lines. The 50th anniversary of the system is, we think, worthy of a modest commemoration in this paper. The small bodies of subscribers who could to their astonishment and delight converse satisfactorily with the dozen subscribers joined up to their exchange have grown to some 1,845,000, who can communicate not only with one another but with about 90% of the telephone stations in the world. Familiarity with the achievements of 50 years of telephone progress has perhaps blunted our sense of the marvellous, but some of the recent developments of the art have certainly gone far to put a fresh edge upon it.

HIC ET UBIQUE.

THE series of articles on "How to Improve the Telegraph Service" has provoked much discussion, as we hoped that it would, and we are pleased to publish in this and the succeeding number of the *Journal* supplementary and unsolicited articles on the same subject from two officers of the British telegraph service and from one of our foreign colleagues. But the series as planned ended with our last number; and it is appropriate, therefore, in the present number to review the whole series. Mr. Simon, Assistant Secretary in charge of the Inland Telegraph Branch, has been kind enough to undertake the task in an article which he modestly calls a "postscript." Mr. Simon congratulates the *Journal* on the series; we pass on these congratulations to our contributors, to whom the praise belongs. The articles clearly show that the telegraph service, though it has little cause for complacency, has every reason for hope.

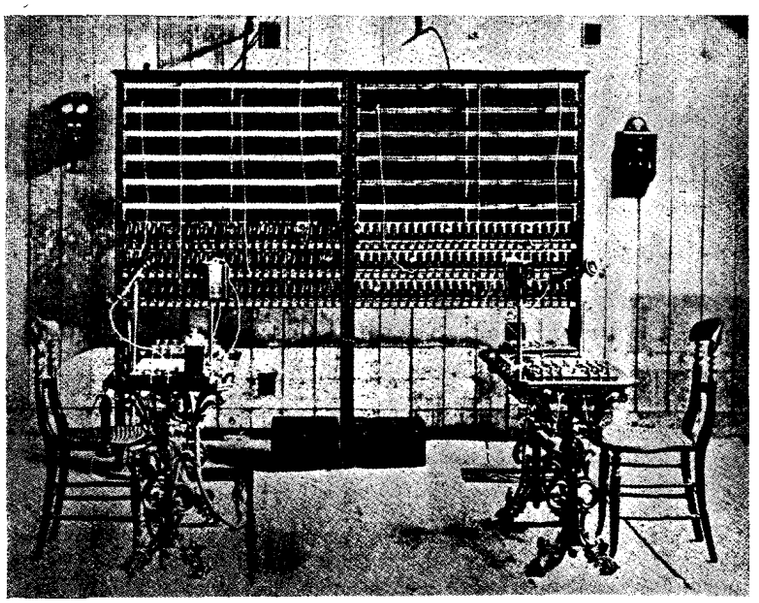
Further extensions of the overseas telephone services took place in August. The Anglo-Finnish service was extended as between

London and the fourth Finnish zone on the 22nd. On the 26th the transatlantic service was extended to the Isle of Man, Belfast, and Dublin; and on the 28th Italy (Milan only for the present) was admitted to the transatlantic service.

We have received a copy of *A.T.I.* (*Annuaire Téléphonique International*) published in Copenhagen. This enterprising work is a European telephone directory classified according to trades. The introductory matter (information concerning European and transatlantic telephone services, &c.) and the headings are in English, French, and German. The book includes an extremely useful list of charges from practically anywhere to anywhere else in Europe (that is, of course, between places in telephonic communication with one another). It is well printed and produced.

Another foreign publication for which we have nothing but praise, is the *Länderkarten des Europäischen Fernsprechnetzes*, published by Verlag Europäischer Fernsprechdienst, Berlin. This is an atlas containing maps of the trunk telephone system of every country in Europe, showing all the cable routes completed or planned, brought up to the May of this year. It is invaluable to all interested in inter-European telephony and costs only 2 marks.

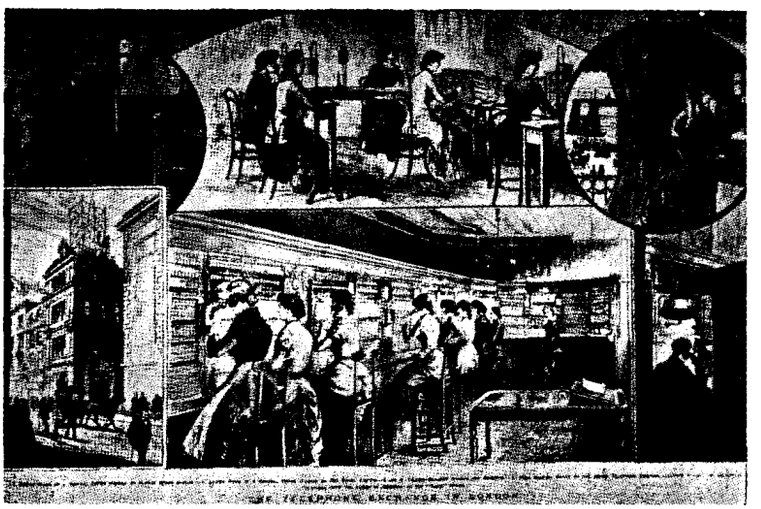
The fiftieth anniversary of the opening of the first European telephone exchange has given rise to much discussion in the press and has called forth many opinions and reminiscences from early subscribers. The quotation from the *Manchester City News*, to which we refer in our editorial, seems to settle Manchester's claim, and Mr. Bennett's letters and quotation from the *Electrician*, 1879, contained in our June and September (1925) issues effectively disposed of Glasgow's. There is still a little obscurity about the



THE EXCHANGE AT 36, COLEMAN STREET, LONDON, 1879.

priority of the Coleman Street and Lombard Street exchanges in London. The late Mr. T. Fletcher, and Mr. C. J. Phillips (happily still alive), who were both chief engineers of early telephone companies, and who should be in a position to know, were certain that the former was working in August, 1879. The latter was officially opened in September, and in his work on "The Telephone," Mr. J. E. Kingsbury gives the following list of first subscribers: (1) Messrs. Parrish, (2) Pullman Car Association, (3) Messrs. Renshaw, (4) Col. Gourand, (5) Equitable Insurance Co., (6) Messrs. Waterhouse, (7) The Edison Telephone Co., (8) Messrs. Kingsbury, (9) Messrs. Anderson, (10) *The Times*.

The Times on Sept. 6 1879 remarked "that telephonic communication has at length become an accomplished fact in the City of London," and says elsewhere, "there are ten favoured spots



TWO LONDON EXCHANGES IN 1883 (FROM "THE GRAPHIC"), SHOWING GIRL OPERATORS AT WORK. BY THIS TIME THERE WERE AT LEAST 15 EXCHANGES IN LONDON and 3,195 SUBSCRIBERS.

at which this privilege can be obtained" (i.e. those just mentioned). This looks as though *The Times* was not aware of the eight or so subscribers' lines working on the Coleman Street Exchange; and it seems probable in the case of those early exchanges that the companies did not give publicity in the press to their opening with a mere handful of subscribers, but waited until they had a respectable number of lines working. In fact these exchanges were never born, but like Topsy they just "growed." Mr. Kingsbury is of opinion, for instance, that Lombard Street was working before its official opening with 10 subscribers on Sept. 6. The Telephone Co. (the Coleman Street firm) had about 200 subscribers by Dec. 24, 1879, and the Edison Co. (Lombard Street, afterwards Queen Victoria Street) 172 by the following February, when each company had 3 exchanges working.

Mr. Baldwin, in his comprehensive "History of the Telephone in the United Kingdom," gives the names of those "among the first" subscribers on the Coleman Street Exchange: (1) Harvey, Brand & Co., (2) W. C. Quilter, (3) J. S. Forbes (L.C.D. Rly.), (4) Croll (Wool Exchange), (5) G. Chubb & Sons, (6) Saml. Dobree & Sons, (7) Marine Ins. Co., (8) G. & R. Dewhurst, (9) Ashurst, Morris & Co., (10) Dent Bros. & Co., (11) Quilter, Ball & Co., (12) Smith, Payne & Smith, (13) Emile Erlanger & Co. It will be seen that the traditional number of 8 has grown to 13; but it is evident that the foregoing were not all "original" subscribers. Mr. G. Chubb, for example, after writing to *The Times* on Aug. 19, asking when London would get a telephone service, wrote again on the 21st saying he was pleased to find that one company had "got it at work," and thanking the officials of the Telephone Co., Ltd., for showing him the arrangements.

In the various reminiscences recorded in the press there is a tendency to confuse private lines, which were developed much earlier, with exchange lines. The Telephone Co., Ltd., was registered in June, 1878 and installed numerous private lines before it opened its first exchange. One subscriber remembers talking from London to Brighton in 1881, although the London—Brighton trunk was not actually opened until the end of 1884. Such is the material from which the historian of the telephone has to glean his scanty evidence.

THE TELEGRAPH SERVICE.

I.—BY AN ENGINEERING OFFICER.

[*The following is the first of two supplementary articles received on the subject "How to Improve the Telegraph Service." The Editing Committee accepts no responsibility for the views expressed in this series of articles.*]

AN attempt by a minor grade man, engaged in a restricted sphere of work, to state a case for "The Improvement of the Telegraph Service" must of necessity be limited, and will in all probability be made with a degree of bias.

From experiences gained over a number of years in the Central Telegraph Office certain definite conclusions may be arrived at. The first and foremost which, in the writer's opinion, has proved detrimental to the best interests of the service is the indefinite method of control which exists where two or more sections of the service are involved. Whilst fully appreciating the difficulties to be surmounted there appears to be an urgent necessity for complete control under one head. The present arrangement does not foster that co-ordination so necessary to an important public service. Border-line duties must necessarily exist under any telegraph system; it should be an essential, however, where duties of an engineering nature are apparent, that only officers fully trained in that particular branch of the work should be employed upon them.

For some considerable time the alleged instability of apparatus has been a byword in most large offices. This, it would seem, is more attributable to method of control than to actual instability. The line of demarcation being such a fine one, it is difficult to determine where one duty ceases and the other begins. Experience has proved that apparatus placed under the care of an efficient mechanic and maintained solely by him gives a far greater standard of efficiency than apparatus which is at the mercy of the many and varied to do their best or worst upon as the case may be. Therefore, under efficiently trained maintenance engineers, considerable time and expense could be usefully saved by the rapid detection of the causes of trouble. To ensure that this class should be an economic grade, a commercial and manipulative training would be necessary, but only as a secondary and not as a primary training. In conclusion on these points: A Controller of Telegraphs, with traffic and engineering assistants responsible to him for their respective sections, would be in possession of a more efficient machine than is available at present. Of any utility service, it has become common public practice to look upon everything connected with it from two standards, i.e., bad and indifferent, and unless due care is taken this practice will develop inside the service as well as out.

As a matter of fact, in most things telegraphic there is a quality and stability which, if used in the correct way, would be difficult to equal in any branch of the outside commercial world. The failing appears to be in not carrying out a definite line of policy. The workmanship and quality used in the construction of telegraph apparatus is second to none, although it should be borne in mind that there is a vast difference between constructional adjustment and practical working adjustment. Much delay could be avoided by the appointment of highly specialised maintenance men to perform this class of work under traffic conditions. The policy of converting out-of-date apparatus to modern design is to be deplored—it is without doubt false economy. The usage of so many different types of apparatus throughout the service is indicative of the indecisive methods applied: both from a manipulative and maintenance standpoint it is bad. During recent years an attempt has been made to stabilise universally the Booth-Wilmot keyboard for general use on busy circuits. The chief grievance, from a manipulative point of view, is the unequal resistance of the keys. Although this may to some extent be eliminated, it cannot, with the present design, be entirely avoided. The only available alternative is to fit the operator to the machine and allow him or her to become thoroughly acquainted with its peculiarities. A competent typist has difficulty working on a strange typewriter, the keys of which, in contrast to the perforator, are of almost equal resistance; therefore it would seem that the constant change of operator is not sound. An analysis of the foregoing indicates that a definite policy on the selection and construction of apparatus is required, a thoroughly reliable test of apparatus by specialists under traffic conditions, and a method of allocating traffic points to the same individuals.

MAINTENANCE.

The practice adopted in most of the larger offices for dealing with faulty apparatus leaves much to be desired. The diagnosis is not arrived at quickly enough, with consequent delay of advice to the maintenance staff. The remedy for this has already been suggested.

There is an insufficient means of proving and testing faulty apparatus, and the question of spares needs serious consideration. The present workshop system of maintenance exchange, involving so much transportation and unnecessary waste of time for minor repairs and overhauls, should be abolished. A modern workshop sufficiently large to accommodate the necessary staff is required, geographically situated to ensure immediate replacement of faulty apparatus. A systematic overhaul of apparatus would ensure greater efficiency than running it to a standstill. Greater care and attention should be paid to the training of maintenance staff. The departmental policy requiring skilled men to acquire knowledge of so many branches of work is unfair both to the men and to the department.

ADVERTISEMENT.

During recent months large numbers of engineering employees have been discharged. It would be well to attempt to carry out the Government policy in alleviating unemployment by engaging some of these men on the erection of advertising signs, electric and otherwise, in various parts of the country.

Imagine the commercial value of an electric sign along the front of the Central Telegraph Office, and similarly at other large and small offices.

There is adequate talent and ability inside the service for the formation of an advertising section, which would, incidentally, absorb some of the redundant staff of the manipulative grade. "Advertising pays," so why delay this all-important branch. Phonograms, being an arm of the telegraph, should be made more widely known. The collar of the telephone transmitter in all public call boxes could be put to good use as an advertising medium placed immediately under the eye of the public. Private subscribers' 'phones could also be used where no objection is raised. Many and varied are the facilities for advertising, which, of course, must be common knowledge.

FINANCE.

Of the wider issues involved, no attempt will be made by the writer; finance, although not entirely outside the normal ken, is intricate enough to make one wary. Sufficient is it that the amount taken weekly by any employee in the telegraph service is not so unnecessary or over-abundant to cause an absence of interest in the welfare of that service.

TELEPHONE DEVELOPMENT STUDIES.

BY W. R. BURGESS AND A. R. LEWIS (*Manchester*).

IN the May 1928 issue of the *Telegraph and Telephone Journal* there was published a very interesting account, in the form of a paper by Mr. Maclure, of the Evolution and Practice of Telephone Development Studies. The present writers, who have been engaged for over a year in the clerical work of development studies, that is, in the translation of the material gathered by Field Officers into the form necessary for presentation to Headquarters for criticism and approval, desire to offer a few observations on the clerical side of the work.

The Block Survey.—A brief outline should perhaps first be given of the method by which the telephone requirements of an Exchange area are forecasted. Mr. Maclure has explained how the Field Officer, armed with six-inch map, service instructions, and note-book, surveys the area, makes judicious enquiries, and by means of an intelligent use of his imagination, restrained and fortified by knowledge of service instructions and past experience, records in his note-book particulars of the various classes of property (known as tenancies) existing in the area, and of the changes which he considers will occur during the course of the next 6, 11, and 21 years.

An Exchange area is divided into D.P. areas, i.e. small blocks of a size suitable for being served from a distributing pole. A small Exchange area may contain 20 D.P.s and a large one as many as 2,000. These blocks are numbered serially on the maps carried by the Field Officer, who surveys each block separately and enters in his note-book complete particulars of the tenancies existing and anticipated. At the end of the field work the note-book contains information on the following lines :—

Block No. 101.

Classification Code.	*Existing Tenancies.*	*Tenancies anticipated at* 6 *years.*	11 *years.*	21 *years.*	*Notes.*
O3	1	2	3	4	
O4	2	2	2	2	
S3	3	3	3	3	
S4	4	4	4	4	
R4	6	12	12	12	
R5	50	45	40	40	
S2	—	—	1	2	

Then follows the clerical work. The particulars are extracted from the note-books on to summary forms (C.M. 40) so that the separate items of each class of tenancy are collected from the many D.P. blocks and brought to one total for the whole of the Exchange area. A separate set of forms is required for the summarising of each of the four columns (Existing, 6, 11, and 21 years' tenancies) shown in the example. Multiplying factors, representing the anticipated telephone value of each class of tenancy, are applied to the various totals in each class, both in respect of each D.P. area and of the Exchange area as a whole, so that on completion the Summary forms show :—

1*st Set.*—Number of Existing Tenancies of each class, and total number of Lines of all classes (in one total) for each D.P. area and for the whole of the Exchange area.

2*nd Set.*—Number of Tenancies of each class, and number of Lines of all classes, anticipated at 6 years in each D.P. area and in Exchange area as a whole.

3*rd Set.*—Similar to 2nd Set at 11 years.

4*th Set.*—Similar to 2nd Set at 21 years.

Such, in brief, is the method of the Block Survey. Can it be said that finality has been reached, or is the system capable of improvement. So far as the Field Officer's part is concerned, the system would appear to be sound. Various unforeseen events could occur to mar his findings. A new industry might arise suddenly or an old one disappear. The recent action of the Manchester Corporation in passing plans for a 17-storey skyscraper may herald a movement which will involve a new development study of Manchester in the not distant future. Such happenings, however, are well provided for in existing instructions. All Contract Officers are required to bring under notice any town-planning scheme, estate development or abnormal building development which they may observe in their canvassing duties ; and every block survey forecast has to be reviewed quinquenially. But so far as the clerical work is concerned, it is the opinion of the writers that very great improvements can be effected.

Existing Telephone Value.—Assuming the field work to be done efficiently, the most important link in the development study is the multiplying factor, and the foundation for sound multiplying factors is the actual existing telephone value of the various classes of tenancy in the area under survey. But no provision is made, in the standard method* of carrying out a development study, for ascertaining and furnishing to Headquarters the existing telephone value of the various classes of property. This shortcoming has been remedied at Manchester by the following method :—

In the Field Officer's note-book an additional column is ruled for indicating the existing lines against each entry of existing tenancies, and when the latter are extracted on to the summary forms, the relative lines are extracted at the same time (by using divided columns). From the resulting totals the actual existing telephone value of each class of tenancy in the Exchange area is obtained.

Summarising Tenancies and Calculating Anticipated Lines.—The method of summarising the tenancies existing and anticipated, and of calculating the resulting lines has also been modified in practice at Manchester with the result that an enormous saving has been effected in the number of forms C.M. 40 used, and in the time required for achieving the desired result. So great is the difference in this method compared with the standard system that in one study, a block survey of the Manchester City and Central area, the number of forms C.M. 40 required was 17 instead of 700, a saving of 97%. In a small study of, say, 150 D.P. areas the number of forms C.M. 40 required would be reduced from 68 to 7. This result is achieved as follows : The summary forms are used for collecting the items from the note-books and bringing them to totals for each class of tenancy in the Exchange area, but not for working out the details of each D.P. area. The latter operation is more easily and concisely worked out in the note-books by providing extra columns, as shown below.

This alteration obviates the necessity of using a separate line on the form C.M. 40 for each D.P. area, and the columns of the form may now be filled with as many figures as they will hold. It is usually found that one form will suffice for the extraction and summarising of the whole of the particulars concerning existing tenancies and lines contained in a full note-book. When the totals of existing tenancies have been obtained the figures are carried to the top of a fresh form, C.M. 40, and the tenancies anticipated at 6 years are found simply by the addition and subtraction of new buildings and demolitions. Where there is no change in column (3) compared with column (2) the figures are ignored. (In the standard method every figure must be extracted and every D.P. area given a separate line on the Summary form.) In a similar manner the tenancies anticipated at 11 years are found by carrying the 6-year totals to a fresh form, C.M. 40, and adding or subtracting the differences between columns (3) and (4). Finally, the tenancies anticipated at 21 years are obtained from the 11 years totals by a similar operation.

Avoiding Duplication in Note-Books.—Following on the adoption of the foregoing reform a method was devised of making the extraction of the figures relative to the 6, 11 and 21 years periods much simpler. Instead of filling in each of the columns (1) to (6) in his note-book (see examples) a Field Officer is required no longer to utilise columns (3), (4) and (5), except for new buildings and demolitions. It had been found that in the vast majority of cases the figure for Existing Tenancies, also for those at 6, 11 and 21 years, was the same. To repeat the same figure in the four columns is not only an unnecessary duplication of work on the part of the Field Officer, but it makes the extraction of the figures much more difficult. It is the differences which are required, and if there is no difference then the presence of a figure is merely confusing. Liability to error is reduced because every figure now inserted has to be taken into account, so that instead of being mixed up in a mass of figures they stand out conspicuously. Time is saved because, instead of every line bearing a figure and having to be scrutinised, only a fraction of the lines now contain figures. In applying the multiplying factors, of course, the Existing Tenancy figure is used for all the periods if no subsequent figure appears in the following columns.

Block No......

Street, &c.	*Classfn. Code.*	*Existing Tenancies.*	*Tenancies anticipated at* 6 *years.*	11 *years.*	21 *years.*	*Existing Lines.*	*Lines anticipated at* 6 *years.*	11 *years.*	21 *years.*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

* The standard instructions are under review (Ed. *T. & T. J.*).

Furnishing Result to Headquarters.—The next modification of the standard system occurs in furnishing the result of a block survey to Headquarters. In this connexion the following forms are required: C.M. 20 (classification of tenancies, with the multiplying factors adjudged to each class of tenancy for each of the forecast periods); C.M. 40 (containing a summary of the various classes of tenancies at each of the forecast periods) and C.M. 31 (showing past actual growth of lines, future anticipated lines at various dates, population, &c). Under the Manchester System the information contained in forms C.M. 20 and 40 is presented on a more comprehensive typed form which gives, in addition, the existing lines relative to the existing tenancies, and the existing telephone value of every class of tenancy in the Exchange area. As the next columns of the typed form show the multiplying factors used to forecast the anticipated lines, it can be seen at a glance what basis exists for the factors decided on.

New Comprehensive Form C.M. 31.—It is considered that it would be an advantage if the whole of the information required by Headquarters were embodied in one form, and a specimen form combining the present forms C.M. 20, 40, 31, and the additional information given in the typed form referred to above, has been submitted.

Population.—The calculation of population figures offers some difficulty, as Exchange areas rarely coincide with the administrative boundaries for which population figures are given in the Census returns. The most reliable method appears to be that of multiplying the "occupied tenancies" by the "occupancy value." The latter figure is obtained by taking from the Census returns the population and the separate dwellings of the administrative areas comprising the bulk of the Exchange area and finding the ratio. The figure obtained is, of course, for 1921, since which time some improvement has been made in the housing situation, and our ratio will generally need some slight modification. Then with regard to the population in 21 years' time, it seems safe to assume that all housing shortage will have been met, in which case the number of persons per house will be further reduced. Factors such as the influence of birth control, the general tendency towards the decrease in the number of persons per family, &c., are ignored. Their effect in the past is, of course, embodied in the ratio obtained from the Census returns. Considerable divergency has been found to exist between various areas, ranging from an occupancy value of 5 in a mining district to 3.78 in a district partly covered by farms.

Schedule of Telephone Values.—A very interesting outcome of the adoption of the foregoing modifications has been the compilation of a schedule giving the following particulars respecting each Exchange area recently studied:—

(1) Number of Existing Tenancies of each class.
(2) " " " Lines " " "
(3) Telephone value per tenancy " " "
(4) Population.
(5) Information similar to (1), (2), (3), (4) for the combined exchanges.

This schedule enables a Contract Manager to see at a glance whether any particular class of tenancy in an Exchange area is showing an average return in telephone development. If there is a considerable lag and no known reason exists to account for the deficiency there would appear to be a case for an intensive canvassing campaign in that particular class with some likelihood of success.

The ratio of doctors to population, of shops to residences, &c., can be seen as regards the district as a whole and as regards particular Exchange areas, and a study of the schedule from this angle would provide valuable information for testing the soundness of the development allowed in new studies.

It would also appear that if similar information were furnished to Headquarters in all development studies, valuable data could be compiled concerning the position and possibilities of telephone development. It may be objected that differences are bound to exist in the telephone development of different districts, and that there would be no value in making a comparison. Differences must exist, true; but if they are considerable, there is a prima facie case for asking why. A satisfactory explanation of a deficiency may be readily forthcoming. If so, good; but if a satisfactory reason cannot be found, it is thought that the enquiry should be pursued until either the missing customers are obtained or it is clearly demonstrated that they cannot be got.

INTER-DISTRICT CRICKET MATCH.

ON June 18 a team from the District Manager's Office, Sheffield, visited Nottingham, where a cricket match took place under ideal conditions on the Y.M.C.A. ground on the banks of the Trent, adjacent to the famous Trent Bridge Cricket Ground. The match resulted in a victory for Sheffield, the scores being as follow:—

District Manager's Office, Sheffield 131 (S. B. Townsend 42, C. V. Gaughan 42); G. F. Findley took 5 wickets.

District Manager's Office, Nottingham 48 (T. Mortin 16); Townsend and Gaughan each 3 wickets.

The return fixture was played on Aug. 15, on the ground of the Hallam Club. The visitors in this case gave a better account of themselves than on the occasion of the match at Nottingham, losing by two runs only.

District Manager's Office, Nottingham 75 (T. Allen 27); Gaughan took 8 wickets.

District Manager's Office, Sheffield 77 (C. V. Gaughan 24, E. Gregory 20); G. F. Findley took 5 wickets.

RECEPTION FROM SOUNDER BY TYPEWRITER.

BY W. T. L. (*Central Telegraph Office*).

THREE years ago, in the course of an article on "Typing from Sounder," that appeared in these columns, the writer advocated the adoption of one or more circuits at concentrator points for reception from sounder by typewriter, pointing out a few of the advantages gained thereby. The idea was criticized by one who, now an overseer, commands, and has for long years commanded, the greatest respect of the staff. But, misapprehending my statements, the gentleman in question instanced the failure of the "try-out" some few years previous, when a whole division was equipped with machines for the purpose—a fact which I had already commented upon.

I therefore wish to emphasize that, at the time of writing, I only suggested the system as a means of assisting with the reception of duplicate copies—such as press, or heavy pressure of work on a few concentrator circuits.

My critic incorrectly assuming that I suggested wholesale introduction, asserted that the idea would be impracticable owing to the noise of the machines. In fact, I pointed out the why and probable wherefore by referring to the advantage in this respect that cable company telegraphists had over those at the C.T.O. I therefore intended to convey the impression that such circuits should be segregated from other morse circuits; and placing them on a separate row in close juxtaposition to the control board would have sufficed.

Now, however, it is presumed that in the very near future every morse circuit will be similarly equipped and all messages will be transmitted by typewriter.

When one gets used to it, the system is much more simple and easy than most people imagine. Even the most dubious of receiving clerks will find that this is so, for it matters not how fast the transmitting clerk at the distant station may be sending, he or she will find that the difficulty will be to prevent themselves from completing words before the signals have formed the letters.

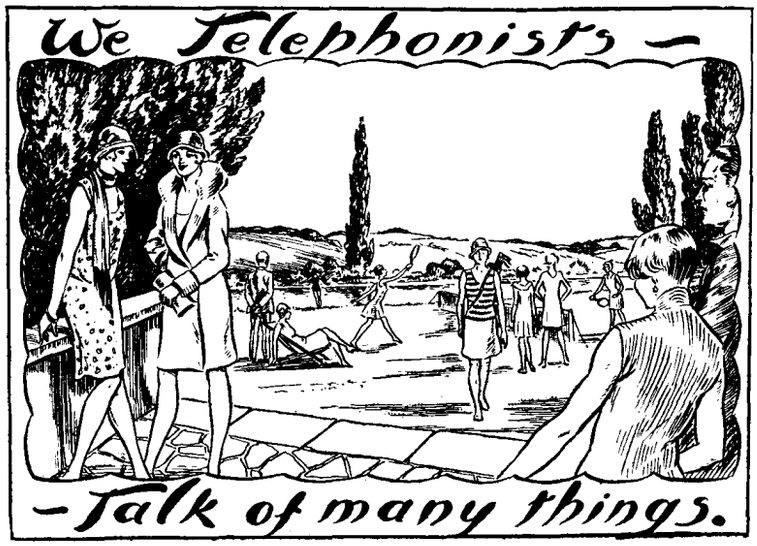
It is concluded that sounder-boxes will be reconstructed to that of the "gaspipe" pattern, and here it would be convenient to mention that, as one who has had much practical experience at both types of boxes, the principal item to remember is—concentrate on the sounder, and, if an ordinary typewriter is used, ignore as much as possible the noise of the machine. In the writer's opinion a standard sounder-box and ordinary typewriter would ensure most efficient training in the school.

The following points will be worth noting when taking up a position at a "live" circuit:—

(1) See that the movement of the roller-bar will not be impeded by any instruments, such as relays, rheostats, or resistance boxes.

(2) Always test the machine for good and clear impression.

(3) Test the spacing bar and lever, &c.; so as to ensure smooth and comfortable working.



The Oldest Inhabitant.

THE path leaves the road and climbs up a winding route on the edge of a field to meet a wood set on the top of a hill. Then it breaks off sharply to the right and, keeping to the edge of the slope, it skirts the wood. You may, if you wish, pause here and look down across the valley. If you did you would notice a faint curl of smoke from a tiny hidden hamlet and the square top of a church tower. You would remember that, lower down, a stream fringed with rushes and wept over by willows meanders through pleasant fields and that presently, leaping into life, it trips and sparkles down an aisle of trees like a rustling bride hastening to her lover. Beyond, as the land rises again, you would see the dark pines with here and there a break of a gravel pit. You might suppose, if you thought of them at all, that they were amphitheatres made specially so that men might sit to watch the play of nature—the contest of light and shade, the graceful movement of trees and rippling corn, the race of sun-flecked cloud, the glory and might of the sun and the pale mystery of the moon.

I had paused and was feasting my eye, just as you might have done, when I became aware of the approach of an old man. He was only slightly bent and he walked, not slowly but contentedly and as of a purpose. He was rustically clad and he carried a stick more, I judged, from habit than for use, for he seemed still sound of limb. His whiskers were such as are rarely seen "in the flesh," shall I say; the sort that figure in the conventional pictures of the farm labourer complete with oleographic grand-daughter. He greeted me with a cheery good-evening and said he was just going to revisit the scenes of 40 years ago—where he "used to do his courtin'." And the remark was accompanied with a prodigious wink and a poke in my ribs. Then, he said, he hoped to call on some of his old cronies—that is, if he could get so far—and have a chat and a drink and a smoke. I passed him my pouch, and, taking a modest dip, he told me of his sons and how they had come back from the war—except one—and of his dog and how "her suffered from rheumatism and couldn't walk fur now" and how he could do better than she although he was seventy-nine. He asked me where I was going and whether I knew the way. I described the route I proposed to follow and he winked again and told me it was a lovers' walk. He chuckled and twinkled and then said suddenly, "I didn't tell her I was coming. I didn't tell my wife. No! I just come out without saying where I was going—but I don't know whether I'll get so far. So if you're passing my cottage —second past the inn—you can tell her as you've seen me." And with that he bid me good day and hoped heartily that I'd have a pleasant walk. "No, no, I didn't tell her," he said with another wink. And neither did I—the gay old dog.

I hope he lives to be 99. I hope he got there and had a good time and reached home safely. I hope Joan did not rate her Darby too soundly. I hope I shall see him again, and I hope that when I'm as old as 79 I shall be young enough to wink and chuckle and to go out on the razzle like the youthful oldest inhabitant.

PERCY FLAGE.

The Psalm of Strife.

Tell me not of calls misrouted,
I will tell you what I mean
When a sub in haste dials Finchley
Gets his wife at Palmers Green.

Thornton Heath comes through in earnest,
C.C.I. is now their goal.
If the markers are all glowing
Then they borrow over Toll.

Not enjoyment and not sorrow
Is our destined end or way,
If a call you want to-morrow
Start to dial that call to-day.

When they start the Tandem battle,
Keying out the nine for fife,
Do not let them charge you extra,
Dial the super for dear life.

Lives of auto men remind us,
We can make our calls sublime,
If we use the dial correctly,
And we listen every time.

Life is real, life is earnest,
And whatever be your fate,
If you try to dial Holborn,
Learn to labour and to wait.

When you muddle with the auto
Do not break the dial and cuss
But go nimbly on life's highway—
Try to get there on a bus.

Let us then be up and dialling
Or the calls will be too late.
Still achieving, still pursuing,
Auto now will be our fate.

M. PILOT, N.D.

Our Portrait Gallery.

NO. 1.—JEAN MARGARET MCMILLAN.

It is fitting—even though wholly against her inclinations—that the first picture of our new series of Telephone Women should be that of the Editress of the Telephonists' column of this Journal, one of the best-known members of the London Telephone Service.

Officially, Miss McMillan is a Higher Clerical Officer of the Statistical Section, high priestess of the mystic rites which surround the naming of exchanges—a work admirably suited to her literary gifts and aptitude for historical research. By way of light relief, she also presides over the construction of that merry maze of statistics known as the London Peg Count Summary!

Probably, however, it is as the Service playwright that the subject of our picture is most widely known. Year by year her clever and whimsically humorous topical musical plays appeal to a delighted audience, ever eager for more. "As You'd Like It, or Much Ado About Something," "Yesterday, To-day, and To-morrow," "Nothing Like the Truth," "Holborn Calling and Other Trifles," "Telephone Tangles, or Love in a Mist," provide a series of topical plays surely unique in the history of any telephone organisation,

and one of which members of the London Telephone Service are rightly proud.

As her name indicates, our playwright is a Scotswoman, sharing to the full all the high courage, romance and chivalry which have characterised the Britons of the North since the dawn of history. In every fibre of her being she is an eloquent refutation of all the libels on her countrymen ever invented by the subtly-humorous Scot for the delectation of his more gullible Southern neighbours.

An ardent lover of the beautiful in Art and Nature, Miss McMillan's literary bent perhaps finds its fullest satisfaction in poetry; and it would be difficult to find in the London Service anyone with a wider and deeper knowledge and appreciation of the master-works of this branch of literature.

But, despite her literary and artistic tastes, our subject is no recluse. Full of the joy of living, a lover of the sea, the open road, and the wide spaces of the world, she brings both to work and play an infectious gaiety all her own; but a keen sense of justice and a deeply sympathetic insight into the feelings of others keep her humour ever kindly. Ever ready to champion the cause of the under-dog, most loyal of friends and most generous of opponents, it is no wonder that the London Telephone Service loves its "pet playwright."

Spelling by Analogy.

A contemporary says:—

"Telephone users who use the instrument for the despatch of telegrams are familiar with the Post Office code of spelling, such as "A for Apple," "D for Dover," and so forth. A friend in Paris tells me that the postal authorities there have adopted a similar system, and with the growth of the use of the London-Paris lines we need to become familiar with it." He then gives the names used; but as, to quote him again, "they ring unfamiliarly in English ears," perhaps the following rhyme will help us to memorise them:—

"A" stands for Anatole (France, and no other),
"B" is for Benjamin, Joseph's young brother;
"C" for Celestin, une demoiselle pretty,
"D" for Désiré, who works in the city.
"E" is for Edouard, *he* owns a villa,
"F" is for François (complete with cedilla).
"G" stands for Gaston (Leroux, si vous voulez),
"H" is for Henri (no mot fits but "poulet").
"I," Isidore, is a name we can't love,
"J" is for Joseph, whose frère is above.
"K" stands for Kléber, a strange nomination,
"L" for Lazare (with a "Saint" he's a station).
"M" is for Marie, coquettish, I guess;
"N" stands for Nicolas—don't sound the "s."
"O" is for "Oscar (see "Dorien Gray");
"P" for Pierre (or for Peter, our way).
"R" stands for Robert, who lives near the Somme,
"S" is for Samuel, Eli's jeune homme.
"T" is for Théodor, Boulevard frequenter,
"U" for Ursule, who a convent will enter.
"V" is for Victor, un homme comme il faut,
"W," William, is English, I know.
"X" is for Xavier—he was a saint,
"Y" for Yvonne, who's attractive, though quaint.
"Z" stands for Zoe—c'est fini! Voila!
Voici ze Alphabet; n'oubliez pas.

The Death of Old Reliance.

Full many a year has passed away
And now we all are sad and sighing.
Take out the peg and the number plate,
For these are sadly out of date,
"Reliance" is a-dying.
Old friend, you must not go;
You came to us so readily,
You lived with us so steadily,
Old friend, you shall not go.

The subs are still; they do not call;
They will not flash and glow again.
They now will use the auto dial,
'Twill doubtless prove to them a trial,
They'll call for girls in vain.
Old friend, oh! do not go;
So long that you have been with us!
Such times that you have seen with us!
Old friend, you shall not go.

He was full of irate subs.
But all their swearing now is o'er.
To make him die the engineers
Did speed away with all their gears.
And now he is no more.
No good to sigh and moan;
C.B. is old and stale, my friend;
And Auto, new and hale, my friend,
Claims "RL" as its own.

I. E. R. J., Rodney.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LONDON ENGINEERING DISTRICT NOTES.

Retirements.

MANY changes are taking place in the personnel of the London Engineering District and others are pending. In addition to those referred to in recent notes, we have to record this month the retirement under the age limit of two Executive Engineers and an Assistant Engineer. Mr. C. Appleby was in charge of the Centre External Section, Mr. R. A. Wells was in charge of the North-east Internal Section, and Mr. F. J. Phillips was Assistant Engineer in the West External Section. In each case a suitable presentation was made by their colleagues and wishes were expressed for a happy period of retirement. As each of the officers is retiring in sound physical health and full mental vigour there is every reason to believe that the sincere wishes of their friends will be realised.

If the suggested history of the Engineering Department is written it will be found that the years served by these gentlemen were amongst the most eventful in that history. When the mantle of the prophet is donned it is often found to be a misfit, yet it is difficult to refrain from prophesying that the next 40 years will not unfold greater changes than it has been the lot of the above-mentioned officers to see in the 40 years just passed. Of course, 40 years is a long time and the applications of science to all forms of industry are advancing rapidly. Moreover, there is always the possibility of a discovery which is so entirely new that it cannot be regarded as a development but as epoch making. Nevertheless, when it is remembered that at the time of the entry into the service of our colleagues who have just retired, the telephone was still in its infancy and that they saw the introduction of paper core cables, loading coils, thermionic valve repeaters, common battery and automatic telephones, and that sandwiched in these years was the great world war and all the problems of communications which it produced, it will be granted that the coming years will have to produce many very drastic changes if they are to equal in variety the 40 years just passed. To those who, to a large extent, have been contemporary with the men recently retired it is rather a sad thing to see the departure of one after another of those who have so cheerfully borne the burden of the strenuous years and have triumphed over each new difficulty. But this sadness is mitigated when consideration is given to the splendid traditions of loyal devotion to duty which they have helped to build up and to the evident appreciation of these traditions by the younger members of the staff. While this spirit remains there need be no fear that the Engineering Department of the Post Office will suffer in comparison with any other public or private concern in this or any other country.

Underground Operations.

From time to time traffic jams are caused by street operations and a long-suffering public expresses in unmeasured terms its opinion of those responsible for causing the obstructions. Very few, however, know of the extensive planning that precedes these operations in order to shorten the period of interruption, nor of the extensive work that may be going on underneath the undisturbed portion of the carriageway over which they are riding. An operation has recently been carried out in the vicinity of Whitehall of which the only evidence to the passer-by was a pile of earth, bricks and ironwork surrounded by trestles at the side of the road! A site for a new exchange to accommodate 20,000 lines was required in this area, and the only available site was in a court which is approached by a narrow passage. The whole space underneath this passage was occupied by cellars, and although it may have been possible to lay a few pipes, the room available was altogether inadequate for the hundred ducts that were required. Adjoining the site was a large block of Government offices. No building is sacrosanct to a telephone construction engineer. Permission was therefore sought to tunnel under the foundations of this building. Surprise was expressed, but ultimately consent was given. The manhole in the adjoining thoroughfare had to be of great depth in order to get access to the tunnel. The thoroughfare carried a considerable amount of traffic and moreover was congested underneath the surface with pipes and sewers. The Post Office Engineers tunnelled under all these and ultimately got as far as Whitehall. At this point there was a busy omnibus halt, so the tunnel was continued across the road. Ducts were laid in the tunnel and the excess space filled in with concrete.

Trial holes had shown that the desired route from this point via Charing Cross was congested with pipes and in addition, the dislocation to traffic would probably be serious if an attempt were made to lay ducts in an open trench. Permission was therefore sought and ultimately obtained to tunnel underneath

the foundations of a large commercial building which was in course of erection and so to gain access to a back street. The only possible route for the tunnel made it necessary to pass close to some ancient buildings which had to be shored up and underpinned. Then it was found that obstructions existed in the back street which could not be tunnelled under, and from working at a depth of about 20 feet it was necessary to lay pipes just underneath the paving. This involved a change from earthenware ducts laid in a mass and surrounded with concrete to steel pipes laid in shallow formation grouted in with mortar and covered with a steel plate to prevent accidental damage. Ultimately, a nest of conduits was provided between Craigs Court, Whitehall, to The Mall, and the north side of Trafalgar Square and other points where connexion could be made to existing duct routes.

Other operations of this kind are now in progress. Before they are put in hand very careful estimates of the requirements are made so as to ensure that the same thoroughfares will not need to be disturbed again for many years, but of course there is a limit to the extent to which provision can be made for the future and estimates are liable to fail. The Post Office is only one of many undertakers using the space under the road surfaces, and those concerned in the present operations—difficult as they are—cannot avoid thinking with some pity of those who on some future occasion will have to augment these routes. Perhaps, however, the pity is wasted and before the present provision is exhausted other means of communication will have been invented which will not involve the use of wires under the streets.

Centralised Service Observation Equipment.

This equipment has been installed in the Wood Street building to accommodate the observation junctions connecting the exchanges in the London area. Each junction has access to 25 or more subscribers' lines.

The outstanding feature of this equipment is that the subscribers' call when picked up at the distant exchange is automatically routed to an idle observation operator's position.

The observer's receiver is connected to the observed subscriber's line enabling the observer to hear all audible signals and speech on the subscriber's line.

A lamp number display shows the number, digit by digit, as the observed subscriber dials (outgoing calls). The following visual and audible signals are received at the observation position :—

(1) Pilot lamp lights at commencement of call.
(2) "A" lamp lights under control of observed subscriber's switch hook.
(3) "B" lamp lights :—
  (*a*) When the observed subscriber's line is seized for an incoming call.
  (*b*) When the metering condition is applied to the observed subscriber meter.

A tone is also heard by the observer when the metering condition is applied.

When a call is connected to an observation position the observer has control of the observation connexion and has the following choices :—

(*a*) Maintain the whole of the observation connexion to enable observing of successive calls to or from the same subscriber.

(*b*) Release tapping unit only, but maintain contact with the junction which enables calls to or from observed subscribers at the same exchange to be observed, i.e., concentrating the observation of a particular exchange on to one observation position.

(*c*) Release the whole of the observation connexion thereby freeing the observation panel for further calls from any exchange.

Facilities are provided at the central point to enable calls incoming to the subscriber to be rejected from the observation equipment.

When the junction is engaged all other tapping units are locked off the junction, also if the observation connexion is released during a call the tapping unit concerned is locked off the junction for the duration of the call, and if all observation positions are engaged release conditions are set up on junctions not in use to release tapping units which may be connected by observed subscribers making or receiving calls.

The junction equipment at the central point has been designed so that observation on manual exchanges and phonogram circuits can be observed on the same observation positions which are being used for auto subscribers.

It is worthy of note that throughout this equipment all switching and connexion is performed by selectors and relays, keys are only used to give access to the various controls, no jacks and plugs are used on the observation panel.

The equipment has been designed entirely by officers of the Engineer-in-Chief's Department, and the circuits at the observed exchanges are identical for all the various contractors' exchanges.

New Automatic Exchange.

Name and Address.	*Date opened.*	*Manufacturers.*
Metropolitan, Wood Street, E.C.	Aug. 31, 1929.	Automatic Telephone Co.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of July resulted in a net gain of 4,671 stations as compared with 3,865 last year.

An agreement for service handed to a visitor at the Ideal Home Exhibition in March, 1927, was received duly completed at the Western District Contract Office on July 25, 1929. Truly a case of "Cast thy bread upon the waters and thou shalt find it after many days."

A lady writes "the extension of the telephone to my bedroom upstairs at . . . is a great comfort and I am very glad I had it done." We are glad also, and having preached the value of extensions in season and out of season it is pleasing to have our views confirmed even by one of the thousands who have had extensions installed as a result of the post card advertisement sent out with accounts.

The additional convenience afforded by extensions is often more appreciated than the easily forgotten value of the telephone service itself, and the cost of extensions is insignificant to a telephone user.

An arrangement of some interest was discovered a short time ago when it was found that a telephone subscriber who lived a short distance from a multi-coin box kiosk, which had not been fitted with an emergency press button, had adopted the ingenious idea of placing two pennies on the top of the bell box and sticking them down with a piece of adhesive tape. He explained that his idea was in case of fire he might be caught in such a position that he could not rush back into a blazing house to use his own telephone and as he was not in the habit of keeping the necessary coins in his pyjamas these pennies would be immediately available. His neighbours were all aware of this arrangement so that it would be equally helpful to them. It is not proposed to disclose the neighbourhood of the kiosk lest some thoughtless individual might show a lack of appreciation of this foresight. The gentleman who was the author of this ingenious arrangement had served in the Navy.

* * * *

L.T.S. Bowls.

The last game in the "A" section of the league was played on July 22, when the Science Museum were defeated by 65 shots to 45 shots. The club's final record in the competition now reads, played 7, won 6, lost 1; shots for, 458; shots against, 369. This result ensures the L.T.S. the championship of the section and they have qualified to meet the winners of the "B" division for the Bunbury cup.

The deciding match will take place at Chiswick in September on a date to be arranged.

In addition to the Bunbury cup final two club games are down to be played on Sept. 9 against the C.T.O. and Sept. 10 against the Engineers.

Players are requested to make a note of these dates.

It is pleasing to record that one of the club's players, Mr. Hutchinson has been invited to play for Scotland in the championship tournament at Chiswick this month.

* * * *

An L.T.S. Bowls Tragedy.

The air was still—a sudden thrill
  Ran through our little rink
As number two and number three
  Crept off to get a drink.
When number one, the son-of-a-gun,
  Bent down to do his stunt
With a startling snap from under a cap,
  Came orders—"Face your front."

Poor number one, his training done
  In days when war occurred,
Just dropped his wood and there he stood
  And waited for the word
To stand-at-ease or bend his knees.
  But ne'er a sound came back,
For it must be told he was badly sold
  By an animated "Jack."

When two and three returned from tea (?)
  The sight they saw dismaying
A wood in the ditch and one on the pitch
  Of cricketers nearby playing
Said number two, whose coat of blue
  Had badges back and front,
"Leave this to me, for I can see
  Two Jacks. I'll bear the brunt."

Alas ! alack ! his arm came back,
'Tis true he did his best,
But he forgot, when taking shot,
The gold braid on his chest.
He sank beneath that heavy sheath
Of badges round his chin :
Now R.I.P. is all we see
Of a little boy called "Jim."

Poor number three, now all at sea,
Heard skip say with a snort,
"I want one here, I want one clear,
I want one "up," one "short."
He wiped his eye, said with a sigh,
"All skips are sent to try us."
With quaking heart he made a start
And sent one up—wrong bias.

The skip stood there and tore his hair,
His jaw was quickly tight'ning.
Then with a bound he cleared the ground
His wood flashed by like light'ning,
With "country fine" he smashed the line
And took the jack careering
Just like a star into the bar
Where one, two, three were . . .

H. A.

[The bard seems to suggest that the three were tea-tasting again.]

* * * *

Cricket : London Telephone Service.

One of the most interesting matches of the year is the annual fixture between the Cricket Champions and the rest of the league.

The event is somewhat in the nature of an anti-climax after the keenness displayed in the competition games, and the latest fixture provided perhaps the most interesting and enjoyable game of the whole series.

The champions have been considerably strengthened this season by the addition of several promising young players, and they seem to have hit upon the happy combination of youth and experience which generally succeeds more frequently in cricket than in other games.

Batting first, "The Rest" were in danger of being overwhelmed by the excellent bowling of Shepherd and Merrick, but a timely stand midway through the innings and a healthy and vigorous knock of 46 by White, a young and improving youth from the Messengers' team, altered the outlook, and with the tail wagging a respectable total of 139 runs was reached. The champions opened quietly with Beaumont and Webb, but very soon the "Captain" found one or two opportunities of exploiting his favourite sweep to leg and quickly scored 20 runs when he was bowled by Moon.

Adams 23 and Merrick 26 not out were the other chief scorers, the innings closing for 95 runs.

Pearkes bowled very effectively and his final analysis of 8 wickets for 47 runs was his best performance of the season.

Scores :—

The Rest.		*Champions (Traffic Branch).*	
F. Pearkes, c. Pountney, b. Shepherd	4	B. Beaumont, c. Lester, b. Pearkes	4
G. Moon, b. Merrick	8	J. Webb, b. Moon	20
F. Young, c. Shepherd, b. Merrick	8	F. Thomson, lbw., b. Moon ...	0
R. White, c. Merrick, b. Adams	46	J. Shepherd, b. Pearkes ...	5
F. Moyle, c. North, b. Merrick	9	H. Adams, c. White, b. Pearkes	23
L. Murfit, c. Thomson, b. Shepherd	0	H. Pountney, b. Pearkes ...	0
J. Dickinson, l.b.w., b. Shepherd	9	F. Bishop, b. Pearkes ...	0
H. Lester, c. & b. Merrick ...	25	L. Walby, c. Murfit, b. Pearkes	9
G. Lewis, not out	9	E. Sweetingham, b. Pearkes ...	4
C. Drabwell, c. Sweetingham, b. Shepherd	7	H. Merrick, not out	26
—. Loban, c. & b. Shepherd ...	3	J. North, c. Murfit, b. Pearkes	0
Extras ...	11	Extras ...	4
	139		95

This is the "League's" third year, and the Cricket Shield kindly given by the Controlling Officers for competition has been won in turn by the three founders of the tournament, i.e., the Accounts Branch, the Contract Branch, and now the Traffic Branch. The Messengers, who only joined the league this season, have so far found the opposition too strong for them, but they will certainly do better, and have added to the interest of L.T.S. cricket by the enthusiasm they have displayed in the face of continued defeats.

Looking ahead, it would appear that future prospects are particularly bright. Many young and hopeful players are entering the various branches of the service and there is promise of a further addition to the league next year by the introduction of a team of Night Telephonists.

A tribute is due to the various "Heads of Departments" who have been agreeably helpful in promoting the various cricket events of the season.

Soon, perhaps next year, it should be possible to field a cricket eleven able to hold its own against the selected of any other Service Department.

L.T.S. Sports Association : Tennis.

The competition for the "Pink" Cup is now reaching its final stages. The semi-finalists are Miss Parker, of Maryland, and Miss Palmer, of Enfield. Miss Wilson, of A.R.1 Accounts Branch, has beaten Miss Fagan of R1, and is now waiting to meet the winner of the other semi-final in the final, which will take place at York Gate, Regent's Park Hard Courts, on Saturday Sept. 7, at 3 o'clock.

The "Agnes Cox" Cup Tournament is also approaching completion. The semi-finalists are Clerkenwell *v.* R1 (Accounts Branch) and AR4 (Accounts Branch) *v.* Central.

The final in this competition will also be held at Regent's Park, the date being Oct. 5, at 2 p.m.

The presentation of the Cups, as well as the Association prizes, Cricket Shield, and Bowls trophies will be deferred until a Social and Dance is arranged by the Committee, the provisional date for which is Wednesday, Oct. 16, at Cornwall House. Full details will be issued as soon as the final arrangements have been made.

* * * *

Table Tennis.

It is proposed to run another competition, similar to last year's, when over 90 entries were received, during the coming winter. Particulars will be circularised to all exchanges and office sections in due course. Separate competitions will be arranged for ladies and gentlemen. The Secretary, Mr. Hough, of the Accounts Branch (A.B.), hopes to receive an even larger number of entries than last year. The entrance fee, as heretofore, will be 6*d*.

MANCHESTER NOTES.

A PARTY representing all branches of the Telephone Service at Manchester spent Bank Holiday in a novel and enjoyable way. We sailed the 35 miles of the Manchester Ship Canal (by kind permission of the Manchester Ship Canal Company) from Trafford Docks to Eastham, crossed by Ferry to Liverpool and returned to Manchester by train.

Under the leadership of the District Manager (Mr. J. T. Whitelaw), the party embarked at 9 o'clock on the 500-h.p. Steam Tug *Ralph Brocklebank*. On working days this is one of the eighteen tugs which help great liners up and down the Canal, and in spite of its diminutive size (by comparison with the big ships which we passed) it had seen War service in the unpleasant capacity of "bait" on submarine chasing expeditions.

As we sailed down the Canal we saw ships from all corners of the world, some of them bringing 8,000 tons of cargo to Manchester. We passed Barton Aqueduct where the Bridgewater Canal passes over the Ship Canal and a slice of it swings round like a bridge to let ships pass. Throughout the length of the Canal there was hardly a moment when some new item of interest did not present itself. The Canal Company had also placed at our disposal pamphlets giving the history of the Canal since its opening in 1894.

It had been expected that some members of the party would rise to the occasion and turn out in white ducks and yachting caps, but in this we were disappointed. We boasted only one Sou'wester. No high seas were encountered. The ship was not guilty of a single roll, and our only experience of "that sinking feeling" was of the very mildest variety, as we sank slowly in the emptying locks.

There was some dancing on the lower deck, but the style of the dancers was cramped by the number of nautical fittings of which there was at least one per square yard. Vocal items were rendered by a small choir on the bridge and an air of great jollity pervaded the ship. In due course lunch was served on deck by an enthusiastic party of volunteer "Nippys."

At Eastham, where we took leave of the Ship Canal, a spirit of Bank Holiday gaiety prevailed and each ferryboat brought more and more eager trippers from Liverpool.

Unfortunately, we had not time to sample the pleasures which were attracting so many and, hardened sailors by now, we took to the water again sailing across the Mersey to Liverpool.

At the Gainsboro' Cafe the whole party had tea together, and before we left the District Manager expressed the thanks of all to the organisers of the excursion, while Miss Slater responded on their behalf.

Liverpool seemed mainly to be inhabited by Scouts of all nationalities exploring every corner of the city, and after tea we dispersed to join the exploration.

The fact that most of the party were already familiar with the work of Sir Gilbert Scott in the design of the new kiosks may have been responsible for the interest in his more imposing work which drew so many to the Liverpool Cathedral.

After a threatening sky in the morning we had so far been fortunate enough to have a fine day, but in keeping with our feelings of regret as the time for departure approached, the rain came at last.

The party re-united at Exchange station. We returned to Manchester by train, happy and proud of the wonderful feat that brought the sea to Manchester, and so brought to a close an interesting adventure and an enjoyable day.

GLASGOW TELEPHONE NOTES.

MISS A. T. MCNAIR, Assistant Supervisor, Class II, Central Exchange, was the recipient of many presents, including a solid silver tea service and a silver and pyrex casserole subscribed by her colleagues and friends throughout the Service.

On the afternoon of Aug. 8 Miss McNair (who, by the way, is about to run in double harness) entertained the Supervisors to tea.

We all join in wishing her the best of luck and all happiness in the future.

Miss E. McCormick, *Central Telephonist, left the Service on the 10th* and sailed for India on Aug. 13.

The Staff presented her with a special cabin trunk and a travelling rug.

Miss McCormick carries with her the good wishes of her colleagues for her future success.

Verbal Tennis between one of our Contract Officers and a subscriber who did not see why the Department, &c., &c. :—

"You telephone men are as much trouble to me as the Sanitary Inspectors." "Well, sir, you see we look after the ether and they look after the odour."

Extract: "I have had the Telephone over 10 years *and congratulate* you on the nice, courteous service from your local operators."

The Modern Author on the Telephone.

"In the instinctive reliance upon one's physical means of locomotion one forgets that the telephone works nearly one hundred and five million times as fast as a man can run."—(Egbert).

"A deaf person somewhat resembles a telephone, which appears to be an appliance for conveying information to everybody but the person addressed."—(Freeman).

"I should like to use the telephone, if I may! He was shown into the private office, where in response to polite and repeated requests a lady at the exchange found leisure to connect him with Shepherd's Oyster Bar. . . . "I have only just finished telephoning," he said. "The Central Exchange are like the gods. They never hurry."—(Bridges).

"The amazingly complex affair began with the ringing of the telephone bell as we sat at breakfast that gloomy, chilly, mid-November day. Telephones ring for many purposes, trivial and tragic, but this one rang up the curtain on a play that was to hold us fascinated until dull November was a thing of the past."—(Temple-Ellis).

"If there was anything he particularly hated, it was to be called away from a good breakfast by the telephone."—(Triem).

"The telephone bell trilled, and with a stifled malediction he stepped over to the instrument."—(Connington).

"She snapped the word at him as if she were hanging up a telephone receiver."—(Edholm).

"The lawyer's voice sounded a little queer over the telephone, but she blamed that to the instrument."—(Roberston).

"We've been kept awake nights with that blamed telephone bell jangling so much."—(Spears).

"Your Solicitors are on the 'phone—Messrs. Hardy, Hardy and Hardy." "What, all three of them."—(A. Non).

"Seating himself at his desk, he pored over the fine print of the little red telephone book for about ten minutes and then sat back with a satisfied expression on his face."—(Baron).

"We do not call telephones miraculous, though they would have seemed so two hundred years ago; they are not miraculous because their mechanism is understood."—(Dean Inge).

"Well I wasn't exactly fishing for your telephone number."

"Wait a minute, I want to do a little 'phoning." He shut himself in a little dressing-room and called upon the lightnings of the heavens—condensed into unromantic numbers and districts" . . . "Is that you?" said I, employing the foolish words that form the vocabulary of every talker through the telephone." . . . "Imperious What's-his-name, dead and turned to stone—No use to write or call him on the 'phone."—(O. Henry).

"He promised to put a bullet in me if I ever came near him, and —— The flesh is weak but the telephone is ever ready."—(Buckley).

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 230.)

1882, Oct. 1 ... Stamped reply postcards introduced.

Atlantic cable laid for Western Union Telegraph Company.

An iron screw-boat carrying 12 persons, driven by two Siemens dynamos of about 3 horse-power, moved at 8 miles an hour on the Thames. The electricity was furnished by 45 Sellon Volckmar accumulators.

De Jongh, of Belgium, introduced a system of duplex telegraphy in which one circuit is superimposed on a telephone loop while the other is in the loop.

Ostrogovitch patented a method of automatic Hughes working, using a keyboard perforator and hoping to attain an increased output.

Electric Lighting Act passed.

Dr. Hopkinson patented his three-wire system of distributing electrical power.

Baudot suggested the duplex balance system for equal letter multiplex telegraphy.

M. F. van Rysselberghe, of Brussels, discovered a means of utilising a circuit for simultaneous telegraphy and telephony. Circuit used between Brussels and Paris for simultaneous telegraph and telephone working.

La Cour invented a method of correcting telegraph distributors.

Patrick B. Delaney, of New York, improved on La Cour's device for synchronisation.

Ostrogovitch suggested sending a regular marking signal when traffic had ceased momentarily so that the synchronism of the distributors could be maintained. Picard adopted the method on the Marseilles-Algiers cable.

Metropolitan Postal Surveyors abolished and postal control of London and suburbs vested in the Controller of the London Postal Service.

Karl Wilhelm Siemens made Knight of the United Kingdom for services rendered in connexion with international telegraphy.

Nikola Tesla joined Edison's staff.

Bell exchanged telephonic wireless messages between the land and a boat on the river Potomac.

W. H. Preece experimented in wireless telegraphy between Southampton and Newport, Isle of Wight.

Mr. Shaw-Lefevre, M.P., appointed Deputy Postmaster-General with full powers to act during illness of Postmaster-General (Mr. Fawcett).

Stamps available for either postage or Inland Revenue, of higher value than one penny, introduced.

Postmaster-General (Mr. Fawcett) decided that rural posts should be established when revenue covered the cost—calculating eleven-twentieths instead of a halfpenny for each letter.

1883, Jan. 1 ... Rates for Colonial and Foreign Money Orders reduced to a scale ranging from 6*d.* for £2 to 2*s.* for £10.

M. de Cazenave, of Belgium, modified the Blake microphone.

Sir William Thomson (Lord Kelvin) said the system of nomenclature in electrical units and standards should be attributed to Sir C. T. Bright and Latimer Clark.

Dr. John Hopkinson proved theoretically that current alternators could be worked in parallel.

Delaney added damping-magnets to the reed used in connexion with the phonic wheel.

A. R. Bennett devised an electrostatic "call" wire telephone system.

Central Telephone Exchange established at Oxford Court, London.

A. R. Bennett and W. Langdon experimented with the object of obviating induction on telephone circuits introducing types of translators and transformers.

Play transmitted by telephone from the Comedy Theatre, London, to the Hotel Bristol, London.

Postal Stores Branch established and controllership created.

1883, June 22 S. Pitt patented a test system in connexion with multiple telephone switchboards.

C. J. Warner invented the telephone spring jack and plug.

1883, July 7 ... Dane Sinclair, of Glasgow, patented an automatic telephone system. J. L. Corbett joined him in making improvements.

Dr. Cameron proposed, in the House of Commons, that the minimum charge for Inland telegrams should be reduced to sixpence. The resolution was accepted.

1883, Aug. 1 ... Parcel Post service, organised by F. E. Baines, came into operation with rates ranging from 3*d.* for 1 lb. to 12*d.* for 7 lbs.

Cromwell Fleetwood Varley died.

Sir Charles William Siemens died.

James Wimshurst constructed an electrical machine.

A. E. Dolbear experimented in wireless telegraphy at Boston, U.S.A.

1883, Nov. 8 ... Willoughby Smith suggested an apparatus for telegraphing between moving trains without wires.

1883, Nov. 15 Edison filed a patent specification describing a discovery that when a metallic conductor was interposed in the vacuous space within the bulb of an incandescent electric lamp and externally connected to one side of the filament circuit, a portion of the current traversing the filament was diverted to the metallic conductor through the vacuous space. The effect noticed was called the "Edison effect" and may be considered as the germ of the idea of the thermionic valve.

1883, Nov. 20... F. B. O. Hawes' horizontal multiple telephone switchboard brought into use.

1883, Dec. ... Addition of 1*d.* for each parcel added to the calculation provided for in 1882, in connexion with rural posts, and ½*d.* for each parcel when a second delivery of day mails was desired.

12,500,000 Postal Orders issued, value £5,000,000.

1884, Jan. 3 ... At Mr. Fawcett's suggestion payments for Post Office Insurances and Annuities could be made through deposits in Savings Bank, and restriction as to "certain towns" abolished.

Free certificates of posting for unregistered parcels introduced.

Local Government Board asked to regulate the erection of overhead telephone wires.

1884, Feb. 19 A. A. Campbell Swinton patented a telephone transmitter, without a diaphragm, consisting of carbon pencils suspended vertically by a horizontal platinum wire, adjustment being obtained by varying the inclination of the frame.

First upright multiple telephone switchboards installed at Liverpool.

Elisha Gray introduced a harmonic multiplex telegraph which was worked between New York and Boston.

Patrick B. Delaney introduced a synchronous multiplex Morse telegraph system.

Ericsson devised a hand micro-telephone.

C. Langdon Davies invented the phonophore telegraph.

1884, June 2 ... Postal Orders issued in a longer series of values, but within same limits. Postage stamps to the value of 5*d.* could be affixed to the Order.

1884, June 24 United Telephone Company absorbed the London and Globe Telephone Company.

1884, Aug. 7 ... Postmaster-General (Henry Fawcett) announced terms under which telephone companies were empowered to provide a telephone service.

Calzecchi Onesti, of Italy, constructed a detector for use in Wireless Telegraphy.

Cable laid between the Sunk Lightship and Walton-on-Naze Post Office in connexion with saving of life at sea.

Two Atlantic cables laid for Commercial Cable Company.

International Congress of Electricians, in Paris, fixed the value of the legal ohm.

International Telegraph Conference, in connexion with the question of neutrality of cables in war time, said, "*Il est bien entendu que les stipulations de la presente Convention ne portent aucune atteinte a la liberté d'action des belligèrents.*"

Hughes devised a Magnetic Balance for testing the magnetic properties of iron and steel.

(*To be continued.*)