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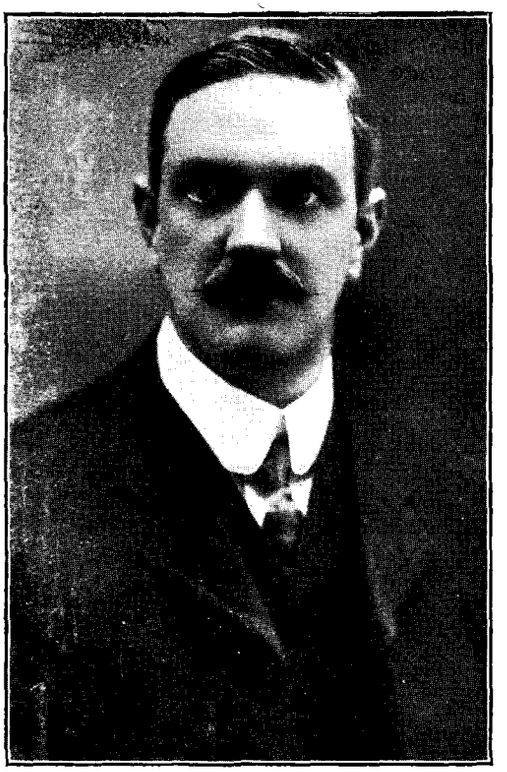
TELEPHONE MEN.

LXVIII.—WILLIAM EDWARD HART.

WILLIAM EDWARD HART was born at Leeds and educated at Leeds Grammar School. He then entered the legal profession, being articled firstly to Mr. Edward L. Hart, of Peterborough, and, on his death, to Mr. T. S. Simpson, a leading solicitor at Leeds, where he obtained general commercial and conveyancing experience.

In 1895 he became Assistant Solicitor to the Corporation of Leeds, which at that time was undertaking extensive schemes of street improvements and waterworks extensions, in connection with which he was chiefly engaged, and obtained an extensive acquaintance with arbitration procedure. He also gained much useful experience in Parliamentary work. He remained with the Leeds Corporation until 1900, and in that year he became Principal Assistant Solicitor to the Corporation of Sheffield, and shortly afterwards Deputy Town Clerk of that city. In Sheffield Mr. Hart had to take a full share of the multifarious duties of a Town Clerk's office. He took an active part in the promotion of Parliamentary bills, some of which were keenly contested. He was especially identified with the administration of the Housing Acts, upon which he has written a handbook, and took a leading part in the transfer of the duties of the School Board to the City Council when the Education Act of 1902 came into force in 1903.



Outside the work of the Council, Mr. Hart was one of the founders of the Sheffield Guild of Help. As an evidence of the esteem in which he was held in Sheffield, it may be recorded that when Mr. Hart was appointed Solicitor to the National Telephone Company in 1907, he was offered the position of Town Clerk of Sheffield.

Though a comparatively late-comer in the telephone world, Mr. Hart has identified himself thoroughly with all the interests common to telephone men, and his name and qualities, especially during the last year or two, are quite familiar to all the staff. He conducted the latter stages of the famous appeal in reference to the A to B line question, and in the complicated and protracted proceedings of the arbitration fight of last year, Mr. Hart had to grapple not only with the ordinary legal points of the case but to master the enormous mass of facts and figures with which it was involved.

He has, in many ways, shown the practical sympathy he feels for the welfare of the telephone staff. His own staff have found in him a kindly chief who sets an inspiring example of keenness in his work. A pleasant little ceremony took place at the Holborn Restaurant on Tuesday, Dec. 19, when the staff of the Solicitor's Department were his guests, and after dinner presented him with a silver table decoration in token of their regret at the parting which has since come about and of their appreciation of the pleasant relations which have obtained between them and their chief.

Mr. Hart's interest in his professional work is very great, and his capacity for continuous work at the highest pressure was very well evidenced during the first strenuous seven months of 1911. Now that the Company's active life is over he will conduct the legal portion of the arbitration proceedings and the winding up of the Company. He is about to commence private practice in London, in which his friends will wish him success. He is also Solicitor to the new Telephone Company of Constantinople.

Mr. Hart follows with great interest all that concerns his own profession, and is a member of the International Law Association.

Mr. Hart is believed to find his principal recreation in reading, and on summer evenings is to be found on the tennis lawn.

THE HISTORY OF THE NATIONAL TELEPHONE COMPANY.

THE TRIALS, TRIBULATIONS AND TRIUMPHS OF THIRTY-THREE YEARS.

By ALBERT ANNS.

(Concluded from page 191.)

PART III.

SYNOPSIS.

Mr. Hanbury's Charges—Select Committee of 1898—Telegraph Act, 1899—Municipal Licenses granted—Glasgow Competition a failure—Sale of Municipal Exchanges—London Agreement of 1901—Post Office opens Exchanges in London—Resignation of Mr. J. S. Forbes—London Wall Fire—Improvements in Switchboards—Purchase Agreement of 1905—"National Telephone Journal" started—Flat Rate abolished in Provinces—Death of Mr. W. E. L. Gaine—Managing Director appointed—Restriction of Capital Expenditure—Inventory commenced—Arbitration proceedings—Conclusion.

ON April 1, 1898, there was a debate in the House of Commons on the refusal of the Post Office to grant telephone licenses to municipalities and others, and Mr. R. W. Hanbury, the Financial Secretary to the Treasury, who represented the Postmaster-General, seized the opportunity of starting a campaign against the National Telephone Company, and by misleading and inaccurate statements seriously depreciated the market value of the Company's securities and inflicted heavy financial losses on its Shareholders. The policy of co-operation with the Company which was the essence of the arrangements made on the sale of the trunk lines in 1892 was ignored, and another Select Committee was promised. During the debate Mr. Hanbury stated that the Company's plant then existing could be entirely replaced by a capital expenditure of very little over £2,000,000. This estimate, so manifestly wrong, clearly proved that the truth about the Company's undertaking had not been sought for, as the Company had spent at the end of 1897 more than £5,000,000 on its plant, machinery and system, of which about half had been expended during the period that had elapsed since the arrangements made with the Government in 1892.

The evidence of Mr. (now Sir) William Henry Preece, C.B., F.R.S., the Engineer-in-Chief and Electrician to the General Post Office, given at the inquiry in 1895, is important in connection with the above statement. He said:

"My own impression is that they (the Company) are doing all "they can to make the service as good as it can be made. I have "had occasion to visit several of their exchanges, and I find they "compare very favourably indeed with exchanges in the "States. . . . The Telephone Company at the present moment are "entirely renovating the whole of their system, and they can "construct just as good a system, perhaps a better one. than the "county council, for the simple reason that they start with "experience that you (the London County Council) have not "got."

Mr. Hanbury's charges may be shortly summarised as follows:—

(1) That the Company was giving an inefficient service, more particularly in the Metropolis and Glasgow, and he argued that this had been proved by the report of the Commissioner with regard to the latter and by Mr. Forbes' evidence concerning the former. To have been quite fair he should also have informed the House of Commons that although the Commissioner had reported that the service in Glasgow was not efficient, he at the same time stated that the corporation was responsible for that inefficiency, and that Mr. Forbes had given evidence that so long as the London County Council refused the necessary facilities the Company's system in the Metropolis could not be made as good as it ought to be.

(2) That the Company had got the better of the Post Office by having the local areas made so large that municipal competition was seriously hampered.

This is satisfactorily answered by referring to Mr. Arnold Morley's testimony in the House of Commons on March 1, 1895, that the settlement of the areas was a matter of great difficulty and complexity, and in regard to it the Telephone Company had acted very honourably.

(3) That if competition was not established the Company after 1904 would probably raise its rates.

There was no justification for this statement as Mr. Forbes in 1895, informed the Committee that although the Company would probably have to restrict its capital expenditure after

MR. FORBES GIVING EVIDENCE BEFORE THE SELECT COMMITTEE OF 1898.
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1904, it would continue to maintain its service in the highest state of efficiency, but he made no suggestion whatever as to altering the Company's tariff.

(4) That the Company was not under strict control or stringent regulations. At this time it was quite well known that the Company had repeatedly offered to accept the control of some official authority in return for the grant of statutory powers.

(5) That the Company's alleged practice of giving free telephone service had prevented the development of the Post Office exchanges. This charge was afterwards disposed of by the evidence given before the Committee.

On May 9, 1898, the House of Commons ordered "That a "Select Committee be appointed to inquire and report whether the "telephone service is, or is calculated to become, of such general "benefit as to justify its being undertaken by municipal and other "local authorities, regard being had to local finance; and, if so, "whether such local authorities should have power to undertake such "service in the districts of other local authorities outside the area of "their own jurisdiction, but comprised wholly or partially in the same

"telephone area, and what powers, duties and obligations ought to be "conferred or imposed upon such local authorities."

The Committee, with Mr. Hanbury as chairman, commenced to take evidence on May 12, 1898, and concluded its examination of witnesses on Aug. 4, 1898. Throughout the proceedings the chairman fostered an animus against the Company, and instead of acknowledging the great benefits which it had conferred on the community, sought to prove, but without success, that the National Telephone Company had from the beginning been indifferent and inimical to the wants and interests of the public. Even the responsible officials of the Post Office, who acknowledged having carried out in an honourable manner the understanding arrived at in 1892, were surprised and hurt by objectionable questions and insinuations.

The Committee's report, which was not supported by the evidence which had been given before it was issued on Aug. 9, 1898.

It recommended that general, immediate and effective competition by either the Post Office or the local authority was necessary, and that a really efficient Post Office service afforded the best means for securing such competition.

That when in an existing area in which there is an exchange the local authority demands a competing service the Post Office ought either to start an efficient telephone system itself, or grant a license to the local authority to do so.

That with regard to areas in which there is no exchange, and districts which are not areas, some provision should be made beyond what is now offered by the National Telephone Company for giving a service when there is a reasonable local demand, and that in such cases the Post Office should either start a service of its own or should grant licenses to the local authorities to do so, subject to proper regulations.

The report concluded with the following paragraph:—

"Your Committee in thus recommending a Post Office service "assume that it will constitute a real and active competition, and "that concessions to the Company not required by the agreement "will cease. Such a competition should, in their opinion, be "carried on by a distinct and separate branch of the Department, "and in future be conducted under strictly businesslike conditions "and by a staff specially qualified for such a duty."

It may be well here to mention some of the arguments given by the witnesses against the municipal competition which Mr. Hanbury apparently hoped would reduce, if it did not destroy, the value of the Company's property.

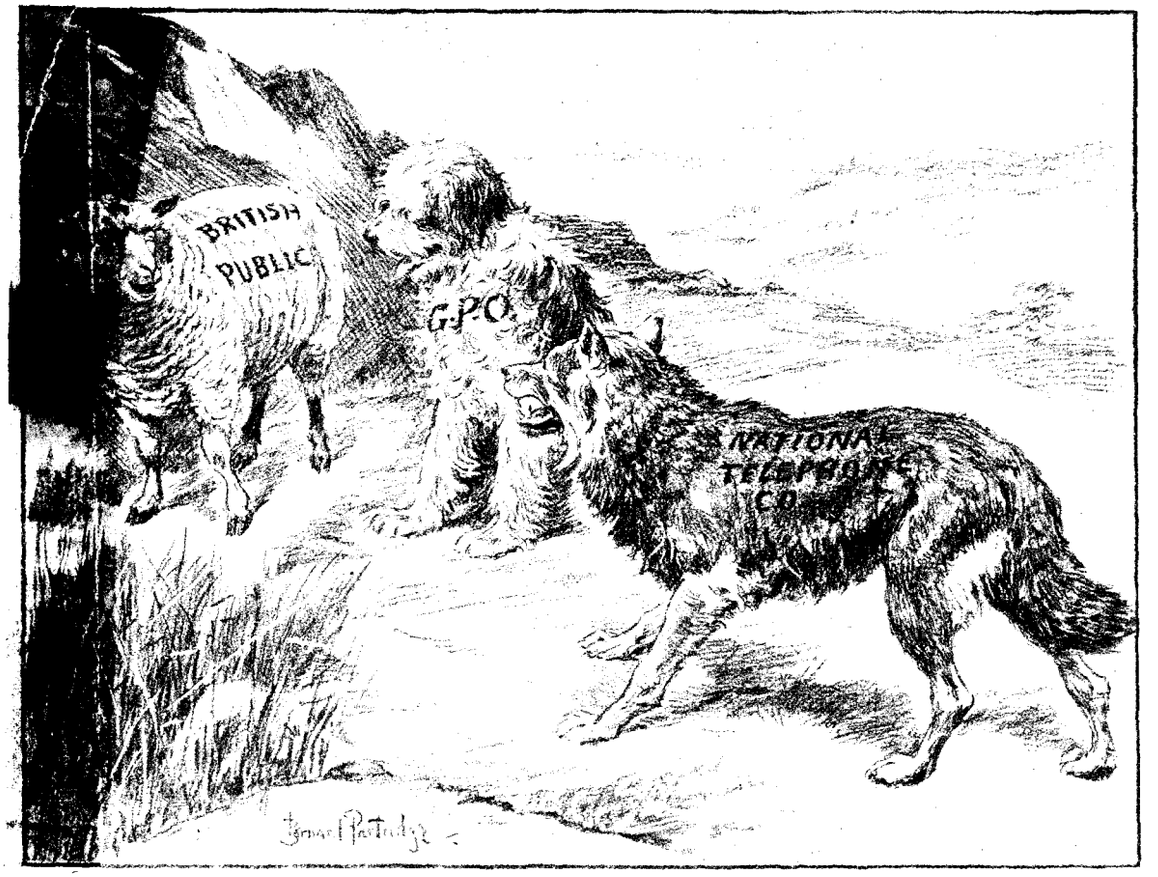
Mr. Arnold Morley, Postmaster-General 1892-5, said that he was strongly against competition unless the Post Office was forced to it in the interests of the public, and that the right to interfere and give competition should be reserved for the cases where the Company could not or would not give an effective service.

Mr. J. C. Lamb, C.B., C.M.G., the Second Secretary to the Post Office, stated that, in his opinion, great public inconvenience and confusion would arise from the establishment of rival systems, and that the Company was no longer a licensee, as provisions were made in the agreement for the co-operation, alliance and harmonious working as mentioned in the Parliamentary Debates and in the Treasury Minute, and that the agreement made to persuade the National Company to give up its trunk wires placed it in closer relation with the Department than any new comer could possibly be in.

Mr. J. S. Forbes told the Committee that he relied on the declaration of policy made in the House of Commons in March, 1892, that assurances were given him that the Postmaster-General would not grant licenses in respect of areas in which the Company was already established if it was giving a reasonably efficient service. That it was only on these declarations being confirmed by Ministers and others that there would be co-operation and not competition with the Company, that he advised his Board to make the bargain. Mr. Forbes further stated that it might not be a breach of faith to grant licenses to municipalities, but it would be evasive of the spirit of the agreement and would certainly not be consistent with the equity of the understanding reached in 1892.

Mr. G. J. Goschen, who had been the Chancellor of the Exchequer in 1892, when the preliminary arrangements for the purchase of the Company's trunk lines were made, while disagreeing with Mr. Forbes' evidence as a whole, said that he thought it would be evasive of the spirit of the agreement if, during the continuance of the license, the Government took the whole of the telephone arrangements into their hands to the detriment of those who, on the faith of the licenses, had been extending the system up to the present moment.

Mr. Forbes' evidence was confirmed by Mr. W. E. L. Gaine, the General Manager, who, in answer to questions, said that in 1892 the Company desired to have a clear explanation of what the intentions and policy of the Government were going to be. That the Company then occupied a position that was absolutely unassailable by competition in having possession of the trunk lines and the power and the right of opening exchanges anywhere in the country. That explanations were given as to what the policy of the



THE PERFIDIOUS SHEEP-DOG.

Sheep: "Here, I say, keep him off! Keep him off!"
Sheep-Dog: "'*Keep him off?*' Why, don't you know we've *just gone into partnership?*"

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"And things are not what they seem."—*Longfellow.*

TELEPHONE HOUSE, VICTORIA EMBANKMENT, LONDON.
THE HEADQUARTERS OF THE NATIONAL TELEPHONE COMPANY.

Government was intended to be, and on the faith of which the bargain was made. That assurances were given in his presence by the Postmaster-General that it was not the intention of the Government to enter into general competition with the Company, but to co-operate with it.

BROMLEY EXCHANGE.
Faced with red bricks, with dressings of brown Portland stone.

As the municipalities were unable without statutory authority to use the ratepayers' money to provide telephone services, an Act of Parliament became necessary to get over the difficulty. When the Act was first drafted it left the Company at the mercy of every local body which had by agreement sanctioned the Company placing its wires underground.

The amount of the Company's capital thus threatened was very great, and the President of the Company and other Directors very strongly urged on members of Parliament the necessity of having the matter equitably adjusted. Mr. Gaine also was unceasing in his protests against the contemplated unjust treatment of the Company, and finally clauses were inserted in the Act which gave the Company protection in those cases where municipalities afterwards started competing telephone systems.

The Act, while giving the Company security for its underground plant in those areas where it had already carried out the work, left other municipalities the right of establishing competing systems, and at the same time denying the Company wayleave facilities.

In the autumn of 1898 Mr. Gaine, accompanied by Mr. Sinclair, visited, for the first time, the United States of America, and inspected and examined there the telephonic plant and arrangements in many of the important cities and towns.

The information gained in this and subsequent visits was of great assistance in keeping the property of the National Telephone Company in the United Kingdom up to date, and Mr. Gaine very quickly assimilated any new ideas in telephonic development.

The expansion of the Company's business made it necessary to concentrate its Head Office staff which, at that time, was located in various places in the City of London, and a site being secured on the Victoria Embankment in 1899, the building, afterwards to be known as "Telephone House," was erected from the plans prepared by Mr. A. Nelson Bromley, F.R.I.B.A., who had also been responsible for many of the exchanges built by the Company in the Provinces.

In March, 1899, another Telegraph Bill was introduced by the Government, and about the same time the National Telephone Company again approached Parliament for wayleave facilities which were, for the fifth time, refused.

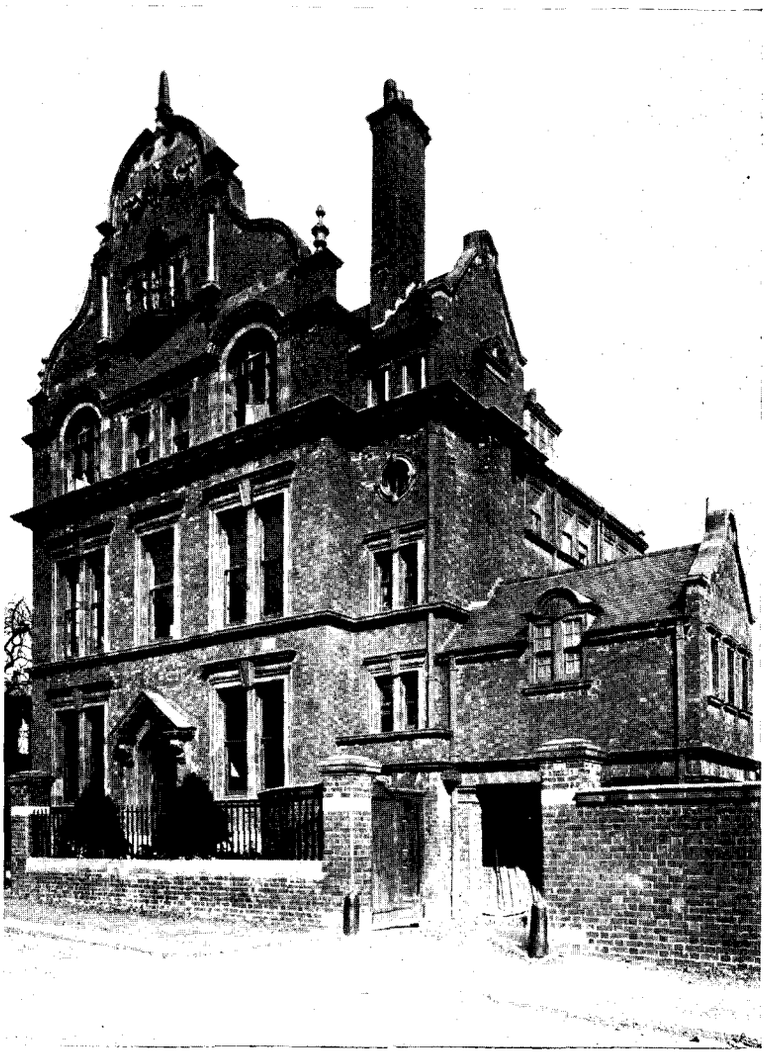
A Treasury minute was issued on May 8, 1899, upon the proposals for the development of the telephone system in the United Kingdom setting out the conditions to be attached to a license to a local authority, and further stating that all licenses would be terminable on Dec. 31, 1911.

On Aug. 9, 1899, an Act to make further provision for the improvement of telephonic communication and otherwise with respect to telegraphs was passed.

Under Clause 3 of that Act it provided that where it was proposed to grant a competing license to a local authority, and the National Telephone Company agreed to certain conditions, the powers granted by the municipality to the National Company under which it had expended capital on underground works should continue for the period specified in the new license.

That where a local authority provided a system of public telephonic communication in competition with the National Telephone Company, and the Company agreed to conditions laid down, the Company's license would be extended for the period specified in the new license.

That in those cases where the Company's license was extended for not less than eight years intercommunication was to be given between the two systems.



ALTRINCHAM EXCHANGE.
Faced with red bricks with Derbyshire stone dressings.

On Sept. 26, 1899, Telegraph Regulations were issued setting out in detail the arrangements under which intercommunication was to be given, viz.:

When in any area the subscribers to the new licensee equal one-fourth of those of the Company in the same area, or number 500, mutual intercommunication is to be established.

Where the Company's exchange area exceeds in extent the area of the new license, then when the subscribers of the

new licensee in the smaller area equal one-fourth of the subscribers in the larger exchange area of the National Company, mutual intercommunication is to be provided.

Terminal charges as between both systems were fixed in some cases at 1*d.* and in others at 1½*d.* per call, but were to cease entirely when the subscribers of the new licensee equalled one-half of the Company's subscribers for the time being in the area specified in the new license, or in the whole exchange area of the Company, as the case might be.

In 1901 common battery equipments to replace the magneto exchanges were installed at Hull, Sunderland and Kensington.

In 1903 estimates were prepared for the replacement of most of the larger magneto exchanges in London by common battery equipments. The first exchange dealt with under the scheme was Holborn, where a new board of that type was brought into use in 1904.

The Company has since erected in London and in the Provinces 40 common battery exchanges of the pattern known as the No. 1 type, ten of the No. 9 type and eleven of the No. 10 type.

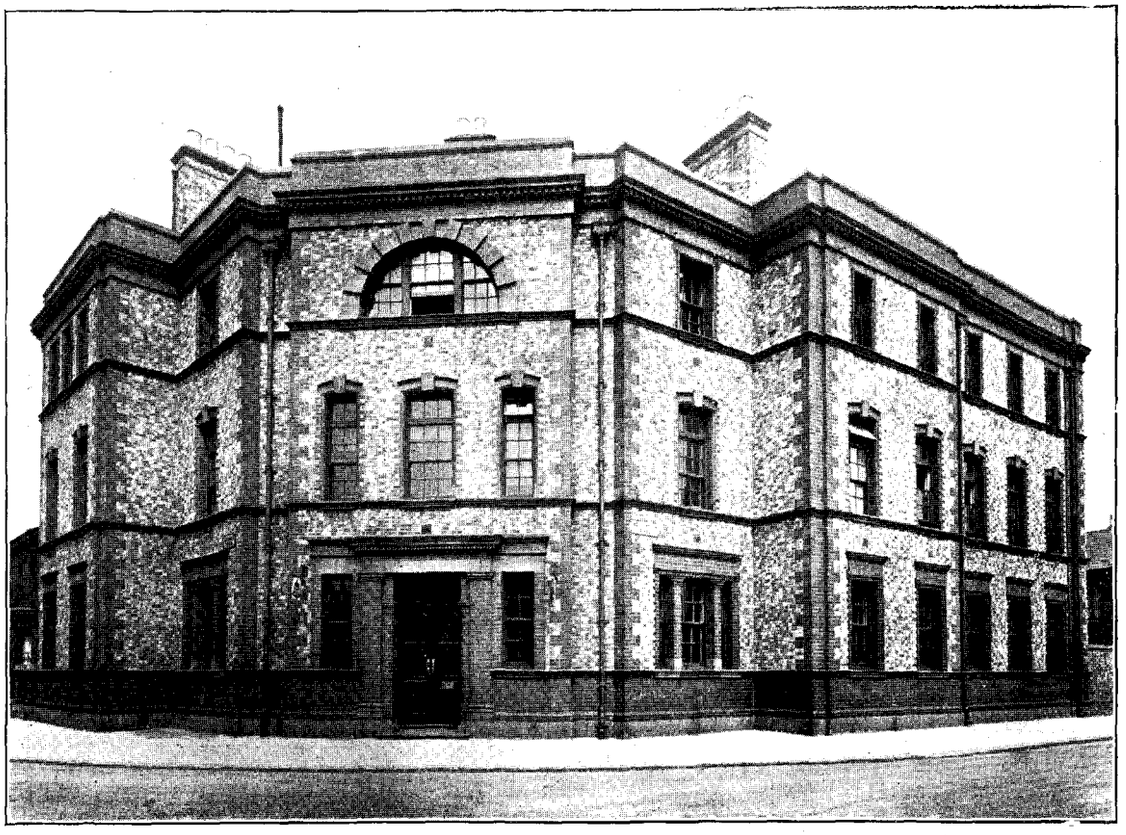
All the No. 1 type equipments constructed prior to 1906 were very similar to that fitted at Bristol, with the exception that the jacks were mounted at ⅜-inch centres, and in most cases the subscribers' lines were multipled every six panels over the "B" sections and every nine panels over the "A" sections. From 1906 onwards the boards have been of the type illustrated in the photograph of City Exchange, Manchester, the chief difference between these and those of the earlier type being the provision of fireproof bulkheads, arranged so as to prevent the spread of fire within the sections.

The No. 9 and No. 10 types of the switchboards have been designed for use in the smaller exchanges, the former having a capacity for 800 lines and the latter for 1,600. In both cases practically all the apparatus for both line and cord circuits is mounted in the section itself, which effects considerable saving in floor space.

MANCHESTER "CITY" EXCHANGE.

Built of brick with base of granite and faced with red bricks and blue brick bands with terra-cotta dressings.

Lord Stanley, the Postmaster-General, stated in the House of Commons on Aug. 8, 1905, that out of 1,334 local authorities, 59 had enquired about the terms of municipal telephone licenses; that thirteen had accepted such licenses and six installed telephone exchange systems.



LIVERPOOL "WAVERTREE" EXCHANGE.

Faced with red Ruabon bricks, with dressings of moulded red bricks and Woolton tone.

To the six municipalities which started competition with the Company the Postmaster-General granted licenses as under:—

Glasgow ... March 6, 1900 expiring Dec. 31, 1913.
Tunbridge Wells May 30, 1900, expiring April 30, 1925.
Brighton ... May 30, 1901, expiring April 30, 1926.
Portsmouth ... Sept. 21, 1901, expiring June 30, 1926.
Hull ... ... Aug. 8, 1902, expiring Dec. 31, 1911.
Swansea .. Sept. 27, 1902, expiring Dec. 31, 1920.

The Glasgow Corporation opened its first telephone exchange on April 2, 1901, and the National Telephone Company to meet the competition at once formulated various tariffs on the measured rate principle for its exchange service in that town. The fight proved to be a long and strenuous one, but, owing to the masterly way in which the operations were conducted by Mr. Gaine, the General Manager, and the splendid manner in which he was supported by Mr.

THE RT HON. LORD HARRIS, G.C.S.I., G.C.I.E.

F. Douglas Watson, the Superintendent for Scotland, and Mr. W. A. Valentine, the Glasgow District Manager, the corporation was in the end completely beaten and discomfited.

Mention must also be made of the valuable assistance rendered to the Company by Mr. Wm. Alex. Smith, a member of the Board, by Mr. D. Johnstone Smith, the Local Director at Glasgow, and Mr. H. Laws Webb who organised the Contract Department.

At the Select Committee of 1905 the Company's tactics, which had been so successful were called in question and Mr. Gaine drew attention to the fact that the Government having decided on real and effective competition, the Company had accepted the challenge, and as one could not engage in a fight with the gloves on, the Company had taken them off accordingly.

In March, 1905, Lord Stanley, the Postmaster-General, intimated to the Glasgow Corporation that it would be in the interests of both parties if some arrangement could be devised to avoid the great duplication of plant which was taking place in Glasgow. The self-esteem of the worthy citizens who had burnt their fingers over the telephone business would not permit them to accept the offer made by the Company which would have enabled the corporation to dispose of the municipal plant without loss to the ratepayers, but preferred to accept the lower offer made by the Postmaster-General in July, 1906, and closed its venture with a deficiency of about £15,000.

The price given by the Government was £305,000, or nearly £24 per station, and the Post Office had immediately afterwards to reconstruct the Glasgow Municipal exchanges, and to replace the subscribers' instruments, which involved a very heavy capital expenditure.

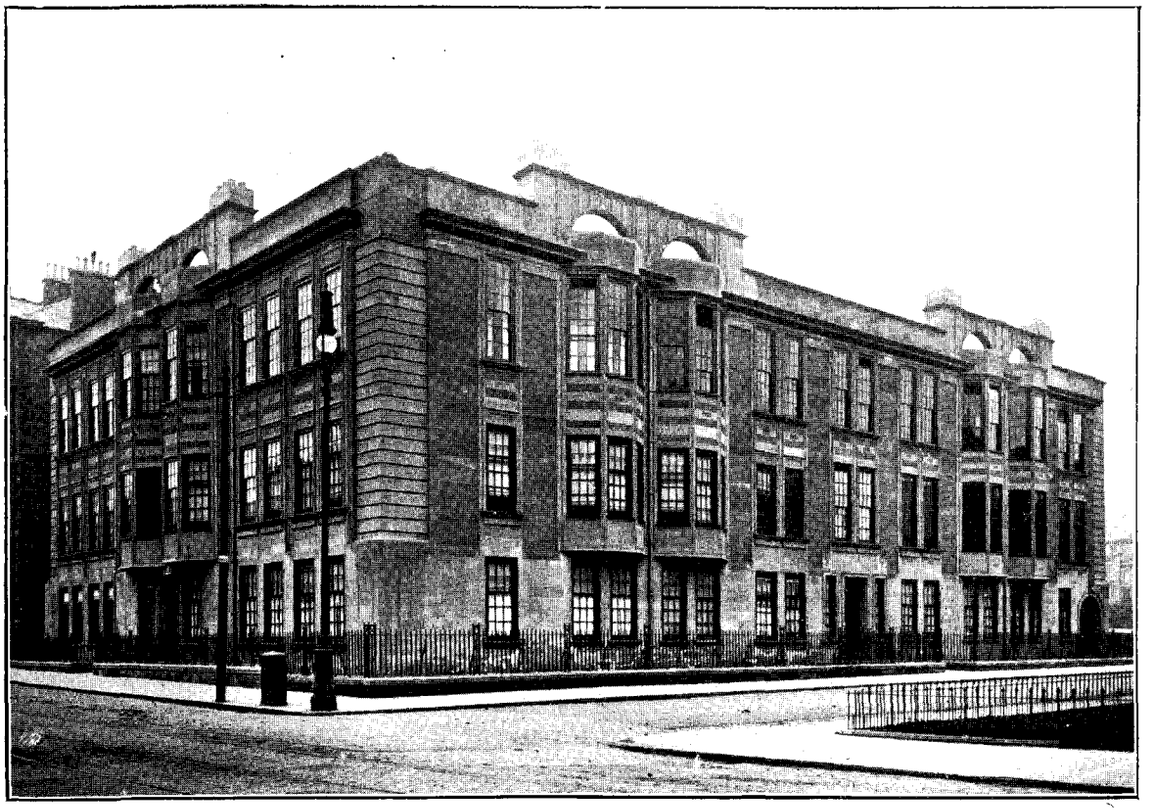
Statements were afterwards made to the effect that the corporation could not obtain up-to-date switchboards because of the patents which were controlled by the National Telephone Company. This was not correct, but the real reason why the Glasgow Corporation had to adopt an antiquated method of telephone construction was in order to keep within the low estimates that had been made for installing the system.

The Tunbridge Wells municipal system was opened in July, 1901, and the corporation was glad in November, 1902, to accept the National Telephone Company's offer to take over its debt in connection with the telephone business which it had established.

The switchboard and a great part of the outside plant were so much below the standard of the National Company's work that, very soon after the transfer, they found their way to the scrap heap.

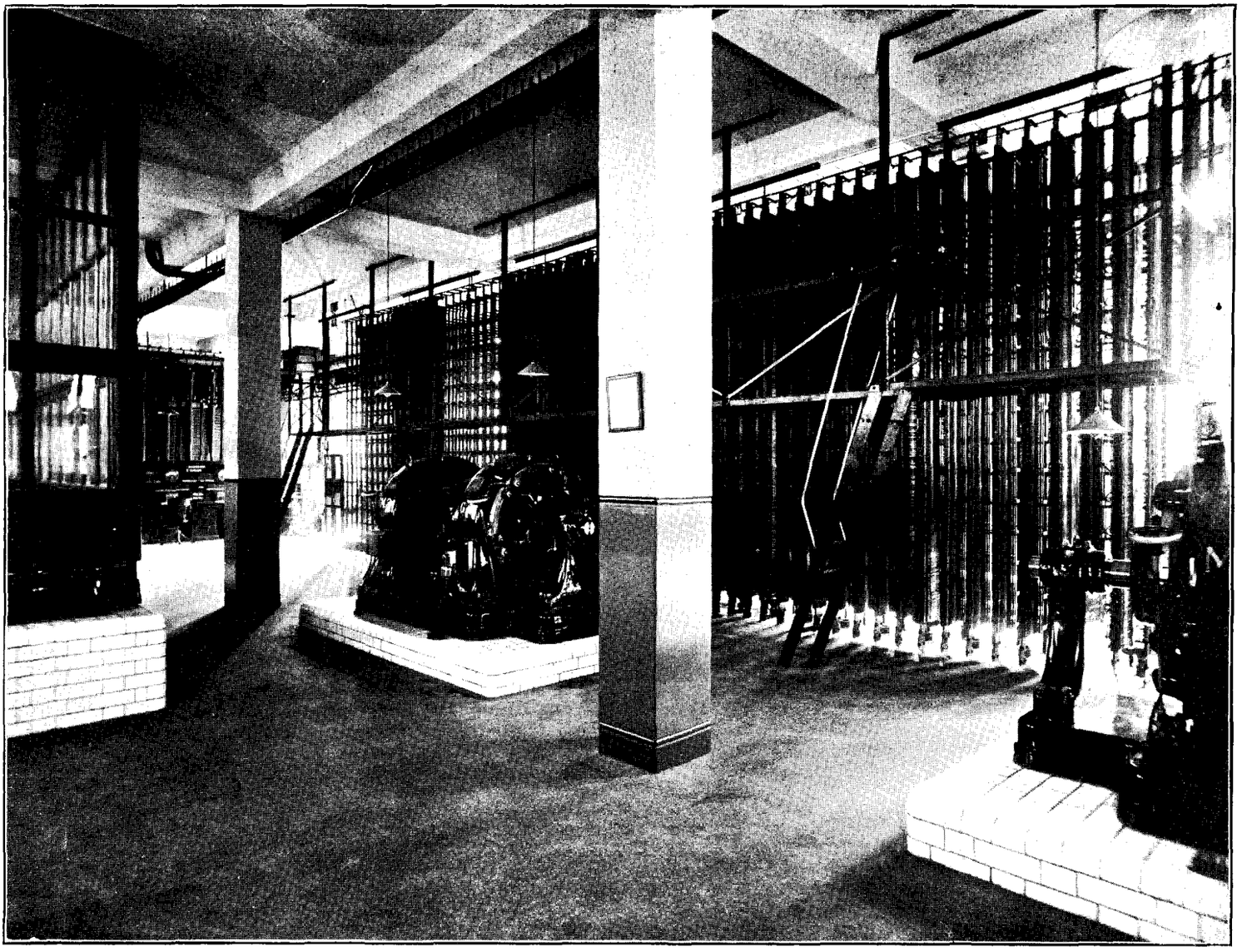
This short struggle with the corporation and its satisfactory issue were due in a great measure to the ability with which Mr. C. J. Phillips, the Provincial Superintendent, and his efficient local staff, dealt with the rival system, and it was Mr. Phillips' lot to have also to meet the competition which was set up soon afterwards by the Corporations of Brighton and Portsmouth.

The Swansea Corporation inaugurated its telephone system by opening an exchange in September, 1903, and in 1906 the Postmaster-General made an offer to purchase the municipal installation, which, if it had been accepted, would have left the



HILLHEAD EXCHANGE, GLASGOW.

Plinth and first story, white freestone. Remainder red freestone with white freestone dressings.



APPARATUS ROOM—CITY EXCHANGE, MANCHESTER, 1910.

Corporation with a loss of nearly £8,000 on a capital expenditure of about £29,000.

The National Telephone Company in 1907 reimbursed the Swansea Corporation the amount of its telephone expenditure, and so removed the competition in that area.

In Brighton the municipal telephone system was started in October, 1903, and three years later the corporation escaped from its responsibilities for the telephone service by accepting the Postmaster-General's offer to purchase its plant, property and assets for £49,000, which was equivalent to over £26 per station.

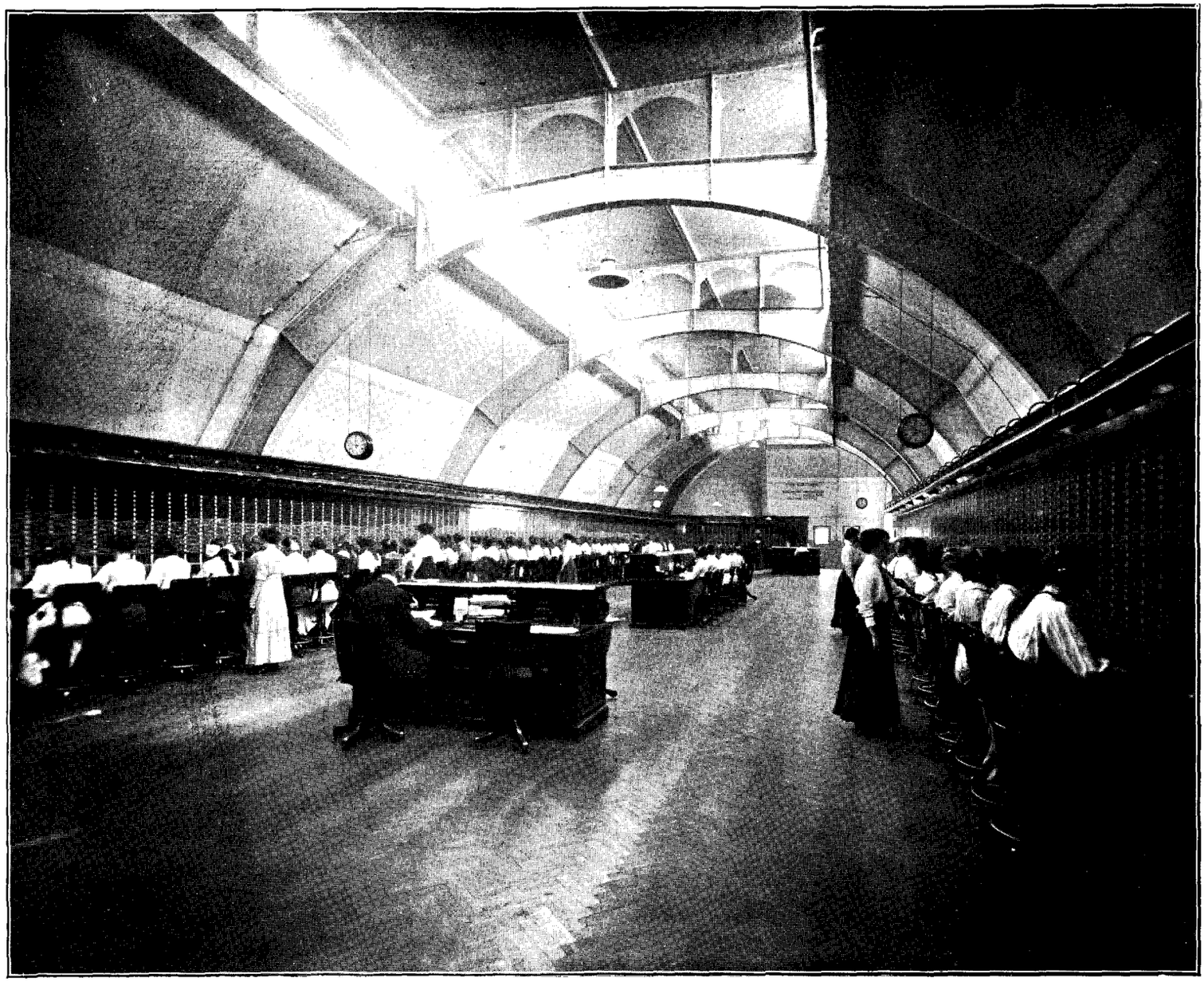
The Hull and Portsmouth Corporations have up to the present refused to accept the offers which have been made by the Postmaster-General for their respective telephonic installations, and it remains to be seen what losses will be incurred by the ratepayers of those municipalities when the day of reckoning arrives.

It is a curious feature of the competition in Hull that free intercommunication exists between the two systems by which the municipal subscribers have access without payment to the much larger number of subscribers on the National exchanges. The Company, under a wayleave agreement with the corporation dated March 18, 1899, had spent a considerable sum of money in underground work in that city, and the municipality, to prevent the Company obtaining protection for that part of its plant under the Act of 1899, gave notice to determine the agreement before the Act came into force, and it was only after some litigation that the corporation agreed to cancel the notice on the Company consenting to the free intercommunication. If the Hull Corporation can claim any success for its local system it has mainly arisen through the great benefits it has thus obtained by the aid, and at the cost of, the National Company.

It has been claimed by some of those responsible for the Hull municipal telephones that they were promised if they took a license only to the end of 1911, and so prevented the National Telephone Company from obtaining under the Act of 1899 an extension of its license in that town, to which it would have been entitled, the corporation might expect in due course to have its license extended beyond Dec. 31, 1911, the date fixed in the local license.

The Electrophone Company was started in 1894 with the object of making arrangements with theatres, churches and other places to afford telephone exchange subscribers the opportunity of having transmitted to their houses musical performances, sermons, public speeches, etc. The hearing has lately been much improved by the introduction of standardised transmission, and the service is now very efficient and much appreciated.

Since the extinction of the Mutual Telephone Company's business in Manchester several other attempts have been made to re-start competition there, but without success, largely owing to the efforts of Mr. Charles Swain Agnew, a member of the Board and a well-known merchant in that important city.



SWITCH ROOM—CITY EXCHANGE, MANCHESTER, 1910.

The Telegraph Act of 1899 provided the Post Office with £2,000,000 for the establishment of telephone systems in London and elsewhere, but it did not give the Company any extension of its license, which under certain conditions it could have claimed had the competing system been established by a municipality. But when the Post Office began to canvass for subscribers to its proposed Metropolitan system, it discovered that without intercommunication with the National Company's subscribers, the Department had little chance of success.

The Post Office, therefore, commenced to harass and impede the operations of the Company, and served it with official notice that it did not intend to grant the Company any more wayleaves on the railways and canals over which the Postmaster-General had exclusive rights in any of the places where he contemplated the establishment of competing systems, although such wayleaves were promised to the Company when its trunk lines were wrested from it in 1892.

The Government proved to be too powerful for the Company to fight, and in 1901 an arrangement was concluded under which the Company agreed to give the intending subscribers to the Post Office Metropolitan telephone system free intercommunication with its own subscribers. The agreement was signed on Nov. 18, 1901.

It provided, amongst other things—

(1) That the Postmaster-General would provide underground plant for the Company on rental terms.

(2) That the Postmaster-General would purchase such of the Company's plant in the Metropolitan area at the end of the license as would then be suitable for the Post Office telephone service.

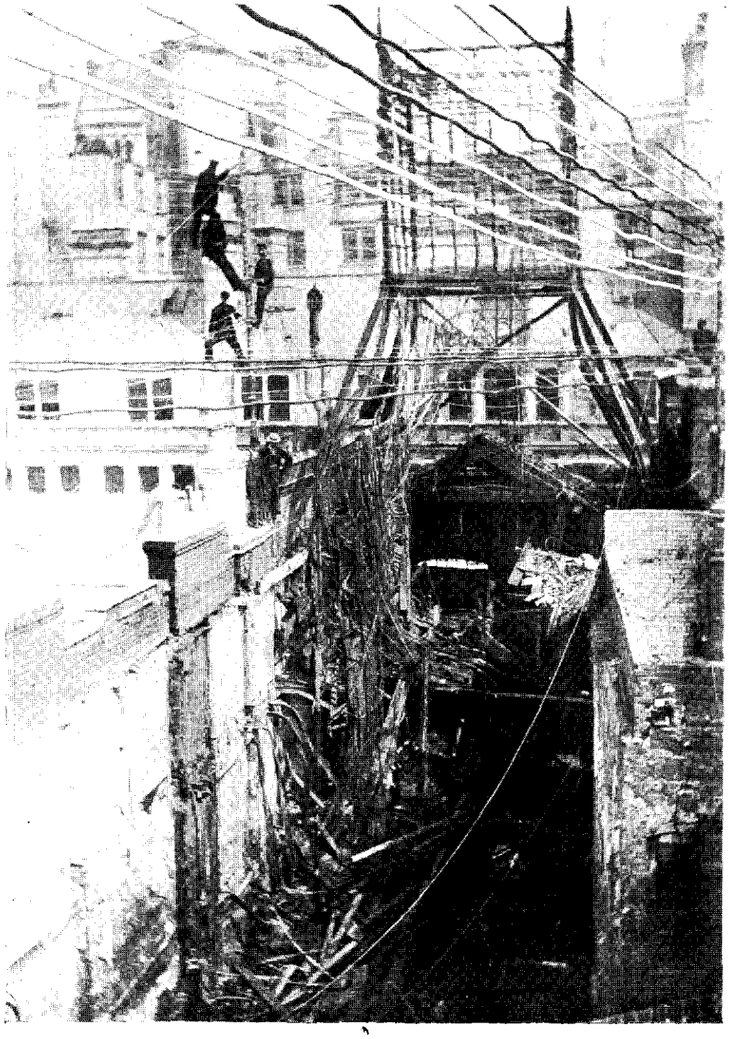
(3) It fixed an inclusive rate for subscribers within two miles of an exchange at £17 per annum for the first connection and £14 per annum for additional lines, and it also established a measured rate service, including party lines, for the smaller users.

The Post Office started its Metropolitan telephone system in March, 1902, and was fortunate in inducing the National Company to part with Mr. Geo. F. Preston, one of its Provincial Superintendents, who became the General Manager of the Post Office London telephone service.

The folly of spending millions of money in a cut-throat competition forced on the consideration of limiting the efforts of each party to certain localities in the Metropolitan area, with the result that real competition ceased except in the central portion of London, the remainder being allocated for future development into spheres of influence, the National Telephone Company accepting the responsibility in some and the Post Office in the others.

On the completion of the London agreement, Mr. J. S. Forbes in October, 1901, resigned his position as a Director and President of the National Telephone Company after nearly 25 years' association with the telephone companies, during the whole of which he had taken a leading part in shaping the destiny of the undertaking.

During his long and active career he had given evidence before several Parliamentary Committees, had negotiated innumerable agreements, and in later years, in conjunction with Mr. Gaine, had successfully met the incessant attacks made on the Company by Parliament and by municipal and local bodies.



THE RESULT OF THE FIRE AT LONDON WALL EXCHANGE.

His remarkable gifts enabled him to steer the Company safely through very troublesome times, and with a foresight which amounted to genius he avoided the many rocks and dangers which, from time to time, threatened to imperil the Company's career.

He was succeeded in the presidency by Sir Henry Fowler, who had been elected the Vice-President of the Company in the previous May following the resignation of Lord Harris who, up to then, had held that position. The vacancy caused by the election of Sir Henry Fowler as President was filled by the appointment of Mr. George Franklin as Vice-President.

In July, 1902, Mr. Dane Sinclair, the Engineer-in-Chief, resigned that position to take up the important duties of General Manager of the British Insulated and Helsby Cables Company. Mr. Sinclair had rendered the Company yeomen service for many long and arduous years, and the severance of his connection with the telephone undertaking was much regretted. His loyalty, unselfish devotion to duty, and adherence to sound business principles, had contributed in no small degree to the great success of the National Company, and his ideal at all times was efficiency and economy. The Directors were happy and fortunate in choosing as his successor Mr. Frank Gill, the Superintendent for Ireland, and future events most completely justified the new appointment.

On the evening of July 9, 1902, a disastrous fire occurred at the Company's telephone exchange at London Wall. The fire started at eight o'clock and by 10.30 the place was gutted. The adjoining offices occupied by the Engineering and Instrument Departments were vacated, and switchboards and other material, which are always held in reserve for such emergencies, were ordered by telephone from the Nottingham Factory and put on rail in trucks attached to passenger trains. The apparatus was delivered at London Wall early on the next day, other premises being secured for the staff displaced. Men were collected from London and other parts of the country and divided into day and night gangs, the work of fitting up the temporary boards and joining up the outside work proceeding continuously, with the result that a large number of subscribers were connected each day, and the whole of them, some 2,600 in number, were working again within sixteen days from the time of the fire. One hundred new outside cables had to be erected with three double and six single poles to carry the cables, and in two cases piers had to be built and girders put in to support the poles. More than 420 miles of outside wire and 334 miles of inside wire had to be run. The new exchange, although in a sense a temporary one, gave a thoroughly efficient and good service.

The remarks made by the President, Sir Henry Fowler, at the meeting of Shareholders held on July 31, 1902, with regard to this great achievement by the staff of the Company were a fine tribute to the energy and capacity of Mr. C. B. Clay, the Metropolitan Superintendent, and the able army of workers which he controlled.

The insurance companies paid £32,389 in respect of the damage caused to the buildings and contents.

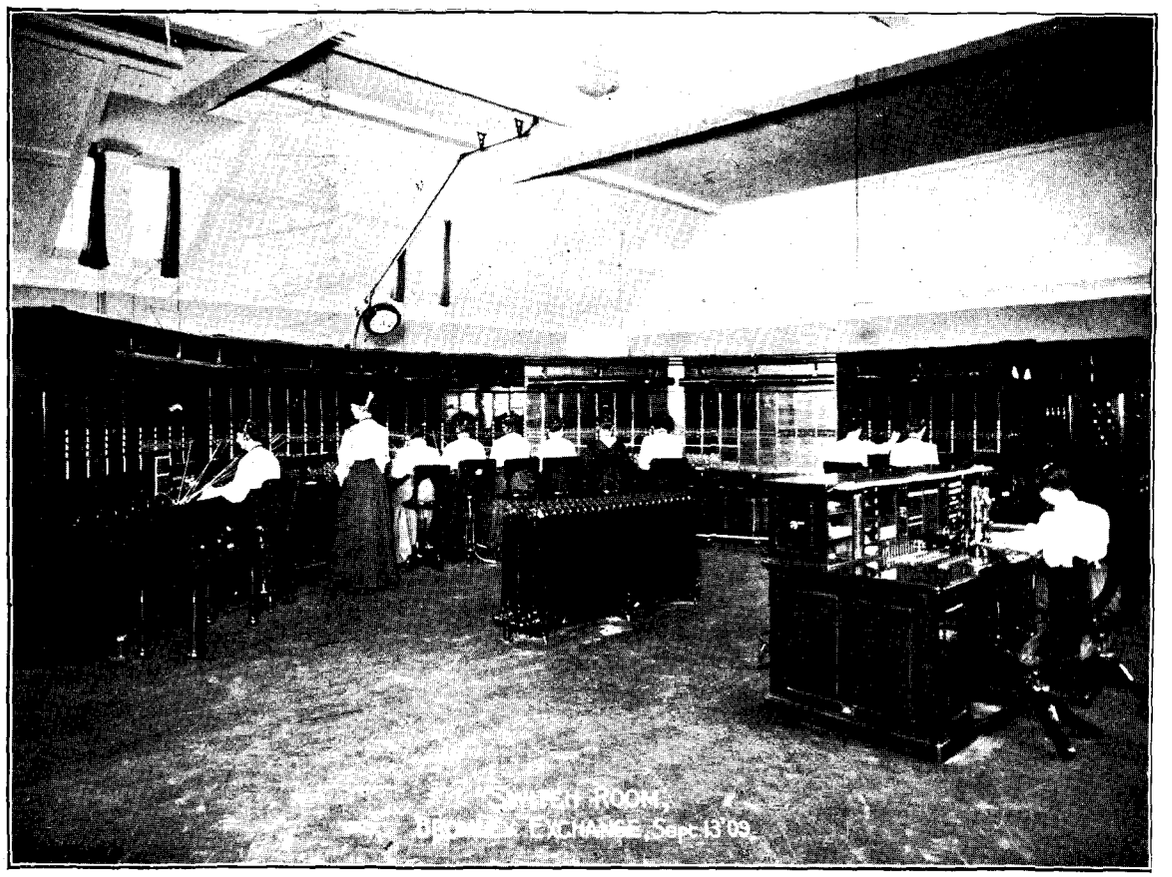
In 1902 the Company became more fully alive to the importance of studying the traffic side of the business, and since that time very great progress has been made in ascertaining the factors and applying the knowledge to traffic matters.

A regular system of service observation was established in all the large towns to ascertain correctly what grade of service was being given, and in the more scattered districts similar information was obtained by service inspectors.

This increased attention to the traffic problem has resulted in the continued efficient development of the Company's business and has greatly improved the service given to the public.

LEARNERS IN AN OPERATING SCHOOL.

By the death of Mr. Eli Heyworth, of Blackburn, on Jan. 21, 1904, there passed away a Director for whom the whole of his



SWITCH ROOM—BROMLEY EXCHANGE.

colleagues had a great esteem and admiration. Originally a member of the Lancashire and Cheshire Board of Directors, he had ever since the amalgamation in 1889 taken a prominent part in the administration of the National Telephone Company, and he will always be remembered as being primarily responsible for the appointment of Mr. Gaine as General Manager.

In 1904 an Investigation Department was established by the Engineer-in-Chief for the purpose of conducting researches upon the various engineering questions that are continually arising in connection with the business of the Company.

One valuable result has been the determination of transmission allowances for all circuits and apparatus used by the Company, and the application of loading to trunk and local junctions has had the effect of nearly trebling their transmission efficiency.

For the second time within three years a fire occurred at the London Wall Exchange, on Jan. 27, 1905, about six o'clock in the evening. It was fortunately discovered at once, and soon got under control, but the test room was entirely destroyed, and much damage done by water to the cables and other apparatus.

A new equipment, however, was nearly ready in an adjoining building, and by great efforts during the night the whole of the 3,819 subscribers' lines, 1,060 junctions, and 1,080 other connections were transferred to the new exchange, and were working satisfactorily on the next morning. As in the case of the disaster which happened at the same place in 1902, the cause of the fire was never discovered.

The first No. 9 type switchboard installed in this country was the one brought into use at Grimsby in July, 1906, and the first No. 10 was the Yarmouth board installed in March, 1909.

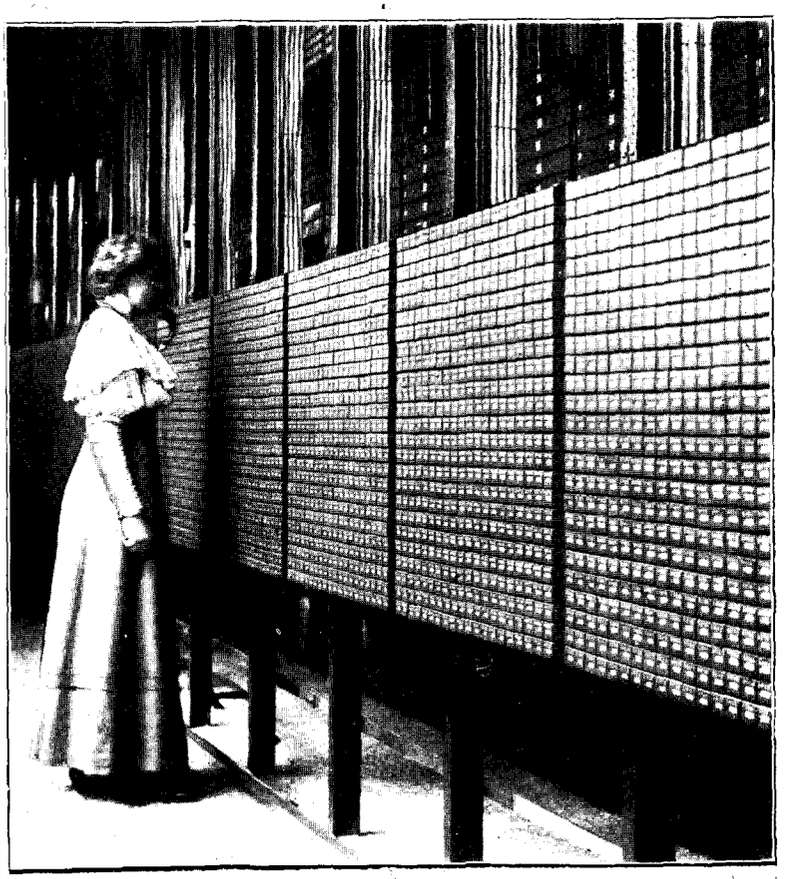
At the end of December, 1911, the Company had in operation 67 common battery exchanges with fitted capacity for over 149,000 direct exchange lines.

The organised tuition of telephone operators was commenced in London in 1899, when the first operating school in the world was opened. In 1906, to meet the growing needs of the service, the London school was moved from Telephone House to London Wall, where a suite of rooms was set apart for the purpose.

Since the equipment at London Wall was brought into use schools have also been instituted in the larger provincial centres. The accompanying photograph shows a typical class in one of the schools.

On Feb. 28, 1905, it was found that the Bank Exchange premises in Queen Victoria Street, and also the test room at Oxford Court, Cannon Street, London, were on fire. The fire in both cases was caused by a live rail at Westminster Bridge Station on the Underground Railway being put in contact with the Company's cable in the tunnel through a piece of metal troughing which had been left in contact by the railway authorities, and the result was that the test rooms in both cases were entirely destroyed, and 2,208 exchange lines and 2,078 junction lines disconnected.

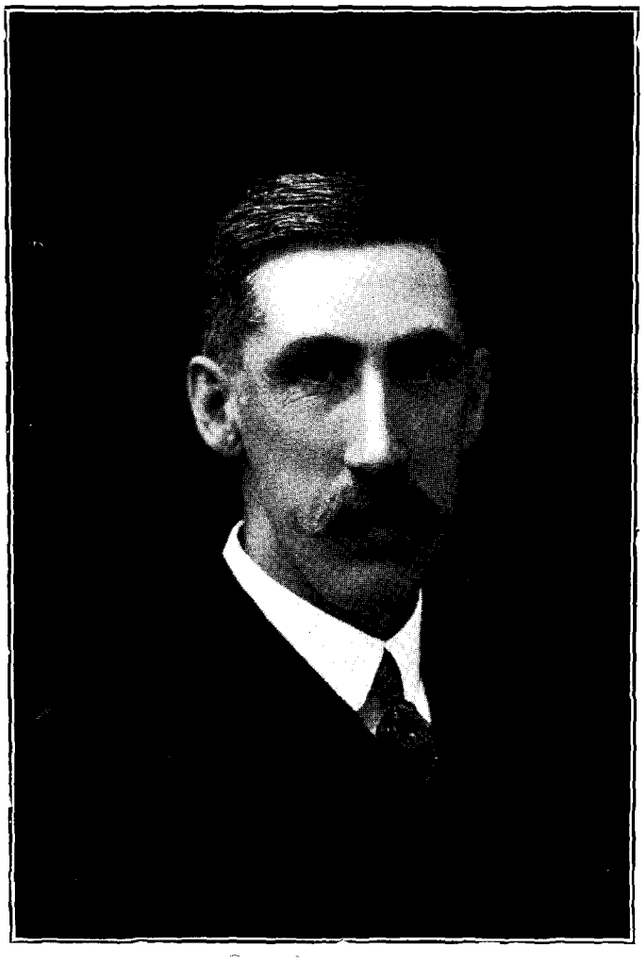
The last date at which the Postmaster-General could exercise his option under the license of 1884 of acquiring the Company's undertaking expired in 1904. There were then only two courses open to him of making the necessary provision to carry on the telephone business after 1911.



REPORTING TO THE REGISTER CLERK THE RECORD OF CALLS MADE BY SUBSCRIBERS.

One was to make an agreement to purchase the Company's property at the expiration of the licensed period and the other for the Post Office to construct duplicate plant. The latter, had it even been practicable, would have meant an enormous waste of money, and, towards the end of 1904, the Government entered into negotiations with the Company for taking over its plant, property and assets at Dec. 31, 1911. The settlement of the basis of purchase took some time to arrange, and the Postmaster-General drove the Company to make what it thought was a very hard bargain. The agreement was signed on Feb. 2, 1905, and, although the terms were very favourable to the State, the arrangement was challenged by certain members of Parliament, who apparently were of opinion that the Company had no claim whatever to any consideration, and was not entitled to even an inadequate price for its property. So another Select Committee was appointed once more to parade the Company's alleged shortcomings in endeavouring to provide a telephone service with every impediment placed in its way, and handicapped and thwarted by local authorities in various parts of the United Kingdom.

On May 22, 1905, it was ordered in the House of Commons that a Select Committee be appointed to consider the agreement of Feb. 2, 1905, between the Postmaster-General and the National Telephone Company, and to report as to any recommendations thereon whether it is desirable in the public interest that the agreement should become binding with or without modifications, and also whether the interests of the empl vees of the National Telephone



MR. FRANK GILL, M.Inst.C.E., M.I.E.E.

Company have been duly considered. Mr. Stuart Wortley was the Chairman of the Committee, and the proceedings commenced on May 25 and ended on July 25, 1905. Mr. Gaine, on behalf of the Company, again gave very admirable evidence, and the staff were also represented before the Committee by Mr. R. A. Dalzell and Mr. V. Alsop.

The report, amongst other things, recommended that municipal licenses should be granted, but that the National Telephone Company should not be given in such cases the extension of its license

OPERATORS' RECREATION ROOM.

to which it was entitled under the Act of 1899, and that the National Company should allow free intercommunication between the municipal and its own subscribers. The Government, however, refused to adopt these suggestions, which would have practically destroyed the National Telephone Company's business before the end of 1911.

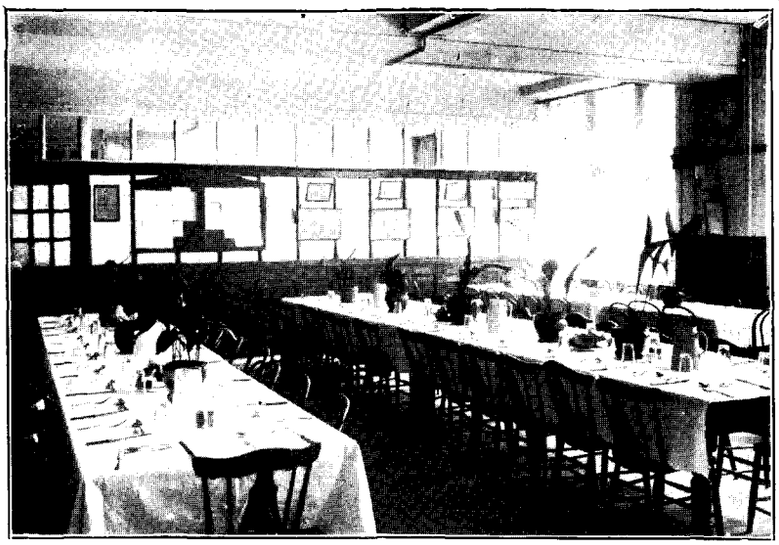
Much was made in the Committee's report of the evidence given by Mr. Gaine that he hoped the arrangements would enable the National Telephone Company's Shareholders to receive back the money they had put into the business, and this statement was seriously put forward as one reason why the agreement should not be ratified.

On Aug. 8, 1905, it was moved in the House of Commons "That the sanction of this House shall not be given to the proposed "purchase agreement between the Postmaster-General and the "National Telephone Company, Limited, unless the various "recommendations of the Select Committee are embodied therein."

Lord Stanley, the Postmaster-General, in dealing with some of the recommendations referred to, remarked: "The next point "was the question as to the granting of municipal licenses exceeding "the length of the period still left for the Telephone Company. "The Committee urged that no corresponding extension should be "granted to the Company. The Company would not agree to that, "and he was bound to say he thought their refusal was justified. "The proposal of the Committee was a practical infringement "of a statutory right. . . . There was a further condition that there "should be intercommunication at once, and without charge, between "the municipalities, to whom was granted a license, and the Com-"pany. That meant that if the Company had worked up a business "of say 300 subscribers in a town a municipality entering the field "would at once enjoy the advantage of having these 300 members, "not indeed as subscribers, but as communicants. He thought that "a most unfair condition, and he was not surprised that the "Company would not agree to it."

The only amendment of any importance made in the agreement of February, 1905, was a slight alteration in the purchase clauses so as to bring them more into harmony with what are known as "tramway terms." As settled by the supplemental agreement of Aug. 8, 1905, they were as follows:—

(1) The value on Dec. 31, 1911, of all plant, land, buildings, stores and furniture purchased by the Postmaster-General in pursuance of the provisions hereof shall be the then value (exclusive



AN OPERATORS' DINING ROOM.

of any allowance for past or future profits of the undertaking or any compensation for compulsory sale or other consideration whatsoever) of such plant, land, buildings, stores and furniture, *having regard to its suitability for the purposes of the Postmaster-General's telephonic service*, and in determining the value of any plant no advantage arising from the construction of such plant by leave of the Postmaster-General upon any railway or canal over which the Postmaster-General possesses exclusive rights of way for telegraphic lines shall be taken into account.

(2) The value on Dec. 31, 1911, of any licensed telephonic business of the Company which by virtue of the agreements referred to in the First Schedule hereto or of any other agreement in writing between the Postmaster-General and the Company can be transacted as aforesaid after Dec. 31, 1911 (apart from the plant, land and buildings used therein, which are to be valued as hereinbefore in this clause provided), shall be such sum as may be agreed between the Postmaster-General and the Company, regard being had to the net profits of such business and to the circumstances and conditions under which the Company would carry on such business after Dec. 31, 1911.

(3) The value on Dec. 31, 1911, of any private wire business of the Company (apart from the plant, land and buildings used therein, which are to be valued as hereinbefore in this clause provided) shall be taken to be three years' purchase of the net profits of such business on the average of the three years ending on Dec. 31, 1911.

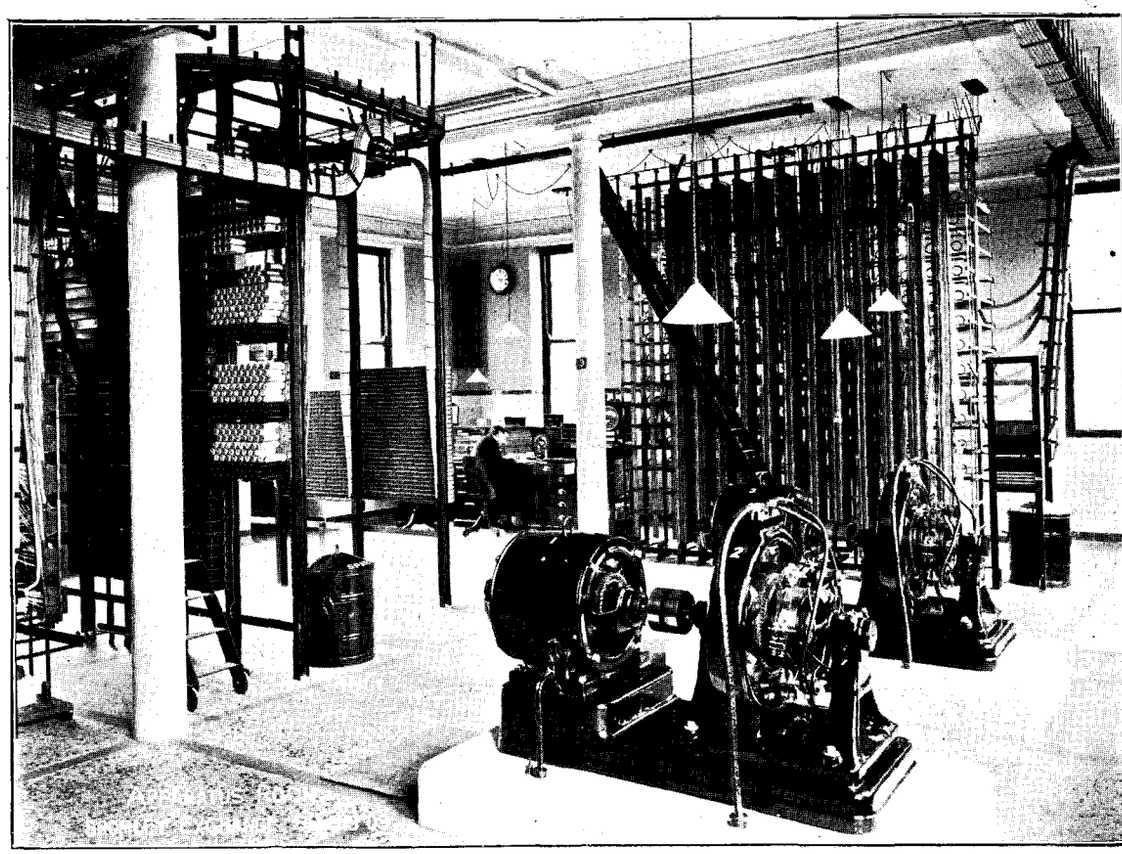
(4) All matters of difference arising under this clause shall be determined by arbitration.

The agreement left the staff in a very precarious position, and for the protection of the thousands of men and women who had built up this great and successful business, the Staff Transfer Association was formed with the object of bringing pressure to bear on members of Parliament and others to secure fair treatment for the staff when the transfer took place. The first result of its efforts appeared in the recommendation of the Select Committee that no servant of the Company should suffer on the transfer of the business to the State, and Lord Stanley, the Postmaster-General, made the very satisfactory statement in the House of Commons on Aug. 8, 1905, that, with the exception of officers of the Company in receipt of salaries of £700 per annum and upwards every member of the staff would be taken into the service of the Post Office when the Company's license expired. There were, however, many important details to be settled before the staff could feel secure, and in 1911 Mr. Herbert Samuel, the present Postmaster-General, by the sympathetic way in which he treated the Company's representatives, earned the lasting gratitude of every member of the staff. The task of placing the 18,000 servants in their proper classification was a very difficult one, but Mr. Samuel stated his determination that the efficient staff which had served the National Telephone Company so well should be treated not only fairly, but generously, and thanks to Mr. Samuel's attitude, there is every prospect of his taking over the control in 1912 of a loyal and contented telephone staff.

The subjoined figures show the great development which took place in the Company's business during the ten years ending Dec. 31, 1905:—

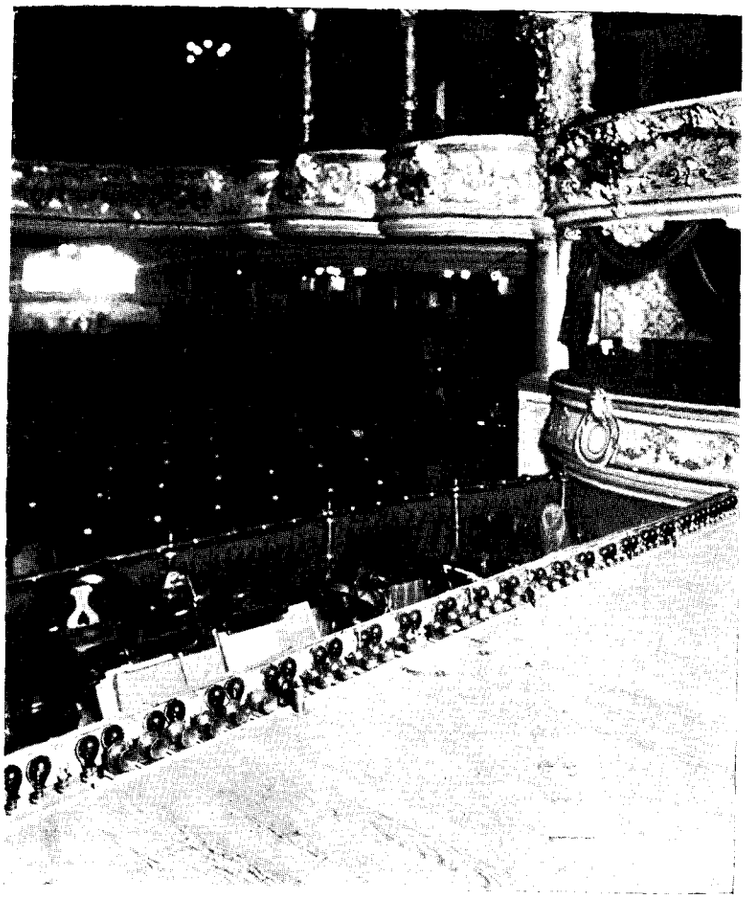
	Years	
	1895.	1905.
Gross revenue	£819,035	£2,212,359
Post Office royalties ...	74,675	206,455
Net revenue	744,360	2,005,904
Working expenses	424,165	1,275,161
Profit	£320,195	£730,743

	As at Dec. 31	
	1895.	1905.
Capital expenditure ...	£4,902,933	£11,287,195
Reserve fund	350,630	1,912,475



APPARATUS ROOM—BROMLEY EXCHANGE.

In March, 1906, came the resignation of Sir Henry Fowler, President of the Company, on his accepting office with a seat in the Cabinet under the Liberal Government. The valuable services rendered by Sir Henry Fowler to the Company were warmly



AN ELECTROPHONE INSTALLATION IN A THEATRE.

acknowledged by the Shareholders at a subsequent meeting when he bade them farewell.

Mr. George Franklin succeeded to the presidency, and Mr. Samuel Herrick Sands, a leading Banker of Nottingham, and who had looked after the interests of the Company in that city for many years with very satisfactory results, became the Vice-President.

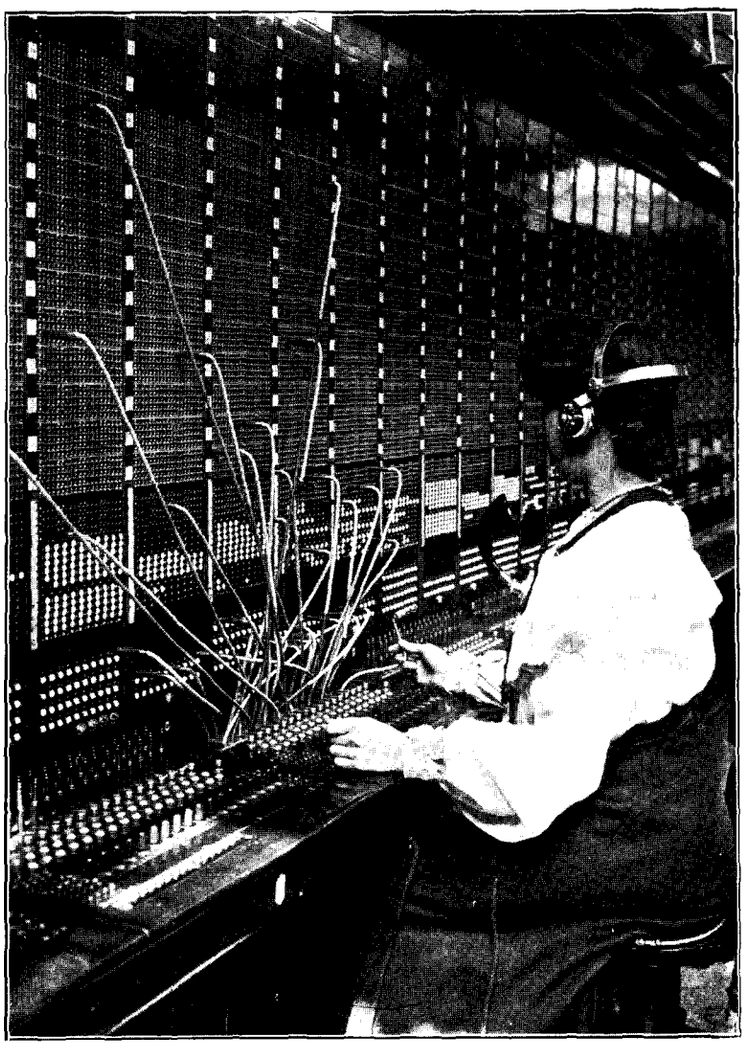
THE NATIONAL TELEPHONE JOURNAL was started in April, 1906, and from its inception was a great success. Its motto was "By the Staff for the Staff," and its pages show how very diversified are the gifts and abilities of its many contributors. Its circulation was not confined to the officials of the National Telephone Company, and it is now well known and appreciated throughout the Old and the New Worlds.

In April, 1907, the Lord Balfour of Burleigh again became a Director of the National Telephone Company.

In January, 1907, by the earthquake in the Island of Jamaica, the Company lost a Director in Sir James Fergusson, and in the following July a great disaster overtook the Company in the death, after a brief illness, of Mr. Gaine, the General Manager. The mournful event was feelingly referred to by the Secretary of the Company, who presided at the Annual Staff Dinner held in May, 1908, when he remarked "that, since they "had last met, a great calamity had befallen them in the tragic "event which took from them their chief, and robbed them "of a friend for whom they had a real affection. He desired "to take that opportunity of saying how much he admired "Mr. Gaine for those qualities with which he was so richly "endowed, and which made him what he was, a born leader of "men. Mr. Gaine never knew when he was beaten. Time "and again, when things looked black for the Company, he "either turned apparent defeat into victory or brushed aside "the weapons of their adversaries so that they passed by harmlessly, and they could not over-estimate the value to the "Company of the example which he set the staff of courage, "perseverance and determination. Mr. Gaine was called away "before he saw the full fruition of his long and strenuous "work, but his spirit would animate them and be with them to "the end."

It is impossible to express the deep and sincere grief that came to all those who had been associated with Mr. Gaine in the wonderful development of the National Telephone Company's business which had taken place during the time that he had been General Manager.

To perpetuate his memory, the staff contributed to a "Gaine Memorial Fund," which has since been used in assisting necessitous members who, through sickness, or under the stress of modern business, have fallen out of the ranks, and it has helped many to regain health and strength to continue the battle of life. Benevolent societies have also been started, to the funds of which the Company has contributed, and these societies have been of material assistance to many hundreds of the Company's employees.



A SPARE POSITION AT THE SWITCHBOARD.

A little later came the further sad news of the death of the great scientist, Lord Kelvin. As Sir William Thompson he had been Consulting Electrician to the National Company for many years, and was beloved by all those who were fortunate enough to

know him, not only for his great intellectual gifts, but also because of his amiability and splendid character.

The position of General Manager was not filled up, Mr. George Franklin the President, also undertaking the duties and responsibilities of Managing Director. As Mr. Gaine was likewise the Solicitor to the Company, it was necessary to appoint his successor in that office, and the Board made a wise and excellent choice by selecting Mr. William Edward Hart, the Deputy Town Clerk of Sheffield, who, by his sterling abilities and unvarying courtesy, soon won the confidence and affection of the Directors and his *confrères* on the staff. Mr. Stanley J. Goddard, who had rendered valuable services to the Company as Mr. Gaine's assistant, was appointed to a new position as General Superintendent, and in that capacity was of material assistance to the Managing Director in the troubled and anxious years through which the Company has since passed.

In 1907 the Company persuaded the Postmaster-General to agree so far as the provinces were concerned, to abolish the flat or inclusive rate of charge for all new subscribers.

This was the greatest change of policy in telephone administration which had taken place since the Company's license was granted, and the response was immediate and satisfactory, as it enabled a large number of small users to take advantage of the telephone service. It raised, however, a shower of protests from the various Chambers of Commerce, who considered that without any knowledge they were quite competent to fix the rates to be charged by the Company for the service which it provided.

Representatives of the Associated Chambers of Commerce were appointed to confer with the Company, and several meetings were held with the President and head officials at Telephone House.

The whole problem was a most complex one, and the inquiry left the Company's attitude with regard to the measured rate which had been introduced quite unaltered. It was conclusively proved that the flat rate was indefensible, and that subscribers having to pay in accordance with the use made of the service was the only sane and practical system of charge.

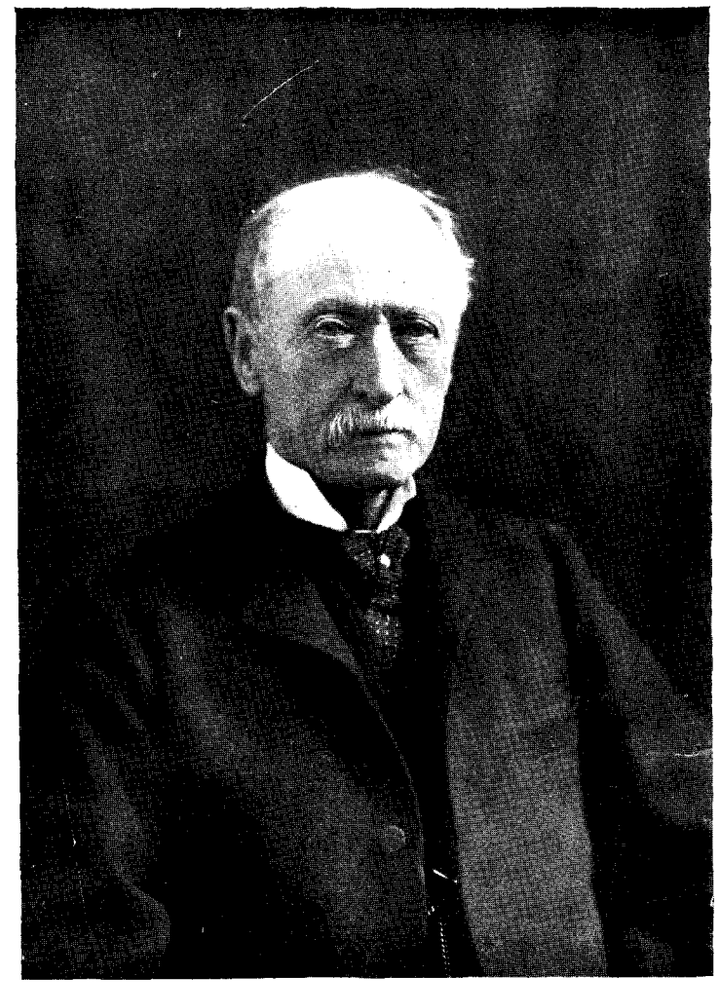
In 1907 a friendly action was commenced to obtain the decision of the Courts as to the legality of the Postmaster-General claiming royalty on private wires erected by the Company between two different persons or firms, and the Court of First Instance decided in favour of the Postmaster-General. The Company succeeded in getting that decision reversed in the Court of Appeal, but finally, in the House of Lords, it was determined that the Postmaster-General was entitled to the royalty claimed by him.

In 1907 the Company installed central battery private branch exchanges on board the new Cunard liners s.s. *Lusitania* and *Mauretania*. Telephone sets were installed in all the first-class state rooms and in the cabins of the various officers, and ten exchange lines were provided on each ship. Provision was made for connecting these latter with the shore system when the vessels were in dock or at the landing stage, so that at such times a full exchange service with all the exchange subscribers to the National system could be given.

These vessels were the first to be so equipped and, to meet the abnormal conditions under which the installations would have to work, many special features were introduced.

In the early part of 1908 the President of the Company warned the Postmaster-General that, unless some arrangement could be made as to future capital expenditure, the National Company would have to restrict that part of its outlay to works which would be remunerative within the period of the license. The difficulty proved to be impossible of solution, with the result that during the last few years there has been a great falling off in the development of the telephone system, and there will be an enormous amount of arrears to be dealt with when the Postmaster-General assumes possession of the telephone undertaking.

The agreement of 1905 gave the Post Office the right to object to buy any of the Company's plant in competitive areas which the Postmaster-General considered would be unsuitable for the actual requirements of the Postmaster-General's telephone service, and at the end of 1910 a number of notices were served on the Company on behalf of the Postmaster-General objecting to buy certain plant, land and buildings in the Metropolitan area and elsewhere. The reason given generally was that the plant, etc., was unsuitable, as it was not wanted by the Post Office, because the Department intended to erect duplicate plant to supersede the Company's exchanges, lines and instruments. The Company contested this reading of the agreement, and the matter was fought out before the Railway and Canal Commissioners and in the Court of Appeal at great length and prodigious cost. The questions involved were of great intricacy, but after hearing the evidence on behalf of the Company, given in a masterly manner by Mr. Frank Gill, the Engineer-in-Chief, and his assistant, Mr. W. W. Cook, a compromise was arrived at with very satisfactory results to the Company. Mr. W. E. Hart, the Company's Solicitor, is also entitled to great credit for the happy termination of the proceedings, for his was a very difficult task, as he had opposed to him Sir Robert Hunter, K.C.B., the Solicitor to the Post Office, with his unrivalled knowledge



MR. SAMUEL HERRICK SANDS.

of telephone affairs. To prepare the details of the plant, property and assets to be transferred to the Postmaster-General as at Dec. 31 1911, an Inventory at the joint expense of the Postmaster-General and the Company was started in October, 1910, the enumeration being made by the Company's officials, and checked as the work proceeded by the officers of the Department. The smoothness with which it has been carried out is due to the care and ability displayed by the Company's staff in preparing the forms and organising the work throughout the United Kingdom. The combined cost will probably reach about £250,000 before the work, including the pricing, is completed, and the Company's claim presented to the Postmaster-General.

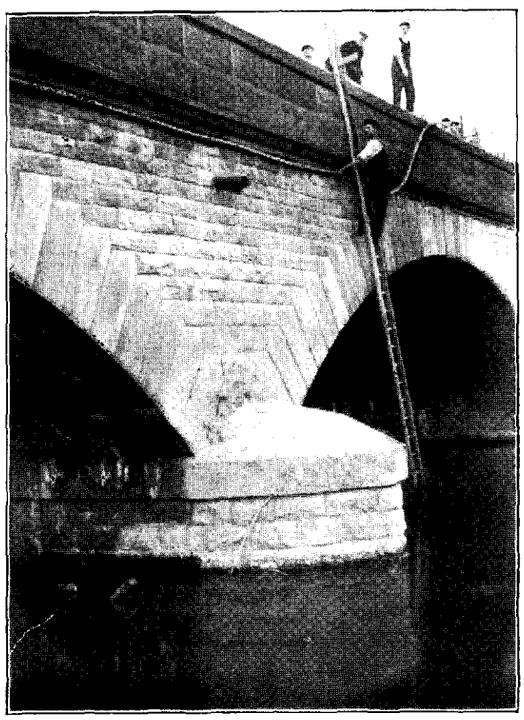
At the end of the year 1910 the Company's capital expenditure (excluding land and buildings) stood at £15,316,432, and it had installed and was working 534,253 stations.

The gross revenue for the year 1910 was £3,422,423, Post Office royalties £329,494, working expenses £1,987,357, and profit £1,105,572.

The royalty paid by the National Telephone Company, and the companies which it had absorbed up to the end of 1910, was £3,457,001, and with the further sums due in respect of 1911 will reach the enormous total of £3,670,000 when the Company's license expires.

This history would not be complete without mentioning some of the other officials of the Company who, under the direction and control of the Board, have made the telephone business such a remarkable success.

Several of the superintendents have already been referred to, but Mr. A. Coleman of Birmingham, Mr. J. C. Chambers of Leeds, Mr. F. Cowley of Dublin, Mr. R. Shepherd of Liverpool, and Mr.



FIXING TELEPHONE CABLE ON A BRIDGE

R. A. Dalzell of Bristol, with their efficient local supporters, can also justly claim credit for having largely contributed to placing the Company in the very advantageous position which it at present holds.

It is not unnatural that sincere regret should pervade the members of the staff at the severance of the ties which have united them for so many years with their present chiefs, or that to some of those who pass into the service of the Postmaster-General may come the sadness of remembrance, soon, it is hoped, to be replaced by the happier feeling of hope and confidence in the future.

The last few years have been full of anxieties for the Board of Directors and the Company's chief officials, as the negotiations with the Post Office have, in many instances, culminated in prolonged struggles, not only in the courts of law, but in the almost daily conferences with the able men who control the affairs of the Post Office Department.

On Mr. Franklin, the President, has fallen the heaviest burden, and it will never be known how unsparing he has been of himself in fighting the battles of the Shareholders and in safeguarding their rights and property. That there still remains, perhaps, the hardest fight of all, cannot be denied, for the price that the Postmaster-General will have to pay for the valuable business he is acquiring, has still to be settled. That the result may be a satisfactory one to the Company's Shareholders is a consummation most devoutly to be wished, and those who know and appreciate Mr. Franklin and the officers of the Company, who have given him such loyal and unstinted support, have a happy confidence that all will be well with the Company in the end.

The trials, tribulations and triumphs of the past 33 years will soon be only a memory. Through storm and sunshine, good fortune and bad, the National Telephone Company has moved to its appointed end, conscious that at all times it has given of its best in earnest endeavour to do its duty, often under circumstances of extreme trouble and difficulty. That it has not realised its highest ideals is not the fault of the Company, for the forces arrayed against it have on many occasions proved to be too powerful. It has been attacked and threatened in quarters where it had a right to expect help and encouragement, but it confidently anticipates that the verdict of posterity will be that the National Telephone Company deserved well of the nation.

LONDON'S "FINAL MUSTER," DEC. 30, 1911.

IT was a wonderful gathering. There were 900 present; more had been expected, but, as so often happens, the estimate was liberal. To judge by the crowds that thronged reception rooms, staircases and galleries of the Holborn Restaurant, it would have been no surprise to learn that a few hundreds more than the actual number were there. To judge also by the well-known faces one was constantly seeing, everybody of note in the telephone work of London must have been there. There was a strong and representative Head Office contingent, including Mr. Anns, Mr. Goddard, Mr Gill, Mr. Hart, Mr. Cook and Mr. Alsop. Mr. C. J. Phillips, Mr. Dalzell and Mr. E. J. Hidden were amongst former London men who took part with their old colleagues in saying good-bye to the old Company. Practically all the senior officers in the Metropolitan service were present, and every department sent of its best, both old and young, to grace the festival. The charm inseparable from the presence of ladies was there in rich measure; many officers were accompanied by their wives, and the lady members of the staff were handsomely represented. The prevailing note of the gathering was one of cheerfulness, and it is no exaggeration to say that from 5.30 p.m., when guests began to assemble, until 12.1 a.m. on Sunday, when a few gentlemen desired to relieve the thirst induced by dancing and found themselves unable to do so, vivaciousness and hilarity were the chief characteristics. "A short life and a merry one" seemed to be the motto for the night, whether in the crowded dancing hall where all was gaiety and bustle, the secluded nook, in which young people, not necessarily of the same sex, retired for a much-needed rest; or on the dark stairway leading to the musician's gallery, where an amorous couple were rudely interrupted by the flying footsteps of a steward hastening with a message to the leader of the orchestra.

At dinner the major part of the guests were seated in the King's Hall, which, with its crowded galleries and corridors, presented a brilliant spectacle; the remainder were accommodated in the Crown Room and the Throne Room The enjoyable dinner was tastefully and expeditiously served by a large staff under the supervision of the manager of the Holborn. The only toasts afterwards were "The King" and "The Chairman." The former was proposed by Mr. C. B. Clay, Metropolitan Superintendent, who presided, and the audience honoured the toast by standing and singing the National Anthem. The latter was proposed by Mr. L. Harvey Lowe, Assistant Metropolitan Superintendent, who expressed the disappointment of the staff that Mr. Clay would not remain with them to take them into the Promised Land. They were there, he said, not to commemorate their transfer to the State, but rather to consummate their services to the National Telephone Company and to cement the lifelong friendships they had made amongst the staff. "We enter into the service of the State," Mr. Lowe continued, "in a spirit of hopefulness, and it is no mere optimism on my part that makes me take a bright view of the situation." Mr. Lowe was followed by Mr. George Franklin, President of the Company, who made a brief and sympathetic speech, and at the outset paid a high compliment to Mr. Clay for the services which he had rendered to the Company and to the telephone service in London. Mr. Franklin referred to the difficulties under which the Company had fought its way to success, and expressed the hope that, although the business had passed over to the State, the shareholders would have a fair, if not a handsome return on their investment

Mr. Clay, who spoke very feelingly in acknowledging the toast, referred to his 30 years' work in the telephone service and the unvarying loyalty and support which he had always received from his staff. He was hopeful that those who had done so much to build up the large business of the National Telephone Company would be equally energetic and successful in building up the telephone business of the State.

After the dinner a Bohemian concert was held in the Throne Room, with Mr. H. Deane in the chair. There was a remarkably talented series of artistes on the programme and their efforts delighted a large and appreciative audience, which would have been augmented had so many not been unable to tear themselves away from the dancing rooms, where a gay and animated spectacle charmed both those who took part and those who looked on. The King's Hall and the Crown Room were both thrown open for dancing, Mr. J. Stirling acting as M.C. in the former, and Mr. H. G. Corner in the latter. Certainly nothing could have been prettier than the mingling of colour and movement as seen from the galleries of the King's Hall, while the dancers moved in and out through the figures of the lancers or circled round the room in the rhythm of the valse.

A few minutes before midnight hands were joined, "Auld Lang Syne" was sung, three hearty cheers rang out, other three followed for Mr. Clay, and so the curtain fell upon the last act. *Le roi est mort; vive le roi.*

MR. U. N. BETHELL ON ORGANISATION.

THE following report of an address by Mr. U. N. Bethell, Vice-President of the American Telephone and Telegraph Company, to the Telephone and Telegraph Society of New England at Boston on Oct. 17, is reprinted from *New England Telephone Topics*:—

Your president has made some eloquent remarks about organisation, and I had thought that I would talk to you a bit to-night, with his permission and yours, about what is being done, and what has been done, in attempting to improve the national organisation of the Bell system. There is no standard type of organisation that I wish to present or advocate. I know, without having particularly quizzed your president and others on the subject, that you have had papers and discussions here about organisation. I am going to avoid the pitfall of advocating one type of organisation as against another.

Once a definition was given something like this: "A transposition is a transposition wherever it occurs." Now, an organisation is not an organisation wherever it occurs. There may be a most excellent organisation in one place, which, transplanted to some other place, becomes a very bad organization. I have seen charts or diagrams of organisations transported from one part of the country to another and adopted, and the results have been something like what would have occurred had a number of men going from a New England town to some new western settlement chosen a leader and the leader had said, "Back in our New England town we had a doctor, a preacher, a dentist and a lawyer. Bill, you be the doctor; John, you be the preacher; James, you be the dentist; and Edward, you be the lawyer." A transplanted commercial organisation sometimes works much as a transplanted social organisation would work with men unfit for the duties assigned to them.

An organisation may be splendid for one time or period, but quite the reverse for some other time or period. There may be a special job to do. It may be constructing a great plant—as, for instance, in Baltimore after the great fire. A particular type of organisation was necessary for that occasion, and for a long time after that great calamity it was necessary to maintain a particular type of organisation, which it would have been the wildest sort of extravagance to have maintained permanently. An organisation should change as time proceeds and conditions change.

A form of organisation may be a most excellent one because of the men that are available to fill particular places, and it may be a most unsuitable one because of the lack of available men, or the abundance of suitable men for an organisation of some other form. So I say that there is no particular type of organisation which in this great industry of ours can be imposed upon any and all localities, at all times without regard to whether or not there are available men. An organisation must take form with the growth of the business. It must go through a process of evolution, and often there must be an elimination of parts which have been outgrown and have become unnecessary.

We all recognise the fact that in any large undertaking some form of organisation is necessary, some systematic way of doing the business; but very often—and I want to emphasise this—the routine methods followed, and the significant reports that are made, are of vastly more importance than the form of the organisation.

And there is another thing that is of vital importance—absolutely essential to the success of any organisation—and that is co-operation. It is essential whatever the form of organisation there must be team work between the various departments if it is departmental, and between the various divisions if it s divisional, but particularly must there be the best sort of team work if it is a departmental or so-called functional organisation.

It is also necessary to have certainty in an organisation. One must know where his instructions are to come from, whence he is to expect them, and whom he must direct and be responsible for. One in authority, when giving orders, should always follow the established "lines of authority." There are some great organisers and some very successful executives who sometimes forget, unintentionally perhaps, the lines of organisation, and give their orders direct to people who should receive them, if at all, from other quarters. But in any organisation one must expect occasional lapses of this sort, and, nevertheless, do his duty as best he can. I am like a guidepost now, pointing the way, although I may not follow it myself always; but to the man in authority I would say that it is always well to observe the lines of authority, because without certainty and without such observance what might be made to operate as a splendid organisation, will become demoralised and present the appearance of a baseball nine just before the game is called—practising with three or four balls perhaps, but not playing ball.

Since I came into this room, some one has said, "I think the most important thing is team work." I agree that the most important thing is team work. But there can be no team work if there is no steady directing hand. Kipling says: "The law of the jungle, as old as the sky—the strength of the pack is the wolf, and the strength of the wolf is the pack." But we are far from the jungle, and the general in command who habitually oversteps the lines of authority is in danger of reducing his army to a mob.

We have all heard a great deal of discussion as to the relative merits of different forms of organisation. We are familiar with discussions on divisional *versus* departmental. That is what they call it in railroad parlance. We call it territorial *versus* functional. There is a great deal of haziness about these definitions. It is almost impossible at times to classify an organisation. Our so-called functional organisations are sometimes called "three-column" organisations. "Three-column" is a misnomer. It must have been adopted by some one who for the moment forgot that there were other things than plant, traffic and commercial, in the business. Those are great branches of business, but we must not forget, for example, the legal, the accounting and the financial departments. Railroads are said to be divisional or departmental. The Pennsylvania Railroad Company is set up by nearly all writers on the subject as the typical divisional road, and yet, when you study the organisation of the Pennsylvania railroad system—a magnificent system—you find that there is a vice-president or other headquarters' official in charge of each of the functions involved in operating a great railroad. The New York Central is set up by authorities on the subject as having a strictly departmental organisation; yet when you study the organisation of the New York Central you find that, notwithstanding the fact that thirteen departmental officers—and I parenthetically criticise this feature for obvious reasons—report to the vice-president and general manager, there are still ten division superintendents.

It is almost safe to say that there is no such thing as a purely departmental or a purely divisional organisation in large railroad operations. The English railroads follow the departmental form of organisation. England, you know, or England and Scotland, is a very snug little territory, there is a small area to be supervised, and there it is very proper for the railroads to be organised on the departmental plan. But that furnishes no convincing proof that that form of organisation would apply to the great railroad systems in this country.

There is only one other railroad system to which I wish to refer to make clear this difference between so-called departmental and divisional, or territorial and functional organisations, and that is the organisation of the Harriman Lines. As you all know, the Harriman properties consist of a number of separate units, railroads and steamship lines. Each of these units has its own full and complete operating organisation, and during the later years of Mr. Harriman's life he was president of them all. He had a staff, the chief officers of which were a general counsel, a financial man, a traffic man (using traffic in the railroad sense, the equivalent of our commercial) and an operating man. His headquarters' staff only supervised; they did not direct. Recently, only a few days ago, I noticed that Judge Lovett had yielded the presidential title in each of these great organisations to somebody else; but he acts as chairman of the executive committee of each of the companies, with a director of maintenance and operation and a director of traffic—or, as we would say, commercial—and the whole is run as one system, so far as supervision is concerned. That comes nearer to the type of organisation which seems to apply to our business broadly, than any other form.

If I may be permitted now, I should like to say something as to our New York organisation, telling you briefly of its evolution, even though I must be a bit personal in so doing. Some years ago, when I was with the New York and New Jersey Company—Mr. Hudson was then president of the A. T. and T.—Mr. Cutler, of blessed memory, called me from Boston and asked me to meet him the next morning in New York. I went over, trying on the way to think why Mr. Cutler should go to the trouble to make such a definite appointment, and wondering what he could want to talk with me about. He plumply asked me what I would think of being General Manager of the New York Telephone Company. Well, I did not think much, because I did know much—not nearly so much as I know now—about running a telephone business. But I accepted it, and I succeeded one of the dearest men on earth, well known to a great many here, Colonel Parker. Colonel Parker was a very large man. I went into Colonel Parker's office and took his chair. The colonel had a very comfortable chair, one of these large oak chairs with a ridge in the bottom, rising up in the centre. He was supposed to be large enough to fill both sides nicely, but I found it more comfortable to sit on one side of the raised part. I was not much larger then than I am now. Somebody came into the office and addressed me as colonel, and I modestly waved away the decoration. "Well, you succeed Colonel Parker, and don't you have the same title?" "No." He looked down at the chair and said, "Oh, I see!" So I did away with the chair. The job was too big too, but I stuck to it, and sought salvation by heeding the injunction of some good angel that whispered the one talismanic word—ORGANISE.

A short time after that I had a commission from Mr. Fish. He sent me down to the C. and P. I went, under a leave of absence of six months, but meanwhile I was to perform all my duties in the New York Company. After a while the Bell of Philadelphia was added to the group, and shortly after that the New York and Pennsylvania; then the Central New York and the Empire State, and then the New York and New Jersey and the Hudson River. So I had this beautiful group of companies, each a splendid undertaking in itself, but I was the only officer common to them all.

Each of those companies had a man in charge of each of the great departmental functions, at least five to each company. There were seven companies. I had therefore at least 35 direct subordinates. I got a very good pair of skates and travelled most of the time until I was threatened with a suit for divorce, when I concluded that it was time to do something that would enable me to stay at home a bit. That was entirely too many companies for effective supervision on the part of any one, and I am very free to say that they did not have effective supervision.

It was borne in upon me from the very start that there ought to be a consolidation of those organisations. It became necessary after a time to make great changes in the financial status of the companies, but that is another story. The organisations—and that is what I wish to refer to to-night—were brought as rapidly as possible into three great organisations, one operating Philadelphia and the south, one operating New York State, except the Metropolis, and one operating the Metropolitan district. Then, when Mr. Vail came in, it was possible to make a financial and actual consolidation of all of the companies, seven in number, in New York State, including the Bell of Buffalo to which I have not heretofore referred, and with which I had had no connection up to that time, and also to consolidate or bring into the consolidation the Pittsburg Company, which had not been in our group before.

After a great deal of experimentation and study we felt, considering the extent of the territory, with its over two hundred millions of investment, its vast number of subscribers, and the importance of its business, that we could not safely adopt one so-called functional organisation, with headquarters in New York, and spread it over the whole territory. We went just as far in that direction as I think it was possible to go, when we made one organisation for the Metropolitan district and the State of New York and another for the Pennsylvania

district, making common officers for both in the accounting and in the financial departments, but keeping operating, broadly speaking, including what we call commercial, traffic, plant and engineering, in two separate parts, one with headquarters at Philadelphia and one with headquarters at New York—a sort of double-ended organisation. I am free to confess that I don't see that in years to come, if ever, we need attempt to get away from that form of organisation. But it is not urged as a typical form of organisation for the rest of the country.

I have related these facts as to the New York organisation simply as an illustration of what should be thought of in considering a suitable organisation for the United States as a whole. Some at times have favoured a so-called *functional organisation for the whole United States; but the fact that a functional* organisation has worked well in New York City or worked well in New England, or worked well over the whole State of New York, is not conclusive evidence at all that it would work well over the whole United States. For one, I am frank to say that I do not for one moment think that it would. To effectively supervise there must be a reasonable number of operating units. Of course, in these days it is very difficult to say what is "reasonable" and what is "unreasonable." But my own judgment in this matter is that ten operating units are about as many as can be directed and supervised efficiently by one chief executive, however able, and a staff of expert supervisors. Even then the chief executive must not forget and not allow others to forget the sentiment once expressed by the president of the Santa Fe that the whole secret of successful administration lay in the words —organise, deputise, supervise.

Something approximating this general plan has been followed with reference to our organising for the whole country so far as the work has gone; there are, speaking broadly, approximately ten great divisions. There are the New England, the New York, the Chicago, the Southern Bell, and the Cumberland divisions, five east of the Mississippi; there are the North-West, Central West (Missouri, Kansas and Oklahoma), the South West, the Mountain States and the Pacific, five west of the Mississippi. I have not spoken of Cincinnati or Providence or Southern New England. These relatively to the whole, are small in area, and they work so harmoniously with the other organisations that it is not necessary to take them into consideration in this general presentation of the matter. This organisation is something like that which I have outlined as the organisation of the Harriman Lines, but, because we cover the *entire country* and because each of our divisions is joined to all the others so intimately, to form one great national network, there must be the greatest of harmony everywhere. There is a necessity for team work and for co-operation in the management of these enterprises as a national undertaking that does not exist in the Harriman organisation or in any other organisation of which I know or can conceive.

I will now speak briefly of the organisations of the other groups. When the Chicago group, covering Wisconsin, Michigan, Illinois, Indiana and Ohio was formed, those companies were brought together under one set of officers, a president common to them all, one treasurer, one general counsel, one auditor, one general manager, and one vice-president in charge of traffic or commercial. Here was a territory that seemed peculiarly suited for the trial of a functional organisation on a large scale. That is a very great territory. It has a population of eighteen or nineteen millions and a very large investment. Chicago, a dominating city for the entire territory, was practically in its centre. The new organisation is working satisfactorily and I believe it will prove in. But becuse they have a purely functional organisation there is not as yet *convincing proof that it is a proper type of organisation for every* other division. In the North-West Territory they have a functional organisation also, something like yours here in New England. There three companies were brought into one organisation, and at first it was impossible to so adjust things as to have one man performing the same duties and bearing the same title in all the companies. That has all been adjusted, however, and now the North-West group is practically on a functional plan.

Now, coming to the Mountain States—the Colorado and the Rocky Mountain Bell—there was an entirely different problem confronting us. Not long ago the publicity agent of the Rocky Mountain Bell Company rather boastingly asserted in some of his literature that there was then no place in the territory more than one hundred miles from a telephone. I knew you New Englanders would laugh at that, but remember, if you please, that in the territory covered by the Mountain States Company there are some 612,000 square miles. The area of Massachusetts is 8,040 square miles. Here are the Mountain States in one organisation with, in round numbers, 612,000 square miles. That is over 76 times as large as Massachusetts, and with little more than two-thirds of the population of Massachusetts, which is three million, three hundred and sixty odd thousand, while the population of this vast territory, covering the great States of Montana, Idaho, Wyoming, Utah, Colorado, New Mexico and parts of Arizona and Texas, a small part of Texas, that is about as big as Vermont, or a little bigger, that territory, 76 times as large as Massachusetts, and with only two-thirds of the population of Massachusetts, presented a different proposition. There the functional type of organisation, such as we have here, and in New York and Chicago, seemed absolutely out of the question, and there they have adopted a territorial form of organisation. Still, on the Pacific Coast, the Pacific Company, covering an area of over 500,000 square miles, has a functional organisation, and they get excellent operating results. But we must remember that the population of that area is distributed in several large groups, and I imagine that each function has a representative of excellent type in each group, and that there is splendid team work.

The Southern Bell has a functional and the Cumberland a territorial organisation. The South-West and the Central West each has a functional form of organisation, but both Mr. Pettengill and Mr. Gleed think there should be some modifications, because of the great area covered—some of it only sparsely settled.

In time it is hoped that there will be organisations of varying types in different territories, each made to suit the conditions to be contended with, all will form a harmonious, smoothly working whole.

The Long Line organisation is purely functional. It works satisfactorily and successfully, because at no point does the Long Line Division come in direct contact with the public, but in each place deals with one of the associated companies. It handles only long distance or through traffic, and it is properly organised for that purpose.

Recently there has come into this sisterhood of the Bell system the Western Union organisation. It has brought with it some very great problems. It may be asked, and is asked often: Why did the Bell acquire an interest in the Western Union? Was it to suppress competition? No. There was no competition and there can be no competition of consequence between the two, Was it an investment? Not exactly as an investment, because if the Bell had had surplus funds to invest it would perhaps have found something that would have given a quicker and perhaps better return. Then, why was an interest in the Western Union acquired? Simply that in connection with the Bell system, these two great agencies—the telephone and the telegraph—might be made to more fully complement each other in the public interest, and ultimately for the benefit of both companies.

Confronting us all, there are very serious problems as to how the best results are to be obtained in harmonising the various organisations that are involved in carrying out what is really one magnificent undertaking. There are problems of public policy, problems of finance, problems of law, and operating problems of all sorts. I think no one to-day knows just exactly what can and will be done, how far and how fast progress can be made, in welding these two great enterprises into one for the better and further performance of their duty in the public service. But I have no doubt that such progress as can be made, though the difficulties that must be passed are many and serious, will be made, and that the public will be benefited to an extent little dreamed of to-day by any of us.

An ideal organisation, regardless of its form, is one which accomplishes results and satisfies the public. And there is only one thing more that I wish to say on this general topic of organisation. It emphasises the team work idea again. It is this: whatever the form of organisation, because of the intimate touch of our great industry with the lives of the people of all classes, the close relation we have to the homes throughout the whole country, the close relation we have with every little community, it is absolutely essential to our success, whatever the form of organisation in any territory, that wherever the company is known there must be some one person who is looked upon as the company in that place. With a territorial form of organisation you will say that is very easy to arrange. I say confidently that with a functional organisation it is just as easy, if all go about it in the right spirit. There must be no squabbling between departmental heads at any given point. Some one person must be recognised as the senior representative of the company at that point—recognised as the channel through which the public reaches all other branches of the organisation. All ought to pull with the one selected to fill that important and trying *rôle* and not against him.

I have not said a word as yet about a class in our great organisation to which, in a hasty word, I want to call your attention—the girls, who with fine and noble spirit so often carry aloft the Bell banner. Only the other day, when that awful accident happened at Austin, when the dam swept away and the great flood was sweeping down the valley, the telephone operator stuck to her job. She stayed there and saved lives and performed an act of bravery that was as grand and as noble as any man ever performed. Another dam was swept away in Wisconsin within the past week or ten days, and the telephone operators stuck to their positions until the water was three feet deep in the switch-room. One day I was hastily called from my home in New Jersey to Baltimore. The city was aflame. Our St. Paul office was in the very heart of the city and of the great conflagration. The girls sat there deftly switching the traffic that was saving millions of property and many lives, until great firebrands were beating against the windows and the room was full of smoke. No one left her post until the signal was given, and then they marched out in order like a retreating army. Brave hearts! Glorious girls!

Your president very eloquently spoke to you about loyalty to yourself, your job and your company, all of which I heartily endorse; but I want to say that you might go one step farther, if he meant by your company the New England Company. Do not for a minute think I want to lessen the force of the injunction to be loyal to the New England Company, but remember, as members of the New England organisation, that each and every one of you is a part of a great National organisation engaged in the electrical transmission of intelligence.

One step further, if you please: you are engaged in a world-wide enterprise of the highest character. Exchange of ideas simply means civilisation. The electrical transmission of intelligence is a wonderful agency for good. Everywhere it is doing away with prejudices and rapidly making the whole world kin. To-day Tripoli and Tokio are nearer Boston than only a few years ago were Trenton and Ticonderoga. And furthermore, every man who performs well his part, whatever it may be, in this wonderful organisation of ours is helping along the advance of civilisation, is doing an important part in the world's work.

PRESENTATION TO MISS DUGGAN.

IN the Operators' Retiring Room, Dublin, on Dec. 15, Mr. L. G. Allen (Exchange Manager) being in the chair, an opportunity was taken by the traffic staff to present Miss Duggan (Clerk-in-Charge) with a handsome silver tea and coffee service on the occasion of her completing over 30 years' service with the Company, and also as a proof of the high esteem in which she is held by the staff.

The Traffic Manager, Mr. R. Morgan, in a very suitable manner made the presentation, reviewing in brief the changes since Miss Duggan entered the service.

Miss Duggan, in accepting the gift, thanked the staff for their kindness and deeply appreciated the sentiment associated with the gift. Various members of the traffic staff spoke in support of the Traffic Manager's remarks, adding that they hoped Miss Duggan would be with them for a long period to come. Amongst the speakers were Misses E. Boylan, A. Fitzsimon, E. McCann, C. Seery and B. Douglas, and Mr. F. W. Gardner.

TELEPHONY IN JAPAN.

By W. NAPIER.

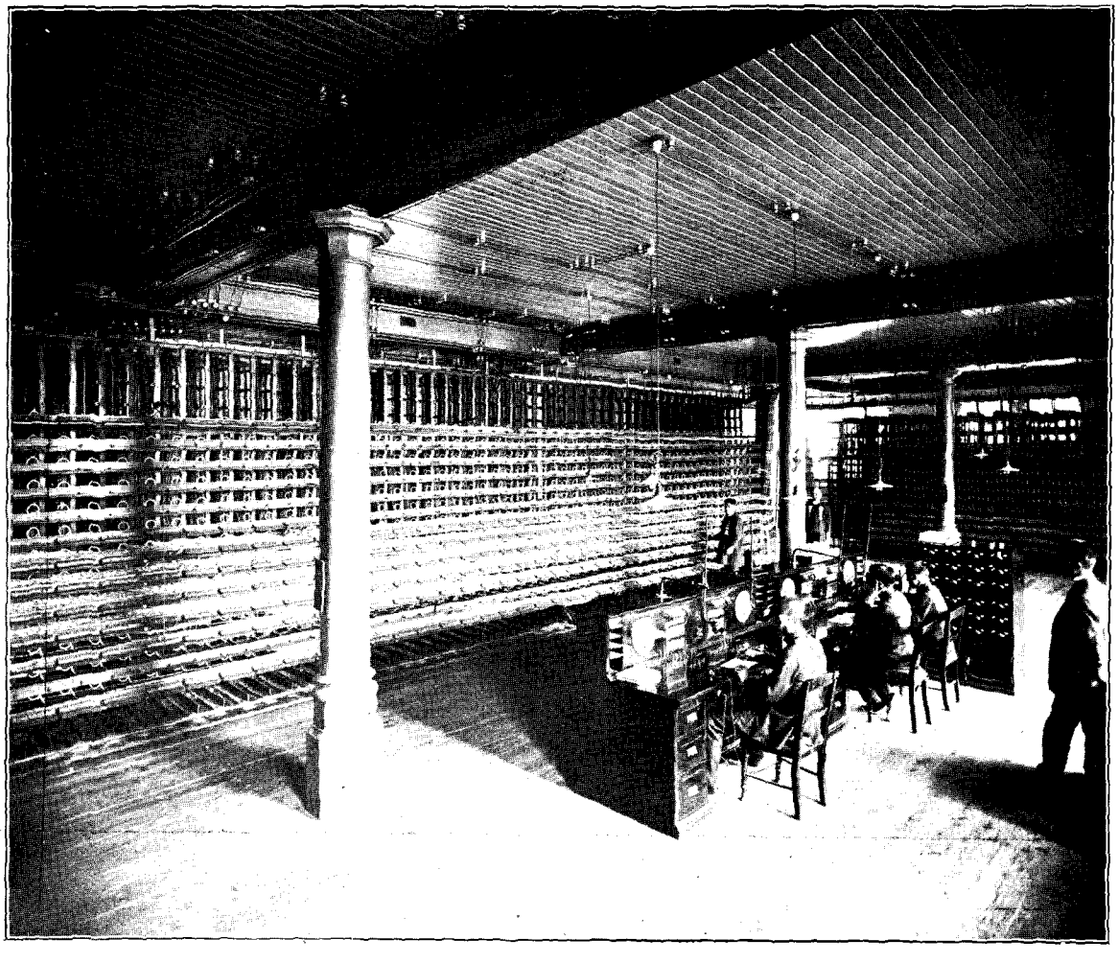


FIG. 3.—APPARATUS ROOM, KIOBASHI EXCHANGE.

IT may be of interest to readers of the JOURNAL to see some further photographs of Japanese exchanges; the accompanying views are of Kiobashi Exchange, Tokyo, which was opened on Dec. 25, 1910.

Fig. 1 shows a view of the building, which, it will be seen, is of an ornate character, and very different from the buildings round it. Fig. 2 shows the switchroom, the switchboard being a Western Electric Company's No. 1 board. The "A" switchboard on the right and the "B" switchboard on the left are parallel, with the monitors' desk in line with the "B" switchboard, instead of the arrangement of switchboard that is more usual in the Company's exchanges.

Fig. 3 shows the wire chief's or test clerk's desk,

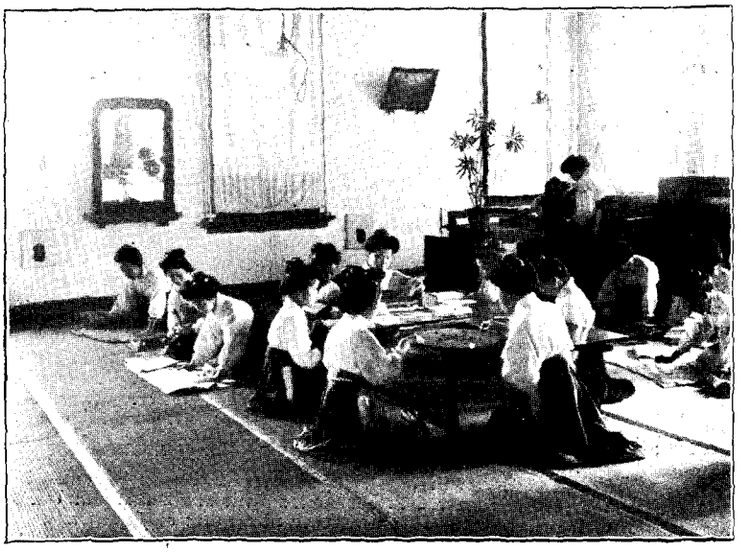


FIG. 4.—OPERATORS' SITTING ROOM, KIOBASHI EXCHANGE.

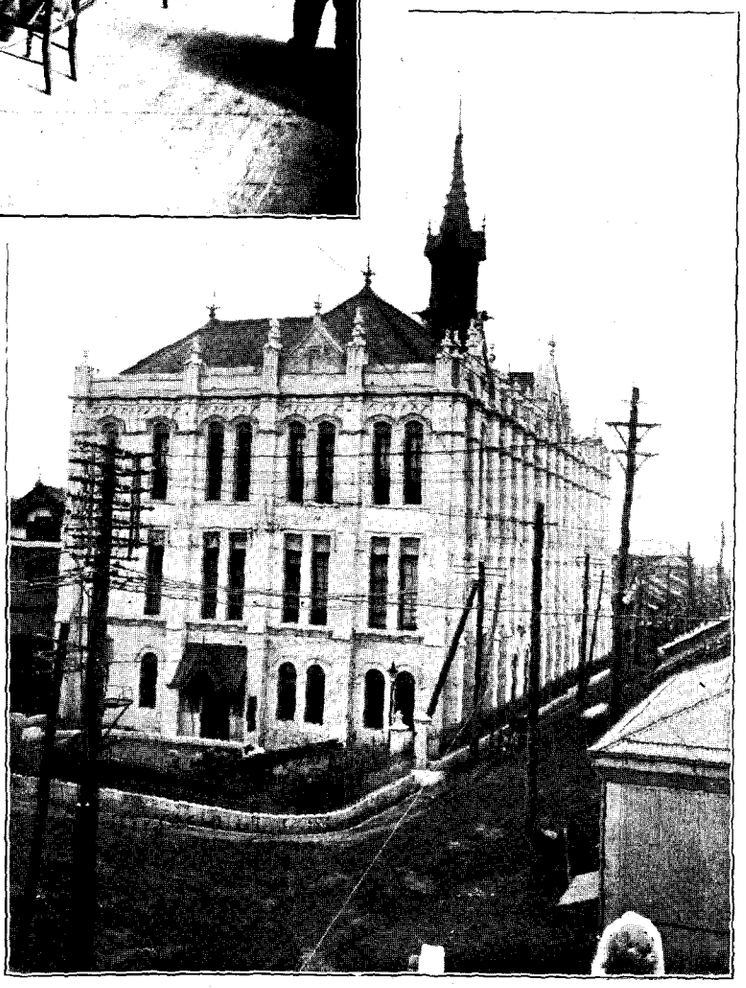


FIG. 1.—KIOBASHI EXCHANGE, TOKIO.

and the main and intermediate distributing frames, and Fig. 4 shows the operators' sitting-room, which presents rather a different appearance to that of the sitting-rooms in this country.

The following are statistics regarding this exchange at July 10, 1911 :—

Number of direct exchange lines ...	2,474
Number of originating calls per line per day	22·4
Ratio of day to busy hour (about) ...	10
Percentage of originating junction calls	80
Number of "A" positions	28
Number of "B" positions	14
Operating staff (day and night)—	
Exchange manager, male	1
Clerks-in-charge, male	2
Senior supervisors, female	3
Supervisors, female	10
Operators, „	144

I am indebted to Mr. Risuke Wakameda, of the Department of Communications, Tokyo, for the above pictures and information.

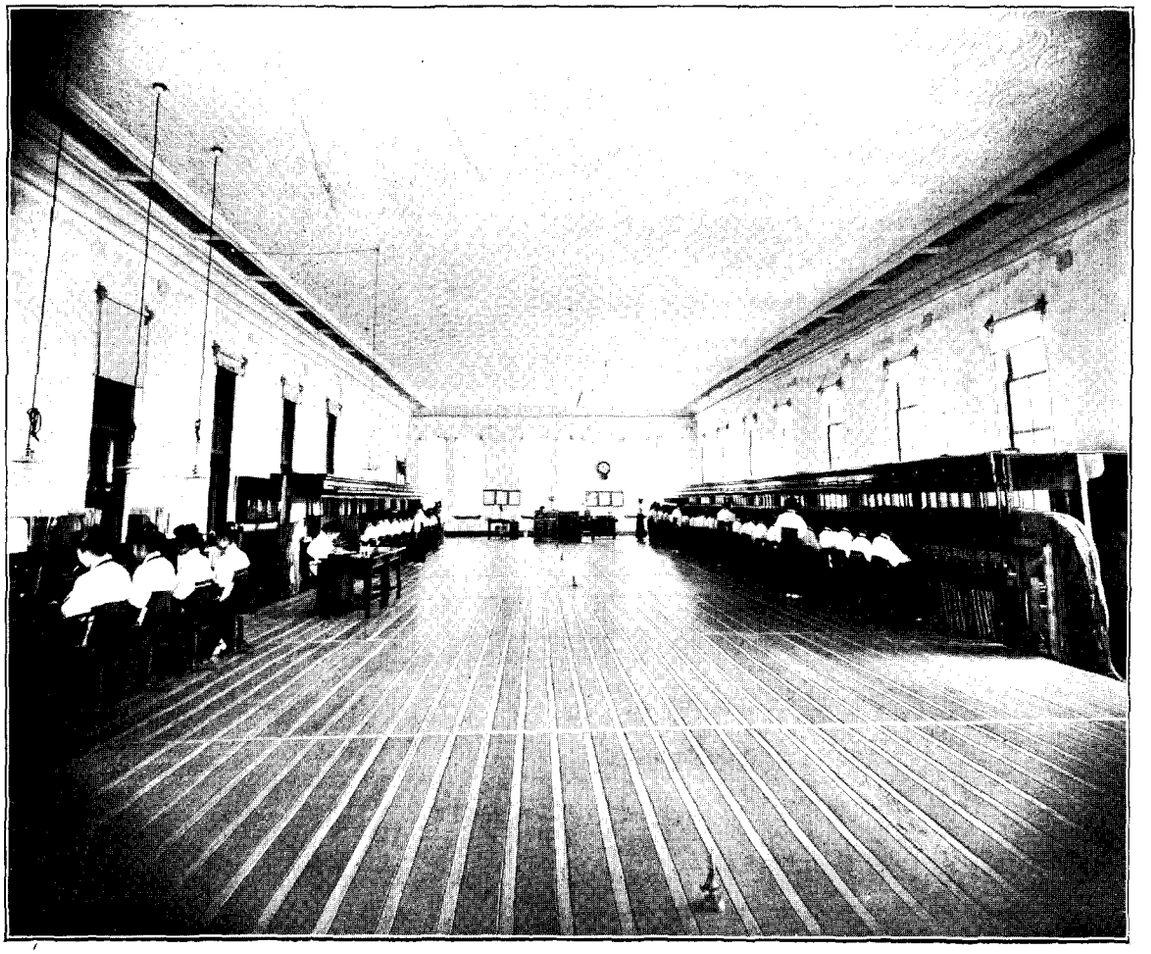


FIG. 2.—SWITCHROOM, KIOBASHI EXCHANGE.

NEW PATENTS.

THIS list is specially compiled for THE NATIONAL TELEPHONE JOURNAL by Messrs. Rayner & Co., registered patent agents, of 37, Chancery Lane, London, from whom all information relating to patents, designs, trade marks, etc., can be obtained gratuitously.

LATEST PATENT APPLICATIONS.

25,216 Gotthilf Ansgarius Betulander. *Connecting means for automatic* telephone systems. Nov. 13.
25,518 Bullers Ltd. and John Whitehouse Jones. Footsteps for telegraph posts or poles and other like posts or poles. Nov. 16.
25,718 Harry Grindell Matthews. Improvements in wireless telephony, applicable also to wireless telegraphy. Nov. 17.
25,965 Sidney George Brown. Telephone systems. Nov. 21.
26,296 James Johnson Webb. Telephone cabinet to ensure privacy of conversation. Nov. 24.
26,464 Walter Pickering and Percy Pickering. Construction of telephone cabinets and the like. Nov. 27.
26,516 Telefon and Telegraphenbau-Ges., G. m. b. H. Telephone instruments. Nov. 27
26,691 Charles Henry Prichard. Telephonic relays. Nov. 29.
26,717 Siemens Bros. & Co. Ltd. Telephone receivers. Nov. 29.
26,735 Erich Borck. Protecting devices for the cords of telephone plugs. Nov. 29.
26,830 Siemens Bros. & Co. Ltd. Circuit systems for operating between manual and automatic telephone exchanges. Nov 30.
27,481 Sydney Joseph Alavoine. Wireless telephony. Dec. 7.
27,568 Francis John Slade Baker. Bracket spindles for use on telegraph, telephone, or other wire supports. Dec. 8.

SPECIFICATIONS PUBLISHED THIS MONTH.

25,243 Wanisch. Automatic telephone systems.
7,852 Siemens Bros. & Co. Automatic or semi-automatic telephone exchange circuits.
26,079 Telephon Apparat Fabrik E. Zwietusch & Co., Ges. Circuit and device for operating selectors in automatic telephone exchanges.
1,110 Aitken, and British Insulated & Helsby Cables, Ltd. Telephone switchboards.
14,590 Steinberger. Telephone and other mouthpieces.
12,898 Dunton. Signalling devices for telephone systems.
14,591 Steinberger. Telephone mouthpieces.
10,045 Graham & Rickets. Impedance coil for telephony and like systems.
13,614 Steinberger. Telephone and other mouthpieces.
13,948 Bann. Telephone receiver holders.
18,462 Siemens Bros. & Co. Mountings for wall telephone sets.

Printed copies of the published specifications can be obtained from Messrs. Rayner & Co., at the nett cost price of 8*d*.

BRAVERY OF TELEPHONE STAFF.

AN interesting event took place on Dec. 7, when two members of the Liverpool building overseer's staff received the award of the Liverpool Shipwreck and Humane Society for acts of conspicuous bravery. The men concerned were G. Hornby and F. J. Gray.

In Hornby's case, it appears that whilst proceeding to his work at midday on Oct. 30 he noticed that a heavy dray horse attached to a lorry had taken fright. Hornby courageously jumped on to the lorry and then on to the horse's back, but was thrown from this position. He, however, succeeded in retaining his hold upon the reins, and eventually pulled the horse up, although he was considerably knocked about in doing so. In its fright the horse had already run over a carter who had endeavoured to intervene.

In the case of F. Gray, when on his way home on the evening of Nov. 26, his attention was called to a fire on the premises 62, Mount Pleasant. Information was given to those outside the premises that two women and a child were in one of the rooms and unable to get out. Gray endeavoured to enter the house, but was driven back by the smoke. He then suggested to some of the bystanders that they should use a coat as a blanket, and by this means the child was successfully rescued. One of the women, however, in attempting the same mode of exit was seriously hurt, as those who were holding the coat were unable to stand the extra strain. The other occupant, seeing this, refused to jump, and Gray commenced to climb a drain spout to rescue her. When about halfway up, however, the woman dropped from the window, knocking Gray in her fall; both were thrown to the ground, but fortunately neither of them was seriously injured.

It may be mentioned that in 1900 Gray also received the silver medal of this society for service rendered in connection with another fire in Oxford Street. For their present actions Hornby received a grant of £2 and a framed vote of thanks and Gray received £1 and a special bar on the medal which is already in his possession.

THE TELEPHONES OF THE WORLD AT THE BEGINNING OF 1911.

By W. H. GUNSTON.

(*Concluded from page* 194.)

III.—ASIA, AFRICA, AMERICA AND AUSTRALASIA.

ASIA.

THE bulk of the telephone stations in Asia are to be found within the Japanese Empire and almost all the rest in the British and Dutch Indies and China.

On March 51 last there were 128,502 subscribers in *Japan*, of whom 27,207 were in Tokyo, 12,132 in Osaka, and 5,951 in Kyoto. In Chosen (*Korea*) there were approximately 6,500, and in Formosa 3,000.

In *India* there were at the beginning of the year 4,377 stations belonging to the Government system and 7,747 to the various companies, or 12,124 in all. Calcutta possessed 4,127 stations and Bombay 2,429.

Dutch East Indies.—At the beginning of 1910 there were 5,463 stations on the State system and 2,381 on private systems. At the normal rate of progress the total for 1911 may be put at 8,800.

In *China* on Jan. 1 there were 1,623 stations in Pekin, and 1 777 at Tientsin. If we add about 5,000 for Hong Kong, Shanghai and other places, the total for China amounts to 8,400.

The figures for Siberia and Central Asia are included with those of the Russian Empire under Europe. There are over 1,000 telephones at Singapore, and about that number in Siam and Cochin China.

Summary.

Japan	128,502
Chosen (Korea)	6,500
Formosa	3,000
India	12,124
Dutch East Indies	8,800
China	8,400
Siam, Cochin China, Singapore, about	2,500

Making a grand total of about 170,000 telephones in Asia.

AFRICA.

The principal telephone systems of Africa are in Egypt, the French Colonies and in South Africa. In *Algeria* there were 5,690 telephones in January, 1911, in *Tunis* about 1,450 and in *Madagascar* about 250. The number of telephones in *Egypt* may be put at 8,000.

As regards *South Africa*, the number of stations operated by the Department of Posts and Telegraphs is 14,744, of which 3,160 are in Johannesburg and 1,611 in Cape Town.

Summary.

Egypt	8,000
Algeria	5,690
Tunis	1,450
South Africa	14,744
Madagascar and other French Colonies, German and Portuguese Colonies ...	1,000
Total	30,900

AMERICA.

The difficulty of getting accurate statistics for America is considerable, which, in view of the high development of the telephone in the Western Hemisphere, is unfortunate. The only State telephone systems in either the north or south continents are those in middle and western Canada. The rest of America is served by private companies, the majority of which publish no statistics, and they are so numerous that it would be an impossible task to collect information from them all. It therefore becomes necessary to supplement the more precise figures referred to in the following paragraphs with estimates based on data gleaned from various sources.

In the *United States* we have a sheet-anchor in the official statistics of the American Telephone and Telegraph Company, and as this corporation controls about one-half of the telephones in the country, these statistics are of considerable value. The number of exchange stations on the "Bell" systems at Jan. 1, 1911, was 4,030,668, as against 3,588,247 in the previous year. For exact figures of the various independent systems we shall have to wait for the quinquennial census of the Department of Commerce in 1913, but as the number of independent stations at each of the last two censuses approximated very closely to the number of Bell stations, it is safe to put the total number of telephones in the United States at, roundly, 8,000,000. As regards the development of the principal towns, all those possessing 10,000 telephones were set out in the first section of my article.

Canada.—The total number of stations operated by the Bell Telephone Company of Canada (serving Ontario and Quebec) is about 130,000, and there are various small independent companies in these provinces. There are 29,748 stations in Manitoba, 5,710 in Saskatchewan and 14,000 in Nova Scotia. Making allowance for British Columbia, Alberta, New Brunswick and Prince Edward, etc., it may be estimated that there were 240,000 telephones in Canada at the beginning of 1911.

Mexico and *West Indies* have about 35,000 stations between them. Official figures are not obtainable.

Summary, North America.

United States	8,000,000
Canada	240,000
Mexico and West Indies	35,000
	8,275,000

South America is the most difficult region of all for which to give telephone statistics. Here, again, there are generally several companies operating in each State; and, in Brazil, one or more in each city. The Argentine Republic has about 40,000 telephones, Brazil about 15,000. Uruguay and Chili each have less than 10,000 stations, and the total for the continent is somewhere about 80,000.

AUSTRALASIA.

Australia.—Here we are again on firm ground and able to give the official figures. The number of stations in the various States of the Commonwealth for the last two years were:

	January, 1910.	January, 1911.
New South Wales ...	31,888	36,631
Victoria	21,112	25,350
Queensland	7,256	9,493
South Australia	6,606	7,410
West Australia	6,514	7,239
Tasmania	2,494	2,737
	75,870	88,860

New Zealand.—The total number of stations has increased from 29,681 in January, 1910, to 33,228 in 1911. The principal towns are Auckland, with 4,458 stations; Wellington, with 4,590; Christchurch, with 3,763; and Dunedin, with 3,484.

Summary, Australasia.

Australia	88,860
New Zealand	33,228
	122,088

Summary, the World.

Europe	2,848,000
Asia	170,000
Africa...	30,900
North America	8,275,000
South America	80,000
Australasia	122,000
	11,526,000

TELEPHONE WOMEN.

CIX.—HELEN CONSTANCE CROWTHER.

MISS CROWTHER is a Birmingham woman, and, in common with most Birmingham people, is very proud of the fact. She entered the Company's service in 1898 at the Central Exchange, Birmingham. She has vivid recollections of her learning days, when she allowed the assistant clerk-in-charge to ring fifteen times,

HELEN CONSTANCE CROWTHER.

and the unhappy period of five minutes she experienced on subsequently being taken to task. Miss Crowther well remembers the removal of the magneto exchange from Bennetts Hill to the present commodious premises at Newhall Street (considered from an architectural point of view the finest in the country) which took place shortly after her entry into the service, and her recollection of the opening is not a happy one. She has, however, seen fit to alter her opinion of "change-overs," having taken part during the past four years in the opening of new common battery exchanges for Central, Midland, Victoria, Edgbaston and East, and to her mind there can be no comparison between the methods adopted in "change-overs" of to-day and the days gone by.

Miss Crowther was appointed to be Supervisor at the Central Exchange in November, 1907, previous to which she had gained some experience as "testing operator." In December, 1908, she was transferred to the East Exchange as Supervisor-in-Charge. This exchange is situated in Aston, the home of the Villa Football Club, and was at one time the busiest of all the exchanges in the Birmingham area, presenting great difficulties in working on account of recent decentralisation.

Miss Crowther's tact and ability have won for her the confidence of the subscribers and the loyalty of her operators.

She is conscientious, painstaking, and never shirks hard work. Her recreation consists of tennis, hockey and rowing, and in the latter sport most men would be glad to equal her prowess.

CX.—RUTH COCKBILL.

MISS COCKBILL commenced her career in the telephone service on Dec. 16, 1898 as junior operator at the Central Exchange, Birmingham.

In those days the only means of training operators was to seat them by the side of an experienced girl and, in Miss Cockbill's own words, leave her to pick up as much of the work as possible. Fortunately for Miss Cockbill, her quickness of hand and eye soon won for her a position at the board. Shortly afterwards she was transferred to operate at the Moseley Exchange, a small sub-exchange about two miles from the Central Exchange. This was subsequently closed and she returned to the Central to look after the subscribers transferred.

In 1906, on account of the growth in the system, the powers that then were decided to decentralise, and again it became necessary to open an exchange at Moseley, and this was done in September, 1906. Miss Cockbill was selected for the Operator-in-Charge. With the exception of a short period when she returned to the central for training, on account of the introduction of C.B. working in the district, Miss Cockbill has remained at Moseley (now altered to South Exchange), and was on Nov. 1, 1907, promoted to be Supervisor in lieu of Operator-in-Charge. Her grade has since been altered to Clerk-in-Charge. Miss Cockbill had seen many changes in the district and has experienced the usual difficulties attendant on the changes of a large system.

Since 1906, in consequence of the development, a number of branch exchanges have been opened to relieve the Central Exchange, two of which have since been converted to common battery working and two are in process of conversion. Miss Cockbill has also seen the opening of a C.B. board for Central Exchange for 2,100 lines and of the Midland for 2,700 lines.

From a comparatively local service with about 11 per cent. of junctions working, the system in Birmingham has now so extended

RUTH COCKBILL.

that the junction working for the district has reached the high figure of 63 per cent. Miss Cockbill has seen the introduction of new methods and the establishment of a school for the training of new operators.

Miss Cockbill's disposition has gained for her many friends and the confidence of the staff and her officers. She is a good all-round sportswoman at tennis, hockey and cricket. The writer has recollections of her successful captainship of a ladies' cricket team on the occasion of one of the annual outings. She is also a good swimmer and fond of walking.

THE COMPANY'S PENSION FUND.

IN our November issue we gave a report of the position of affairs with respect to the Company's pension fund. We are pleased to announce that final arrangements have been made as follows:—

> As soon as the actuaries have announced the division of the fund, which is referred to them under the terms of the trust deed, each contributor to the fund will be informed of the amount which has been allotted to his share. A reasonable time will be allowed in which the contributor may elect whether he will take his share or assign it to the Postmaster-General, but it is desirable that an early decision should be made. If the contributor elects to take his share, it will be paid to him at once by the trustees, and under Section 6 (5) of the Telephone Transfer Act, 1911, his continuous service with the Company prior to the date of his transfer to the Post Office up to a period not exceeding two years will be treated as service with the State. If he elects to assign his share to the Postmaster-General, he will sign a document of transfer and an authority to the trustees of the fund to hand over his share to the Postmaster-General. The trustees will thereupon hand over the contributor's share of the fund to the Postmaster-General, who will give the contributor a certificate acknowledging receipt of the amount of the share and stating the period of service with the Company which is to be treated for the purposes of superannuation allowances as service with the State.

Advice should be sent to Mr. F. E. Sims, Telephone House, Victoria Embankment, London, E.C., of the new address of any member of the pension fund, who after Dec. 31 is tranferred from or leaves his present district from any other cause. The register number of the member should also be given.

THE SILENT CHANGE.

[THERE was much disappointment amongst the more exuberant section of the Press at the poor stage management, so to speak, of the transfer of the telephones from the National Telephone Company to the State. On the morning of Dec. 30, Telephone House was beseiged by reporters eager to assist at the official ceremony of the transfer, which they seemed to think should have at least been marked by a general ringing of telephone bells at midnight and greetings from the Postmaster-General to the public.]

Despairing Press-men weep and tear their hair
  At the deplorable stage-management
(Or lack of it) which let a chance so fair
Slip by unblazoned, without trumpets' blare
  To mark the great event.

Five hundred thousand telephones transferred,
  And heaven knows how many miles of wire
To State control; and not a speech is heard;
No ceremony; ne'er a "wingèd word"!—
  No guns a salvo fire!

On New Year's Eve at stroke of midnight dread
  Should eighteen thousand civil servants spring
New-born, full-panoplied, from SAMUEL'S head
(As Pallas did from Jupiter's, 'tis said)
  And ne'er a tocsin ring?

Alas! Alas! No sense of fitness shown!
  No Minister at midnight in position
To bellow through some mega-multi-phone
To thousands simultaneous, in suave tone;
  "Hallo!" . . . and chance "transmission"!

Is history thus made? Who understands
  The greatness of a change, unless there be
Descriptive columns from the skilful hands
Of those who, in this freest of all lands,
  Guide and instruct the free.

W. H. GUNSTON.

PRESENTATIONS.

PRESENTATION TO MR. ALBERT ANNS.

ON Dec. 21 Mr. Albert Anns, the Secretary, was the recipient of a handsome piece of plate which took the form of a fruit and flower *epergne* and cake stand presented by his principal officers, Messrs. W. Barnett, J. W. Campion, C. W. L. Carter, H. M. Darville, A. Dearle, F. G. A. Kiff, F. E. Sims and C. H. Summers.

Mr. Summers, in making the presentation, remarked that he was sensible of the honour conferred upon him by his colleagues in entrusting him to speak on their behalf on the occasion. Addressing Mr. Anns, he said they had met for the purpose of expressing their sincere appreciation of the cordial relations which had existed between him and his officers for many years. By his unfailing courtesy and kindly consideration, amongst other sterling qualities, he had endeared himself to them, and there was a feeling of depression now that it was realised the time was so near that they must say "good bye." They would have to step into the unknown without his guiding hand, and they would miss him. The *epergne* bore the following inscription:—"*Presented to Albert Anns, Esq., Dec. 31, 1911, as a token of esteem from his eight principal officers who have been associated with him for many years in the service of the National Telephone Company, Limited, on the occasion of their transfer to the State.*"

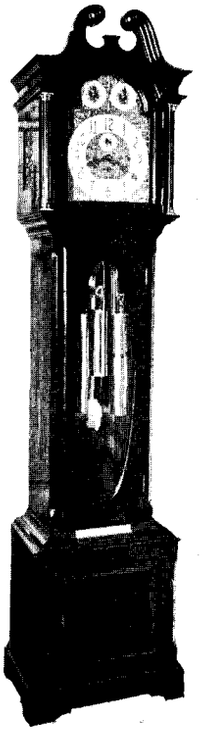
Mr. Anns, in replying, said they had kept their plans very quiet, and he was completely taken by surprise He was deeply impressed by the kindly remarks made with reference to himself, and appreciated the feeling which prompted them to meet on that occasion. It was true that most cordial relations had existed between them, and although he had been nominally their Chief, he looked upon them more as friends. It was, therefore, sad to have to part —but it had to be. There was, however, a bright side, for the memories of the many years of good fellowship would never fade, and he would treasure those memories of which he felt justly proud. No man had ever had a more loyal and devoted staff, and he was sincerely grateful for the great help they had been to him through many years of trouble and difficulty. He wished them every success in the future, and he expressed sincere hopes that when they were more settled in their new positions they would be as happy in the service of the State as they had been in the National Telephone Company.

PRESENTATIONS TO MR. S. J. GODDARD.

ON Jan. 4 Mr. Stanley J. Goddard, the General Superintendent, was presented with a silver cigar box by the members of his staff. Mr. Hare, Assistant General Superintendent, made the presentation, and Mr. Goddard, in thanking the staff, referred very feelingly to the severance which had ensued between himself and men with whom he had been associated (some of them very closely) for periods ranging from eighteen years downwards. He thanked equally those who were well known to him and those newer ones whose connection with him was not so personal, and bade everyone farewell and success in his and her future career.

Previous to this, on Thursday, Dec. 28, another presentation was made to Mr. Goddard of a pearl scarf pin by the Superintendents, Messrs. Chambers, Clay, Coleman, Cowley, Dalzell, Shepherd and Watson, with whom were associated Mr. R. H. Claxton (retired Superintendent) and Mr. E. Hare (Assistant General Superintendent). Mr. J. C. Chambers, in making the presentation, expressed the regret they all felt in severing their relationship with Mr. Goddard, who, he said, always made work seem pleasant. Mr. Goddard spoke with considerable emotion of his heartfelt regret at the parting, and with many warm expressions of his sense of the cordial assistance which he had always received from the superintendents.

PRESENTATION TO MR. FRANK GILL.



ON Dec. 22 Mr. Gill, the Engineer-in-Chief, was presented with a handsome grandfather clock in a mahogany case, which had been subscribed for by members of the staff throughout the country as a token of their esteem and regard for him and as a momento of his long service with the Company. The clock was made and supplied by Sir John Bennett, Ltd., and chimes the Whittington and Westminster chimes on eight and four tubes respectively.

Mr. Cook, in making the presentation said that Mr. Gill both gave and required a high standard of work and he felt sure that every man who had worked under Mr. Gill was the better for it. Everyone knew that Mr. Gill had always had the greatest regard for the welfare of the staff.

Mr. George Franklin, the President, expressed the happiness he felt in being present on that occasion and said that the cordial esteem with which the staff regarded Mr. Gill was shared by himself and the Board of Directors.

Mr. Gill, who was received with great applause, said he found it difficult to know what to say after hearing the previous speeches. He thanked everyone sincerely and felt very deeply the words that had been used. He would like to say how much the Engineering Department owed to the other departments, and he also wished to acknowledge the way in which the Directors had allowed that department to act to the best of its belief. The loyalty of the staff had been beyond praise and he realised more every day the extent to which heads of departments depended on the staff. He commended a high and lofty ideal to the staff bidding them look for truth at all costs and not care which way the results turned out so long as they were true.

The National Telephone Journal.

"*BY THE STAFF FOR THE STAFF.*"

Published Monthly at
TELEPHONE HOUSE, VICTORIA EMBANKMENT, LONDON, E.C.

SPECIAL NOTICES.

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The present double number constitutes the final issue of the JOURNAL.

The Editor is returning the longer unused MSS., and the larger photographic groups to the contributors. Unused notes and the smaller photographs which have been reproduced in the JOURNAL *will be destroyed.*

Binding cases for Volume VI can now be obtained, price 1*s.* 6*d. The volume and year numbers are blank, and orders for binding and lettering complete* (2*s.* 8*d.*) *can be received.*

VOL. VI.] JANUARY, 1912. [No. 70.

1911.

THE year 1911 leaves its distinctive mark in the annals of telephony. Not, indeed, that it has been marked by any epoch-making invention or improvement in the art, or by any extraordinary extension in the telephone system. In fact in the latter connection 1911 has been anything but remarkable for reasons very easily explained. What, however, will make 1911 remarkable to the student of telephone history is that it has seen the extinction of the National Telephone Company and, with it, of private ownership of the telephone exchange system in these islands. On the respective merits of private and State ownership we shall not attempt to decide within the limits of an editorial, beyond remarking that of the larger countries of the world whose telephones are State-owned, Germany alone shows a respectable development and that is far surpassed by the United States, Canada, Copenhagen and Stockholm, all of which owe their high development to privately owned but public-spirited telephone companies.

By the time this, the last, issue of the JOURNAL is in our readers' hands, the National Telephone Company, whose parent body began its pioneer work in 1878, will have ceased operations. We believe it will die regretted. Its faults, which have been blazoned abroad in the past by numerous detractors, will be forgotten, and its solid merits which received the less-read encomiums of a few critics will be recalled. Its history, which the painstaking researches and personal recollections of Mr. ANNS have just placed on record in these columns, shows a long succession of struggles against difficulties of such sort as only a cause deeply involving the public welfare and fought by good fighters could have overcome. Handicapped by absurd restrictions as to area of development, by onerous royalties, by lack of wayleave facilities, by the open antagonism of some public bodies, and the hardly veiled hostility of others, by the unthinking criticism of the Press (especially in past decades), by limited tenure of license and by the caprices of Governmental policy, the Company has developed an experimental device—which was at first looked at askance by the Post Office—into a large and indispensable system of public communication, and built up a telephone network which is the second largest in Europe, being, in fact, surpassed in magnitude in the whole world only by that of the Bell Company of America and by the Government system of Germany.

What limits the National system would have attained to had it possessed some of the powers of a railway or other public company may well furnish matter for speculation either to the future historian or any chance reader of the chronicle we have published. If, without having its eyes for ever fixed on 1911, and without having its energies circumscribed by the necessity of obtaining a return on its capital within a comparatively short period, the Company had always been able to proceed on broad lines, sowing unsparingly even in the less fruitful soil where it could have reaped a harvest at some later date, the development of Great Britain would have compared with any country in the world. For the National Telephone Company has been more public spirited than has generally been supposed. Mr. ANNS has shown how it was the Company and not the Post Office which bore the brunt of the extension of the trunk service to rural places, and an article which we published some time since demonstrated how the policy of opening exchanges in small country towns was pursued by the Company at an early stage of telephonic development when some enterprise was required to open up any but large manufacturing or residential districts. The Company's close study of advanced American practice, its expenditure on scientific research, its encouragement by money prizes of inventions and suggestions (both scientific and commercial) on the part of its staff, its liberal aid to the local telephone societies and its expenditure on the technical education of the staff, compare favourably with that of corporations working under happier auspices. The telephones of this country were working on the metallic circuit system long before that system was general on the Continent—if, indeed, it can be said to be general now—and the same may be said of the common battery principle. It is a notorious fact that every country grumbles at its own telephone service, but it is not too much to say that the service of the National Telephone Company has greatly increased in public estimation during the last decade. The study of traffic problems has been reduced to a fine art, and moreover the public at large are becoming educated to the telephone habit and to a better understanding of the process of making a call. These factors, added to the fuller tuition now given to operators in the operating schools in the largest towns and in the exchanges of the smaller towns, have facilitated the development of an accurate and rapid service.

We think, therefore, that on the whole the verdict of the future historian of social progress in Great Britain will be that the Company has deserved well of the country. It has carried on, under exceptional difficulties, a great national service, and while, of course, as a commercial company it has had to regard the interests of the Shareholders, it has carried on that service with a due regard to the telephonic requirements of the country, and with a high efficiency. If when, in 1880, the telephone was declared to be a telegraph, and within the monopoly of the Postmaster-General, the young Company, daunted, had given up the struggle, what would have been the telephonic fate of the country? Would there now, instead of 700,000, have been many more than 200,000 telephones working in this country? We honestly doubt it!

THE PROVISIONAL CLASSIFICATION.

So many anomalies and hardships of various kinds are disclosed by the classification of the National Telephone staff as issued by the Post Office at the end of December that we are glad to read the assurance of the Postmaster-General that it is provisional and subject to correction. The classification as it stands could hardly have been maintained in view of the promises which have been made that no member of the staff should suffer in connection with the transfer. Its anomalies in many cases are most striking. Some men appear to be classified strictly on salary, so that a clerk is described as second class in cases where another man doing corresponding supervisory duties in the Post Office ranks as first class; others are classified on position or on the nature of the work they are doing. Men in different towns doing the same class of work are graded differently. Some men are placed in a class when already in receipt of salaries far above the maximum pay of that class; some are graded in consonance with a single one of their duties while other duties of equal or greater importance performed by them are ignored; and so forth. Not one of the 18,000, not even the highest, finds a place in the inner ring of the Higher Division. The Department in amalgamating the two systems has adopted neither its own nor the Company's organisation in its entirety, but has altered, adapted and abolished, without apparently having in mind any clear-cut scheme. In fact, one can find no trace of any system of organisation underlying the present classification, and it seems only too apparent that instead of the classification arising out of a well-considered organisation, the organisation will have to fit in as well as may be with the classification. The grading of towns and the men employed therein has been carried out solely in regard to Post Office considerations and cannot be defended from a telephone service point of view. Finally, great lack of consideration appears to have been shown in the nomenclature of some grades. An engineer does not like to be omitted from the class of that name and located among the inspectors, and when a man has reached the dignity of a chief inspector or inspector-in-charge he cannot but regard it as a retrograde step to be classed simply as a skilled workman. It is little likely to stimulate his enthusiasm or ensure the rendering of those peculiar services which cannot be paid for in cash.

The policy of the Company has of late years been in the direction of giving greater consideration to the personality of its staff and taking due cognisance of their responsibilities. Such changes as we refer to above—and the similar de-grading of titles on the clerical and traffic side—are surely steps in a backward direction.

We trust we are not too optimistic in assuming that the object of the circumscribed nature of the present classification is to enable the Department, when it shall have acquainted itself with the work and individual merit of members of the staff: to exercise discrimination as to what men they shall fix within the confines of their class and what men they shall promote as "officers of character and ability" in accordance with Mr. SAMUEL'S recent promise.

We appreciate the difficult nature of the task which the Post Office essayed and sincerely hope that all the unsatisfactory cases which are being reconsidered will be dealt with in the spirit which recent communications from the Postmaster-General breathe. Our hopefulness is, nevertheless, qualified somewhat by the knowledge that the discontent aroused by the classification appears to be every whit as strong in the ranks of former Post Office employees as among those transferred from the Company. In the case of the former it surely cannot be argued that the classification had to be done without adequate knowledge of the staff.

A FAREWELL.

WE regret to inform our readers that with this issue, which will constitute the last of the sixth volume, the career of the JOURNAL closes. The annual contribution made by the Company as part of its educational policy in regard to the staff towards the cost of producing the publication naturally ceases, and the Treasury does not see its way to continue it. There are many features in connection with the JOURNAL upon which the Editing Committee feel that they are entitled to congratulate themselves. Started entirely as a staff paper and appealing primarily only to the staff of the National Telephone Company, the JOURNAL was soon recognised outside as the standard telephonic organ and subscriptions flowed in steadily from all parts of the world. The principal administrative bodies on the Continent of Europe, in the United States and Canada, officials of the Japanese Government, of the Commonwealth of Australia, Dominion of New Zealand and of the various companies operating in Egypt, India and other parts of the East and in South America are amongst our subscribers, whilst to say that the JOURNAL is read by the National Telephone Company's staff is to say that it is read in every place of any sort of importance in the British Isles. Contributions to the JOURNAL have in all cases been honorary (either from members of the staff or ex-members in the service of foreign and colonial companies), and some doubts were expressed as to whether the generally good level of the articles received in the first enthusiasm engendered by the publication of the new staff organ would be maintained and the 44 columns filled monthly. These doubts were never justified. The flow of contributions has been steady, varied and of good average merit, and our difficulty in the last few numbers has been in the direction of finding space for all that we have in type and under consideration.

By reprinting the instructive papers read before American telephone societies, by translating papers from foreign journals, by reprinting the principal prize essays read at the meetings of our own societies, and by calling on specially qualified members of the staff for articles treating of matters within their especial purview, we have endeavoured to keep the staff abreast of the latest movements in telephony. The personal and biographical side and the social side of telephone life have received adequate attention, nor have lighter matters, the humours that arise in all aspects of life, been neglected. Our reward has been in the steadiness with which the JOURNAL has in general maintained itself in favour with its readers and the many expressions of regret we have heard at its demise. The Company, we are glad to be assured, is well satisfied with the result of its generous outlay, and the Editing Committee are happy in the knowledge that they have not laboured in vain. To all our contributors and co-operators we return sincerest thanks, and before closing this article we desire to express our sincere gratitude to Mr. H. LAWS WEBB who gave us valuable assistance during the first years of the publication, and, finally, to Mr. W. H. GUNSTON who since the inception of the JOURNAL has borne all the hard work in connection with its publication, and who for the last four years has practically managed and edited it for the Committee.

ALBERT ANNS,
C. B. CLAY,
FRANK GILL,
STANLEY J. GODDARD. } *Editing Committee.*

COPPER WIRE.

A BRIEF ACCOUNT OF ITS DEVELOPMENT AND MANUFACTURE.

BY F. D. LATIMER, A.M.I.E.E., *Cable Department, Engineer-in-Chief's Office.*

WHEN it was thought that a description of the processes involved in the manufacture of conductors for telephonic purposes would be of interest, the intention was to entitle the article "The Manufacture of Wire." It, however, was soon realised that such a heading would be misleading, for by so doing it would have implied that the whole range of wires of various metals and grades would be dealt with. A very little consideration of the innumerable classes of wire and the multiplicity of uses to which they are put, will suffice to show the magnitude of such an undertaking, for although, broadly speaking, the principles of manufacture are common to all branches, yet a vast store of metallurgical knowledge would be required to do justice to such a subject.

It is proposed to divide this article into two parts:

(1) A *résumé* of the history appertaining to the general developments incidental to the perfecting of copper wire for electrical work.

(2) An outlining of methods adopted to-day in the production of conductors used in the telephone service.

It would be impossible to over-estimate the extent to which the efficient discharge of the responsibilities attaching to the telephone business is assisted by—or more correctly, is dependent upon—all-round excellence in the quality of the media employed in conveying the complex currents. At every point we find its need. The subscriber's apparatus, the equipment at the exchange and the cables connecting them, all require copper, and it must be good copper; while the bare overhead lines of either bronze or hard-drawn copper must also be possessed of high tensile strength and other mechanical virtues combined with correct conductivity.

Some ten years ago a leading London newspaper informed its readers that the engineering authorities of the British Post Office were considering the advisability of replacing their existing overhead copper lines with conductors made of *platinum*, and it may safely be assumed that the statement was duly observed by many supporters of this paper, who, being of a credulous character, noted the probable change with no more than a passing thought. To those of a more enquiring mind it may have appeared incredible that the scheme came within the range of practicability, in view of the fact that copper had a monetary value of some £60 per ton, while the purchase of a single ton of platinum would have necessitated the outlay of approximately £150,000. If these same readers had also the knowledge that platinum possessed a resistance to the passage of electrical currents five and a half times that of copper of equal length and section, their perplexity as to wherein lay the advantage of this drastic alteration would have been greatly increased. To the technical man it was obvious that the allusion to platinum was a "terminological inexactitude." The metal which should have been referred to was aluminium, which at that time had already attracted attention as being, in special cases, suitable for overhead lines. It is immaterial what the auther of the paragraph should have stated. What is more to the point is that, although a decade has elapsed since this announcement was made, neither aluminium nor even platinum has made any real progress towards adoption as an aerial conductor in telegraphic or telephonic engineering, whilst there still continues to exist a big demand for copper or its closely associated alloy—bronze—and the industry connected with the supply of these wires has every indication of great and increasing prosperity.

What the future may bring forth in the more extended employment of aluminium it would be extremely rash to predict, but platinum may safely be relegated to the realms of fancy.

(1) GENERAL DEVELOPMENTS.

While the drawing down of metals to form wire has claims to considerable antiquity, the early history in connection with the application of the art is somewhat obscure. Probably the earlier methods were to forge down the material by hand and then to draw through dies.

The early nineteenth century practice was to roll a strip, and slit it into shreds, which were drawn into separate pieces of wire, and up to about 1850 the coils so obtained were only about 7 lbs. in weight. It was the middle of the century before copper began to be at all extensively employed for practical electrical work, and with the introduction of submarine telegraph cables greater lengths of copper wire were demanded, and recourse was had to copper bolts; but as the mills could not roll smaller than ⅜ inch diameter, and that only in 30 or 40-lb. pieces, the process was costly.

The next step was to improve the slitting method. Previously it had been the custom to pass the strips through flat rolls; and, the bars having been only about 1 cwt., it followed that the slittings were not heavy, but now by confining the strips in "collar" rolls, and also increasing the weight of the bars, it was possible to produce strips of greater length, and coils of wire having a weight of some 50 lbs. were secured at reasonable expense.

While the mechanical methods were being improved it must not be thought that the metallurgical side was neglected. The varying and uncertain degree of conductivity obtained on different batches of copper prompted Dr. A. Matthiessen to investigate the peculiarity, and his researches proved this to be due to the presence of impurities.

Dr. Matthiessen's labours were of incalculable value, and culminated about 1860 when this scientist established a standard of conductivity which to this day is universally accepted.

The practical sequel to the publication of this standard was the inciting of smelters to efforts in the direction of attaining higher conductivity, and with such success that by 1880 the usual run of copper was of some 98 per cent. efficiency. It is recorded that an Atlantic cable laid in 1883 had a percentage conductivity twice as high as the first cable laid in 1856.

By the judicious selecting of the raw material and by improvements in furnace treatment and electro-depositing the conductivity has gradually increased, the eminent firm of Messrs. Thomas Bolton & Sons being the first to guarantee 100 per cent. conductivity of Matthiessen's standard.

Reverting to developments arising from the requirements of the age, we find that about 1884 the telegraph authorities of the British General Post Office directed attention to the utilisation of hard-drawn copper for overhead lines, and the manufacturers were set the task of furnishing a wire having the combined qualifications of considerable tensile strength, durability and high conductivity. Their energies to accomplish this were devoted to such good purpose that hard-drawn copper wire of suitable gauge for telegraphic purposes was produced having a breaking stress of 27 to 30 tons per square inch, and this without any material increase in resistance over ordinary soft copper.

It was at the Oakamoor works of the above-mentioned firm that the experiments and tests were made upon which the Post Office specification for hard-drawn copper was based. The conditions embodied therein have remained in force for those particular sizes ever since, and are generally adopted by purchasers.

The demand for still longer lengths of wire continued, and caused wire rod rolling to be introduced on similar lines to steel and iron practice. The usual weights of bars, now rolled into a continuous length of wire rod, are, say, 130, 170 or even 220 lbs., and in special cases where a long length of a very heavy gauge is required, may reach the exceptional weight of 1,200 lbs.

The introduction of bronze wire for overhead conductors marks another stage in the history of wire manufacture. By means of it, higher tensile strength than hard-drawn copper was secured, and that at a reduced diameter and weight. Naturally these advantages were not gained without some sacrifice, and the conductivity of bronze wire is but about 50 per cent. of copper.

It will thus be realised that as the price per unit weight of copper is nearly equal to that of bronze, the latter is a valuable and economical substitute for the former in cases where high tensile strength is the principal desideratum and the wire in circuit is of such moderate length that the increased resistance can be overlooked.

With a wire possessed of such characteristics available, and the telephone service supplying the necessary situations for its utilisation,

the very considerable employment of this material was but a natural outcome. Additional advantages of bronze are that, being of smaller diameter than hard drawn copper of equal strength, it presents a smaller surface for wind pressure; also its greater indestructibility generally, particularly when erected in atmospheres laden with fumes from chemical or other factories.

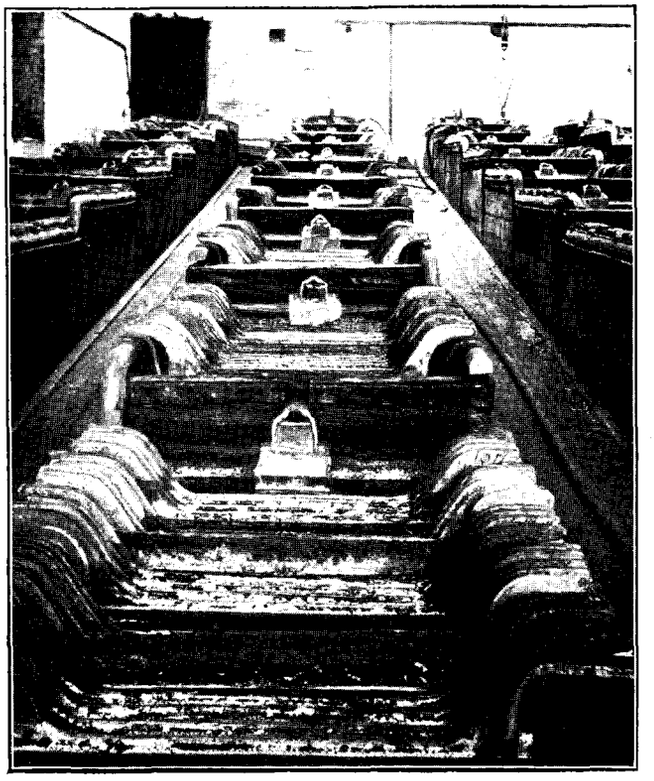


FIG. 1.

The National Telephone Company's standard bronze is that having a weight of 40 lbs. per mile and a diameter of 50 mils, a minimum breaking load of 200 lbs. and a maximum resistance of 45 ohms per mile at 60° F. The annual consumption of such wire amounts to some hundreds of tons. A hard-drawn copper wire to have an approximately equal breaking load as the Company's standard bronze would have a diameter of about 64 mils, and a weight of some 66 lbs. per mile.

The exact composition of bronze is in the nature of a trade secret, but it is no betrayal of confidence to mention that the alloy contains copper to the extent of about 99 per cent.; and we have in this fact a striking illustration of the detrimental effect on conductivity even 1 per cent. of foreign matter is capable of imparting to copper, for bronze, as previously stated, has about 50 per cent. the electrical efficiency of pure copper. One of the earliest makers of bronze wire in this country was the well-known firm of Messrs. Fredk. Smith & Company, of Salford.

The rapid progress made in all branches of applied electricity has been the means of giving a tremendous impetus to the copper wire industry, one of the most notable features being the growth of electric tramway systems and the consequent creation of a market for very large gauge hard-drawn copper trolley wires.

A recent achievement in this respect emanating, from a well-known English firm, is the manufacturing of long lengths of trolley wire in order to dispense with joints, and consists of rolling huge bars of solid copper, some 6 inches square in section with a length of 9 feet or more, and producing from such a billet about half a mile of wire having a diameter of ·4 inch, the absence of joints being greatly appreciated by electric traction engineers.

Grooved trolley wires were first made in America about 1896, and early in the present century found favour in the eyes of some English contractors.

Although having no direct bearing upon the actual production of wire, it is thought desirable as an item of historical interest, that some reference should be made to the action taken by the English manufacturers in order to abolish the unsatisfactory state of affairs which originally existed in regard to the defining of sizes of wire.

In the earlier days, consequent upon the large number of different wire gauges in force, each having its particular adherents; complications, annoyance and disputes were frequently occasioned. This continued until 1884, when—as a result of a memorial addressed to the Board of Trade, supported by most of the leading firms—the "imperial standard wire gauge" was formulated and became law.

The improvement in methods which have been briefly touched upon, coupled with the increased demand, have had the double effect of giving consumers an improved quality accompanied by a reduction in price. In 1880 the average difference between standard copper (or F.O.B. Chili bars which were at that time the standard) and high conductivity wire produced from it, was something like £25 per ton, whereas now it is about half that figure.

In reviewing the growth of the copper wire industry it can safely be asserted that the greatest credit is due to those engaged therein, for undoubtedly they have provided the requisite commodity whereby the engineer has been able to meet and successfully cope with the problems brought about by the necessity for altered modes of constructional work, and also to take the fullest advantage of the more efficient apparatus in every section of electrical engineering.

(2) METHODS OF PRODUCTION.

On account of the intricacies of the various processes employed in the extraction of metallic copper from its ores, it will not be possible to devote much space to this phase in the preparation of the metal for manufacturing purposes. The term "smelting" may be accepted as embracing the whole of the processes referred to, and which consist of a series of heating operations carried out under special conditions. The ultimate object of these heating operations is not necessarily the absolutely complete separation of the copper from the other constituents of the metalliferous substance which has been excavated by the miner, nevertheless the product resulting from the fusion of the ore may be regarded as copper in a fairly advanced state of purity.

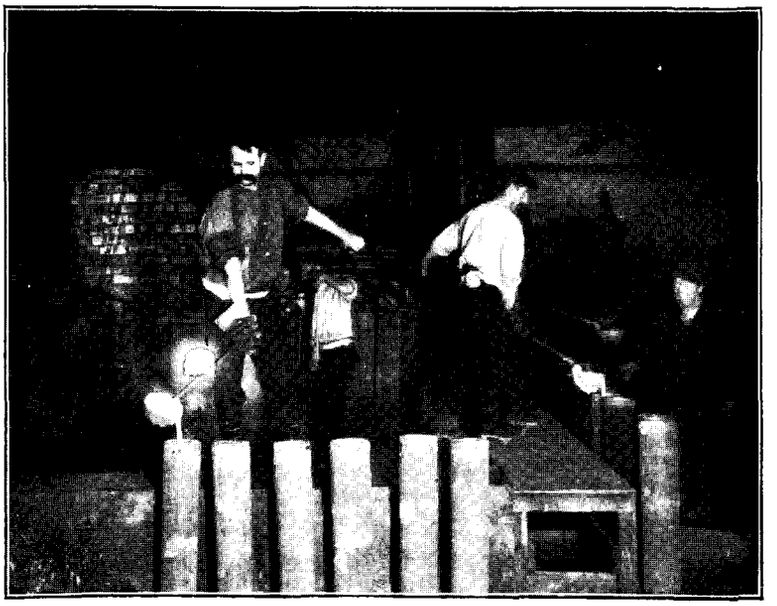


FIG. 2.

Originally the bulk of copper used in this country was imported from the copper-bearing localities of the world in the form of ore, the smelting of which took place principally in Lancashire and the South Wales districts. It was, however, subsequently found to be more economical on account of freightage charges to bring the

copper over in a more purified condition, the necessary treatment for enabling this to be done being carried out in the proximity of the mines, the degree of purity obtained being a variable quantity.

The copper yielded by smelting has next to be electrolytically refined in order to procure a metal of sufficient purity for compliance with the high standard of excellence as regards conductivity which is invariably stipulated for electrical conductors.

The phenomenon of electrolysis permits the production of electrolytically refined copper to be carried out with considerable facility. It will be remembered that if two copper plates are immersed in a solution of copper sulphate, and a continuous current is passed from one plate to the other, the electrode at which the current enters the cell (termed the anode) is dissolved into the solution at the same rate as copper from the liquid becomes deposited on the surface of the electrode at which the current leaves the cell (termed the cathode). The amount of metal deposited in this manner in any given space of time being proportional to the strength of the current flowing through the cell.

In the commercial production of electrically deposited copper, the metal, after smelting, is cast into a block of suitable size to form the anode whilst a thin plate of pure copper constitutes the cathode.

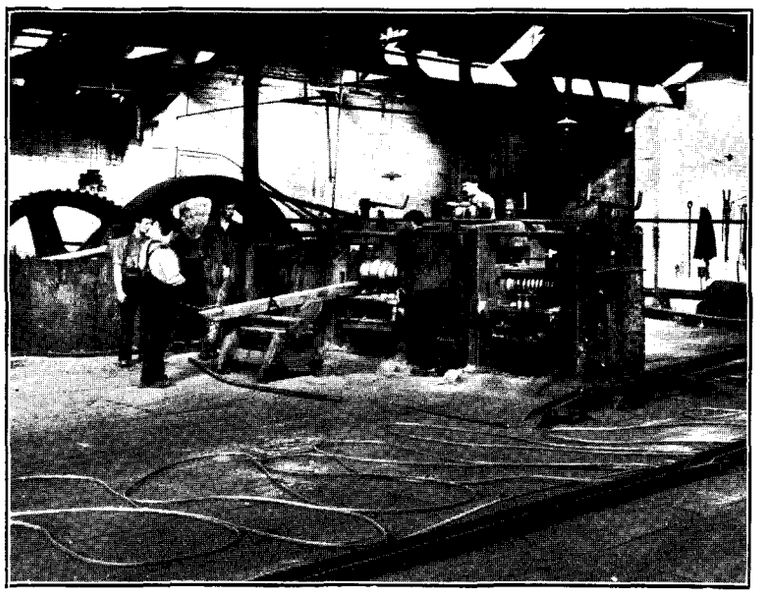


FIG. 3.

The anode and cathode are then suspended in a large electrolytic cell containing a solution of copper sulphate, each individual cell being capable of accommodating a large number of anodes and cathodes alternately arranged. Consequent upon the passage of a strong current through the cell, a heavy layer of pure copper is gradually deposited on the cathode, and the anode becomes correspondingly reduced in bulk. Certain insoluble impurities sink to the bottom of the cell and form a slime which is periodically collected and duly treated for the recovery of gold and silver, the quantities of these metals thus reclaimed being such as to have very substantial monetary values.

The simple experiment of weighing the electrodes of a small electrolytic cell of the character described, after the passage of a current, will demonstrate the slow rate at which copper is deposited on the cathode, and therefore it will be apparent that in order to be in a position to have an output of electrolytically refined copper on anything approaching a large scale, it is necessary that the plant employed should be of considerable magnitude, and must include an electrical installation capable of generating very heavy currents for passing through the cells.

Although the operation of electrical depositing forms part of the treatment of all copper destined for electrical conductors, it must not be thought that the process is practised at every wire manufacturer's works; indeed, the reverse is in reality the case; the majority of wire drawers relying upon independent sources for their supply of metal, no small portion of which emanates from the United States of America. A notable exception is the firm of Messrs. Thos. Bolton & Sons, who, in addition to the wire-making branch of their business, possess extensive electro-refineries at Froghall and Widnes, the combined outputs of which amount to some 750 tons of high conductivity copper per month. The cells at these works are constructed of wood lined with lead, and measure 4 feet in length, 2 feet 6 inches in breadth and 3 feet 5 inches in depth, these dimensions permitting a cathode surface of great area to be presented in each cell for receiving a deposit. The electrical equipment for supplying current for the large number of cells at each of the above-mentioned refineries consists of four dynamos having a total capacity of some 2,000 amperes at 50 volts. A general view of the cells at Froghall is obtainable from Fig. 1.

The cathode, when sufficiently laden with copper, is taken from the cell, and then reduced to a molten state by insertion in a furnace, and it may be here mentioned that copper is a comparatively easily fused metal, its melting point being reached at a temperature of approximately 2,000° F. When thus molten, and in order to assist in the expulsion of any foreign matter which may still remain, long poles of sappy timber are introduced into the liquid, the impurities thereby liberated float to the surface of the copper, and are skimmed off, the matter thus removed being technically known as "slag." The process of "poling" (the term applied to the insertion of timber) lasts for an hour or more, it being continued until certain mechanical tests made on sample pieces indicate the metal to be in a state of "tough-pitch," an essential condition for copper which is to be converted into wire.

The solidification of the copper is next proceeded with, to effect which a number of men, equipped with long-handled ladles, rapidly scoop out the molten metal through a lading-door in the wall of the furnace, and pour it into cast-iron moulds, the billets resulting therefrom usually being about 3 feet in length and $3\frac{1}{2}$ inches by $3\frac{1}{2}$ inches cross section, and about 140 lbs. in weight, although, as previously stated, for special purposes such dimensions and weight are frequently exceeded. In order to prevent the adherence of the metal to the mould, the latter is, before being filled, smeared with a special preparation known as "loam." In Fig. 2 is illustrated the formation of the billets of copper in the manner described.

The actual manufacture of the wire may be said to commence at this stage, and as it is imperative that the metal should be rendered very malleable in order to allow the next operation of rolling to be efficiently performed, the billet is first inserted in a furnace, and the whole mass brought to a bright red heat, a condition which is attained at a temperature of about 1,000° F. By the term "rolling" is meant the subjection of the red-hot billet to what may be described as a series of mangling operations between revolving metallic rollers having peripheral grooves of diminishing depth, and which thus present apertures of gradually decreasing size. The great pressure exerted on the billet in being successively squeezed through these numerous apertures results in it becoming of reduced sectional area, and in consequence considerably elongated.

The process of rolling is one of absorbing interest to the onlooker. To witness the rapid transformation of the stubby billet into an attentuated and writhing rod of hot metal, and to observe the dexterity displayed by the employees in manipulating the tongs to seize the end of the rod as it is extruded from each pair of rollers and whip it round to insert it in the next, is a sight possessing a peculiar fascination, engendered, no doubt, by the apparently dangerous character of the task.

In Fig. 3 is shown a portion of the rolling mill at the Oakamoor Works of Messrs. Thos. Bolton & Sons, the red-hot billet A being seen in the preliminary stages of rolling, whilst in the foreground will be noticed the serpentine rod to which a similar billet has been reduced. Fig. 4 depicts the rolling machinery at Messrs. Fredk. Smith & Company's Works at Salford.

It is not practicable to roll the rod to a smaller diameter than about ·25 inch, and when this point is reached it is trained direct from the final rolls on to a revolving winder and is twisted into the form of a coil. To dissolve the oxide with which the metal has become coated during the rolling process, the coil is immersed in a tank containing diluted sulphuric acid, this method of removing the

oxide being technically described as "pickling." To abolish all traces of acid the coil is subsequently thoroughly cleansed in water.

The rods thus produced by rolling have to be still further reduced in diameter for the purpose of obtaining a wire of the requisite tenuity coinciding with the recognised standard for any particular gauge which may be desired. To accomplish this object, the procedure known as "wire-drawing" is resorted to, and which consists in the application of tractive force to the extremity of the rod, and by this means pulling it—in a cold state—through a sequence of dies, the diameters of which gradually decrease until the correct size is reached; the diminution in the sectional area of the wire resulting from this treatment being again accompanied by an extension in length. The construction of the dies referred to consists in first punching a conical hole through a red hot steel plate, and then when the plate becomes cold, this hole is hammered up and afterwards opened to the requisite size with a steel punch. To rectify any enlargement which may have taken place, it is customary, upon the completion of the drawing of every length of wire to again hammer up the hole while the plate is cold, and re-set it to the original diameter. At frequent intervals it is necessary to re-heat the plate and repeat the procedure, for were this not done the metal would become exhausted and the plate prematurely rendered useless.

In America a quantity of wire is drawn through holes drilled in chilled iron plates, but the surface of the wire so produced lacks the smoothness which is obtained by the use of hammered steel, and for this reason iron dies have but little vogue in England.

Before the wire can be introduced into any die it has to be forged down by hand to have a slightly less diameter for a few inches, when by reason of the taper thus imparted it can easily be inserted, and a sufficient portion of the wire protrudes to enable it to be gripped between the jaws of mechanically controlled pliers. It is by means of these pliers that the initial resistance to the passage of the wire through the die is overcome, subsequently the necessary traction is obtained from a revolving cylindrical drum, to which the wire is secured, and round which it is coiled as it comes through the draw-plates.

Fig. 5 illustrates the foregoing description of drawing, A being the coil of wire about to be reduced in size, the end of which is shown held by the pliers B; C the die plate and D the drum, the mechanism for rotating the latter being situated beneath the bench.

As the drawing operations proceed the physical characteristics of the metal undergo change, the most noticeable being the acquisition of a considerable degree of hardness, whereby greatly increased tensile strength and elasticity is secured, combined with slightly decreased conductivity. If it be attempted to indefinitely continue drawing with the wire in this hardened condition, a fracture would inevitably occur, and therefore to release the molecular tension of the metal it is necessary that at certain intermediate stages it should be softened, or, as it is usually termed, "annealed." To effect this softening, the wire is raised to a state of red heat, and afterwards allowed to slowly cool down, by so doing pliability is regained, and resumption of drawing rendered possible. (See appendix.)

If the wire being manufactured is to be permanently left in a hard state—this being essential for overhead lines or other purposes where high tenacity is of paramount importance—it is considered advisable, in order to ensure conformance with the stringent conditions specified for such wire, that each reduction in size should constitute a separate and distinct operation, the wire after passing through one die being wound into a coil in the manner described before being submitted to further diminution. On the other hand, if the wire is subsequently to be brought to a soft state—such as is necessary for cable making or any other object where flexibility combined with a moderate degree of strength is required—it is customary to institute a system of continuous drawing, the principle of which consists in effecting a number of consecutive reductions simultaneously. To accomplish this, the wire is threaded through the first die, and then after encircling a friction cylinder it is passed through the second die, and so on throughout the whole series until the required gauge is reached. It should be understood that the wire encompasses the friction cylinder after *each* reduction, for it is by this means in conjunction with the revolution of the cylinder, that the tractive force for continuous drawing is applied.

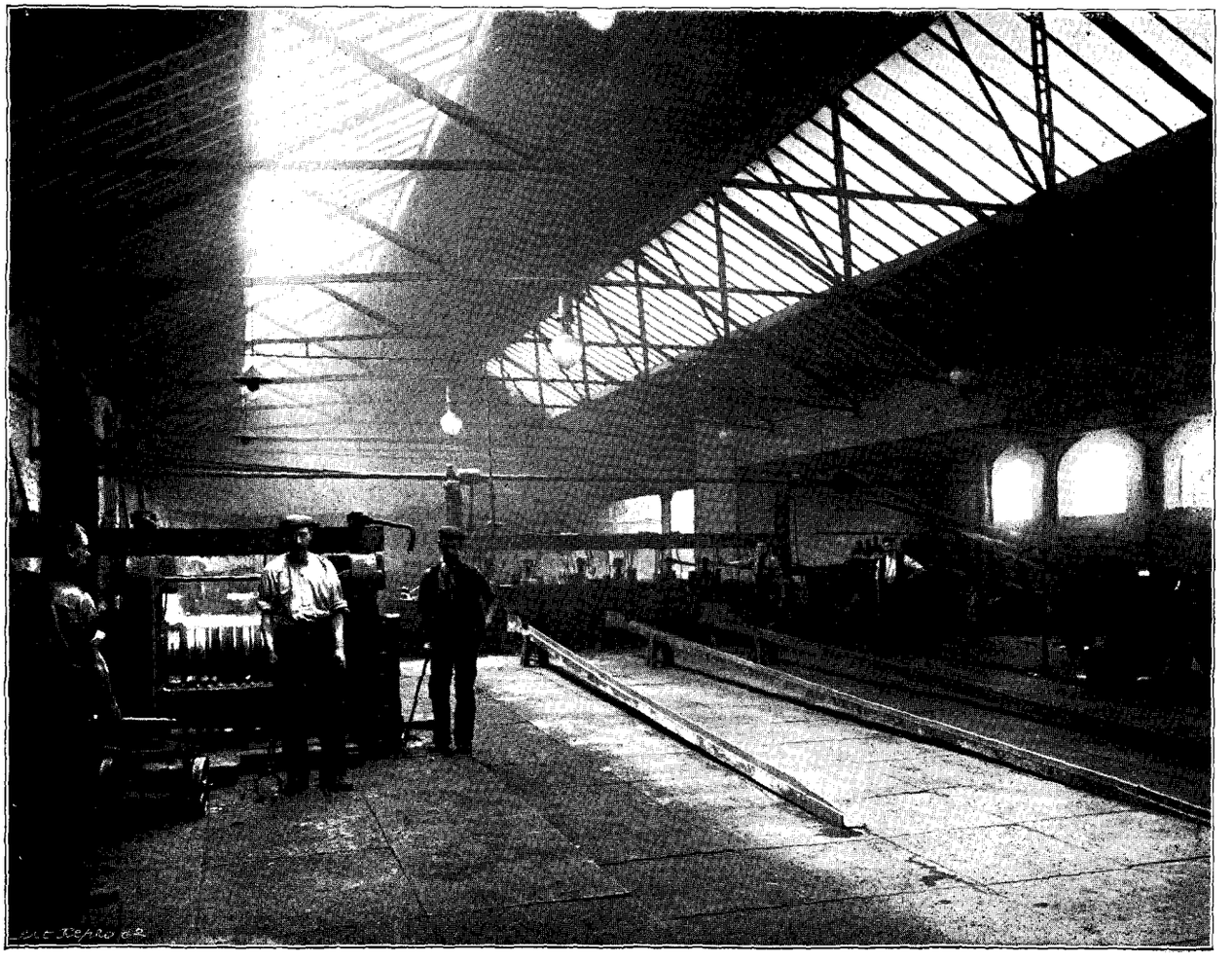


FIG. 4.

A photograph of a typical continuous wire-drawing machine is seen in Fig. 6, A being the coil of wire in course of reduction, C, C_1, C_2, etc., the various die plates, E the friction cylinder and D a

revolving drum for receiving the finished wire; the whole appliance being belt-driven as shown.

In the production of the very fine wires, such as are utilised for instrument winding, it is usual, when a diameter of about ·05 inch has been attained, to discontinue the use of metal dies, the remainder of the reductions being carried out by

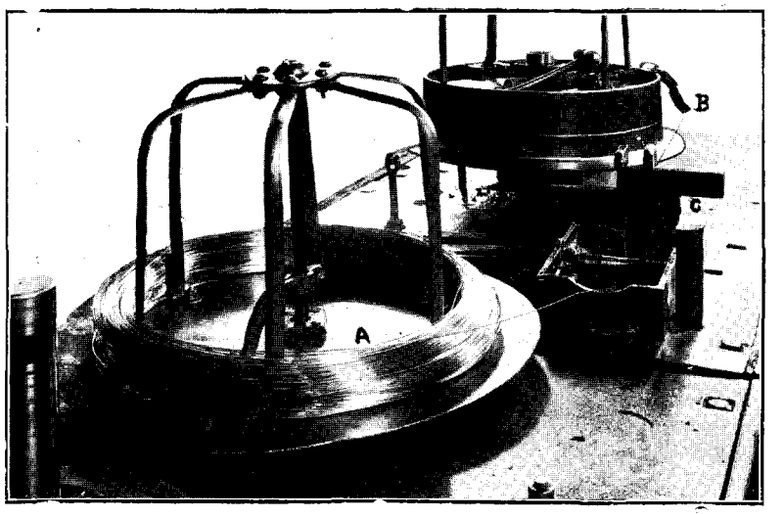


FIG. 5.

continuous drawing through diamonds in which a hole has been bored. The benefits derived from this substitution being, that the extreme hardness possessed by these precious stones, renders the dies less subject to enlargement and assures the retention of a smoother surface.

The passage of the wire through the dies—whether metal or diamond—is greatly facilitated by the employment of a suitable lubricant, and upon the judicious selection of this, the ultimate good appearance of the finished wire very greatly depends. In Fig. 5 will be noticed the bath F containing the lubricant, and in Fig. 6 the pipe F through which a continuous flow of the lubricating liquid is maintained, the object being in each case to keep the wire well greased.

It has been stated that the act of drawing bestows hardness to the copper, and therefore it will be apparent that to procure the softness which is requisite for certain manufacturing purposes (the

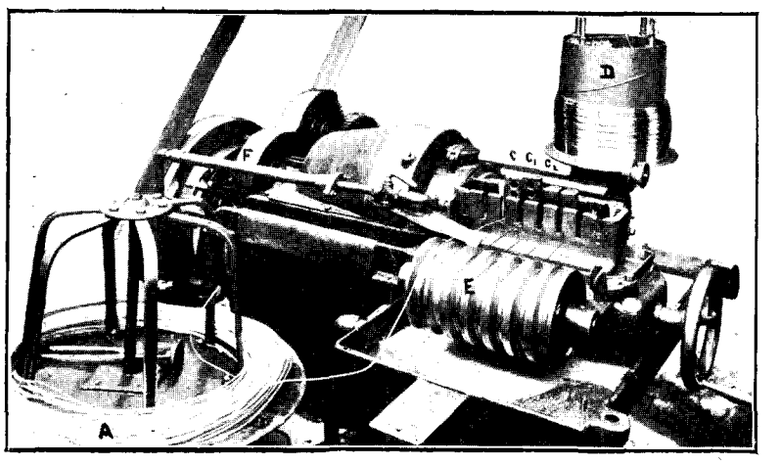


FIG. 6.

nature of which has been referred to), it is necessary that the wire should be re-annealed at the conclusion of the drawing process, and incidentally by the restoration of softness the wire becomes repossessed of the slight loss of conductivity which accompanies the drawing. The modern method of annealing wire in hermetically sealed chambers from which all air has been expelled, results in the preservation of the polished surface which has been secured in drawing. Prior to the introduction of this scheme, the metal was heated whilst in contact with the air and a scale of copper oxide formed on the wire which had to be removed by pickling.

When the wire has to be insulated with vulcanised rubber, it is desirable that it should be given a coating of tin in order to protect the copper from being chemically attacked by the sulphur which is mixed with the rubber. To achieve this, the conductor is drawn through a bath of molten tin, and in consequence thereof a thin film of the metal adheres to the wire.

In the foregoing brief description of the manufacture of the conductors used in telephony, it has been found more convenient to always allude to copper, but it should be realised that bronze is treated in precisely the same manner, when however the latter has to be converted into wire the ingot or billet contains the ingredients of which this alloy is composed.

The writer desires to express his indebtedness to Mr. Thomas Bolton and Mr. Frederick Smith for permission to publish the illustrations, and also to Mr. Michael Bolton and Mr. Joseph Pryor for various items of information of a special nature. (Photographs by Bernard Lowndes, of Cheadle, Staffordshire.)

APPENDIX.

Although the statement that occasional annealing is resorted to in the drawing down of copper wire may be accepted as being generally correct, it is instructive to peruse, the following remarks of Mr. Thos. Bolton in discussing a paper read but a few weeks ago on the "Mechanical Properties of Hard-Drawn Copper.

"The author's account of the transition of copper from the soft to the brittle "state is not quite in accordance with facts. Brittleness does not appear to "occur as a result of drawing *per se*, but as a phenomenon at some stage of "drawing under certain conditions which are not very definitely ascertained. It "is often the case that wire which shows signs of brittleness may be restored to a "tough condition by further drawing in a suitable manner without any annealing. "This seems to be specially the case when the copper contains other substances, "and is very noticeable with some bronzes, but it is to be observed with copper "sufficiently pure to give 100 per cent. conductivity.

"As an illustration of this the following recent test may be interesting. A "piece of wire of 101 per cent. conductivity was prepared in such a manner as "to give a fairly high tensile strength at ·194 inch diameter, and was subsequently "drawn down without annealing, and tested at various gauges with the following "results:—

"Diam. inch.	Tensile. Tons per square inch.	Elong. per cent. in 10 inches.	Wrapping.	Conductivity. Hard standard.
·194	29·0	2·1	6666	101·0
·128	30·39	1·2	66662	100·2
·079	31·36	1·0	66662	98·45
·072	33·32	1·0	666	—
·064	33·28	1·1	6663	—
·048	33·84	1·0	6666	98·31
·028	33·92	1·5	66666	98·1
·018	38·58	2·0	666662	97·6
·015	41·6	2·1	666662	— "

PRESENTATION TO MR. W. W. COOK.

ON Jan. 5 took place the presentation to Mr. W. W. Cook by the staff of the Engineer-in-Chief's Department of a handsome Globe-Wernicke bookcase bearing a plate with the following inscription:—"Presented to W. W. Cook, Assistant Engineer-in-Chief, as a mark of esteem of the Engineer-in-Chief's staff of the National Telephone Company, Limited, on the occasion of the transfer to the State of that Company's undertaking, Dec. 31, 1911." Mr. Gill, in making the presentation, said that his association with Mr. Cook dated from 1891. Since then their friendship had been both business and personal, and he spoke feelingly of Mr. Cook's sound judgment, power of analysis and ability to get to the bottom of matters, and recommended him to the staff, both young and old, as an excellent example. Mr. Cook's experience was varied and covered not only the side of operating, but also experience in other countries and manufacturing experience. Many of the arrangements that made for fairness between the Company and contractors could be traced to Mr. Cook, as also could many concessions to the staff which were prompted by his warm personal feeling for them. Mr. Fletcher, having read the above inscription, spoke of the many acts of kindness Mr. Cook had done and his willingness to give friendly assistance wherever possible. They all wished him all possible success in the future. Mr. Franklin added his testimony of the high regard in which Mr. Cook was held by the Directors and himself, and reiterated the thanks of the Company to the staff for the splendid service they had given. Mr. Cook, in replying, said it was very gratifying to receive such a present under the present circumstances. He was proud to be Assistant Engineer-in-Chief of the National Telephone Company, and should always remember with pleasure the happy relations that had existed between the staff and himself.

THE FOSSORIAL WASP AND LARCH POLES.

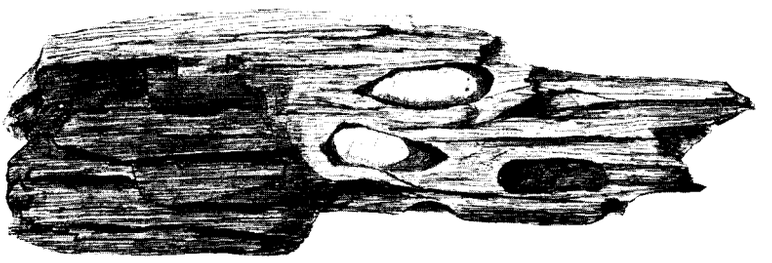
By P. G. HAY, P.A.S.I., A.M.I.E.E. (*Met. Engineer's Office*).

THE accompanying illustration shows a fragment of a larch pole recently recovered in the south-west area of London.

The damage it is believed is due to the operations of a fossorial or boring wasp—genus *Crabro* (sub-genus *cælo crabro*)—which nests in decayed wood.

The outer portion of the pole had commenced to decay and was, in parts, honeycombed by the galleries of this insect. These galleries, approximately circular in section, were filled with the mangled remains of numerous flies of that copper-green tint which is seen on the flies that hover under the shade of forest trees and the powdery timber dust caused by the action of the powerful mandibles of the boring insect. This powder is, apparently, somewhat similar to the excreted dust with which the chestnut telephone pole borer, so prevalent in parts of America, fills the galleries it excavates in unimpregnated chestnut poles.

Whereas, however, the telephone borer would appear to confine its operations to the wind and water line—in some cases



causing the poles to break off—traces of this wasp's activity were found some eight feet above the ground, but its effects are, of course, not nearly so serious.

The usual habit of this wasp, it would seem, is to lay its egg or eggs at the end of the boring it has excavated, and then to fill the galleries with large green flies (*Chrysomzia polita*) upon which the larvæ feed, when the eggs are hatched, until such time as they reach the chrysalis or resting stage.

When the pole was split open one or two flies (a little smaller than the bluebottle) escaped, and it was noticed that the skin on the back above the wing joints was of a particularly bright green hue.

The pupæ shown in the illustration were situated just under the outer layer or skin of the pole, but in each case the "bird" had flown.

The illustration shows the borings and the pupæ with the little hollow chambers in which they rest.

The presence of traces of this insect in larch poles is, of course, not entirely new, but it is probably unusual to find so characteristic a sample of its work and habits, and it may therefore be of some small interest to readers of the JOURNAL.

PRESENTATION TO MR. R. SHEPHERD.

AT the conclusion of a very pleasant and informal lunch given on Dec. 29 by Mr. Robert Shepherd, the Superintendent for the North-Western Province, to Mr. R. H. Claxton, a member of the Company's Lancashire and Cheshire Local Board, Mr. T. A. Prout, the Assistant Provincial Superintendent, and the nine district managers of the North-Western Province, advantage was taken by the staff of the opportunity to present to Mr. Shepherd a splendid quarter-plate "Soho" reflex camera, fitted with a 6½-inch "Ross" homocentric lens and all the latest and best contrivances. The presentation was made on behalf of the staff by Mr. T. A. Prout, and testimonies of the very high esteem and sincere affection entertained for Mr. Shepherd throughout the Province were spontaneously borne by each of the district managers in turn, and these sentiments were also warmly endorsed by Mr. Claxton, Mr. Shepherd's predecessor as Superintendent of the Province. Mr. Shepherd being already an expert photographer, the form the presentation took gave him special gratification and in thanking the staff he gave very eloquent expression to his feelings on taking his farewell of the Company's North-Western Province.

THE COMMERCIAL MIND.

By EUSTACE HARE.

(*Concluded from page* 197.)

THERE are few words in our language, or its equivalent in any other language, that bears a broader meaning than the word "necessity." What is, or has, become a necessity to one man may in the eyes of another be deemed a luxury. Everyone knows that, as we are constituted, light is a necessary of life, but there was probably a time when artificial light for ordinary purposes was unknown, and until it became general it could not be counted a necessity. Perhaps the most notable fact resulting from the introduction of every new and important invention is the extraordinary influence it bears on the manners and customs of the people; and yet, be it remarked, the new thing almost invariably precedes the public demand for it. Is it not, for instance, an astonishing fact that although Queen Boadicea rode to battle in a wheeled chariot, coaches were unknown in the time of Queen Elizabeth; and apparently no one was conscious of the want of them! But with their introduction, and with their later development into steam traction, the old order changed, distance became an everyday affair, and vehicular traffic a necessity. That is to say, it became necessary to the altered times which itself had brought about; and therefore we must apply the term to the age in which we live, and not comparatively to a bygone era. There are few inventions which have brought about such a change of manners and custom as the telephone, and thus, to those who live in the present, it has passed the stage of a luxury and become a necessity.

There can be little doubt that the man who invented the first coach possessed in addition to his inventive genius the commercial mind, because he must have foreseen the enormous benefit the public would derive from his work, though not perhaps its full possibilities. But all inventors do not possess this advantage, and can view the creations of their brain as inventions and nothing else; some, a very few, are in advance of their time, some lag behind and very many waste it in trivial, abortive work. In any case, the commercial mind must be brought to bear on each new thing for its exploitation and management, the whole secret of which lies in the selection and distribution of labour. And it is chiefly when labour is faulty that troubles arise.

We are therefore brought to this point, that the success of every venture which involves the appreciation of the public depends not so much on the intrinsic worth of the new thing as on the skilful management of its launching. That is to say, the general direction must be under the guidance of a commercial mind, a mind that has been trained among men rather than among the things which man wants. But I do not for a moment desire to suggest that a man who has specialised in a particular profession or calling thereby unfits himself for general control; nothing so absurd is in my mind. There is no reason why an engineer or a lawyer should not direct a commercial concern as efficiently as a man who has limited himself to a purely commercial training; but what I do mean to say is that a special technical training does not lend itself to gauging the wants, views or foibles of the public or to watching the labour markets, or to developing the purely commercial spirit.

For this reason: the commercial man has to deal with a world in its normal, bread-and-butter state, in its every day garb, with a public which is familiar with the simplicity of the bankers' scoop and scales, but is suspicious and shy of the cold precision which characterises the trained reasoning of the specialised and technical mind. It is the commercial hand which guides the world in its daily quest for the means of subsistence and for the conveniences and superfluities of life; to do which it keeps in touch with current and coming events, in order that matters may so be managed that fluctuations in markets, the introduction of new fashions and ideas and consequent changes in customs cause as little derangement as possible in the existing conditions of the nation's domestic life nor unduly disturb the even flow of daily business.

Now, the atmospheres of the engineer and lawyer are abnormal and, to my mind, this is the great distinction between those professions and the commercial. The case of the lawyer is the more obvious of the two because everyone knows that it is only in

unusual circumstances that his aid is requisitioned; at least, so far as the generality of mankind is concerned. With regard to the engineer the position is not quite so clear, but I think you will understand what I mean. The real mission of the engineer, using the word in its technical sense, is to provide new machinery or to build something which did not exist before, and everything which is new, in the sense of being novel, is abnormal; as soon as it becomes normal it becomes mechanical and commercial, and the engineer turns his attention to new fields of improvement and invention. It is true that the question of cost enters largely into his calculations, but this is incidental. Cost must be subservient to such things as strength, durability and efficiency; but to overload machinery merely to make assured strength doubly sure is, I take it, bad engineering; and it is not a commercial question at all. Whether, on the other hand, it is judicious to introduce a new or improved thing, the necessary cost of which augurs financial failure, is not an engineer's question but a purely commercial one. You will now see, I think, that the bent of the technical and legal minds does not lend itself to deal successfully with the everyday concerns of ordinary business life.

It is clear that the commercial man must be a thinker. This may sound a platitude, because no man who does not think can hope to achieve any measure of success in any calling whatsoever. Quite true; but how many of us on the commercial side of our business can claim to be students of Thought? By which I do not mean its mere application to the care and concentration necessary to the use of our tools—*i.e.*, to accuracy of detail or a knowledge of bookkeeping or neat penmanship, but to an intelligent and reasoned consideration of the final object of our work, of the outcome of it to that public which we as part of a commercial concern with a commercial object set out to serve. What is the position of this telephone service in the existing order of things: is it achieving its possibilities, and taking an adequate place among the other great national services of the day; and if not, why not?

These are some of the questions which should engage our commercial attention if we look forward to assume higher responsibilities in the future.

But a thinking mind is useless without material to feed upon, and such material can only be gained by observation; it is not self-created. The cultivation and practice of general observation is another essential for a successful commercial career. The commercial man lives in and lives for current events; he has to watch the wants and signs of the times, passing customs and the swing of the pendulum. He has no time to pause and consider what he can do for posterity. This is work for other brains and hands. It is for him to decide whether the moment is ripe for a change, whether the people are prepared to accept the new thing, whether the cost of it is commensurate with its utility, and whether it is in the range of his ability to cope with the prejudices to which many new things give rise.

All this requires experience, to gain which he must pass through a long apprenticeship, much of which is both arduous and monotonous, but which is insensibly fitting him for the wide circles of enterprise and responsibility. Experience begets self-confidence, without which he will fail in responsibility, while self-confidence leads to the acme of commercial attainments—viz., the faculty of arriving at rapid decisions and of acting on the spur of the moment. For be it noted that while the engineer and lawyer can consult authorities, rules and precedents, the man of commerce has continually to rely on his own unaided judgment. He is dealing with everyday events which admit of no delay and must be cleared up with the day's work, whereas the larger matters which usually claim the attention of the specialist allow of and demand careful and protracted consideration according to the magnitude of the interests involved. Thus you will observe another fundamental difference between the training and qualifications of these three callings. One of them, the commercial, is free to decide a point on the mere grounds of expediency or on what seems to him a fair basis under existing circumstances, whereas the training of the other two is entirely antagonistic to the forming of anything that savours of a hasty conclusion. In fact, you have only to refer a subject to the professional or technical mind and you may safely predict a certain amount of, no doubt necessary, delay.

Let me give you an illustration of two methods of reasoning. A lawyer in arriving at a decision as to the intention of a compact clears his mind of everything that has happened since it was originally propounded, of everything that was not actually foreseen or provided for at the time it was entered into. In other words, he deals with facts as they were then and not as they are now, and in the interpretation of the letter of the agreement he pronounces his opinion. The commercial mind, on the contrary, usually reasons, and is free to reason, from a different standpoint. Its training induces flexibility, and as it is of the very essence of his calling to move with the times, he is influenced by the altered conditions, and in a spirit of give and take, which is strictly compatible with business affairs, is prepared to take a broad view of the situation. Nevertheless, he weighs well the pros and cons to avoid, undue leniency on the one hand and too grasping an attitude on the other, and the habit of systematically arriving at a fair and sensible medium can only be attained by long practice combined with natural acumen.

Those of you whose present duties mainly consist in the keeping of books and accounts, are perhaps wondering in what way all this affects yourselves personally, or at what stage of your careers you can possibly be summoned to exercise the functions and qualifications I have touched upon. All I can say is this: by choice or by force of circumstances you have embarked upon a calling which is as important and should be as engrossing as any other, and, as in work of all kinds, the more you know of and appreciate the higher walks of it, the more interesting does everything appertaining to it become. Further, I would put this practical question. What is your ultimate goal, and to what height does your ambition soar? If you are content to aspire to nothing more than accuracy of workmanship and to fulfil diligently the task immediately allotted you, then I agree that practice combined with the skilful use of your tools will furnish you with all that is needful. But you must be content to remain in the ranks, nor complain others of a wider range of vision and greater fixity of purpose pass over your heads. You are admittedly labouring under this disadvantage, that commercial training and development are so wide that it is extremely difficult to know where to begin; but I would suggest that nothing broadens the mind so much as extensive reading, and in these days of libraries and competent librarians it should not be difficult to find for study appropriate works by the many great men who have written on commercial subjects.

I have already expressed the view that the head of every business concern should possess primarily the commercial mind, and it follows that those whose training and experience lay in a commercial channel should be best fitted for such a post when opportunity arises. Therefore I will assume, for the sake of argument, that the aim of every individual who passes through our commercial offices is to become eventually a district manager.

Management means not only the management of labour, but of the output which labour produces; that is to say, it involves something more than the control of a staff—because this falls to the lot of every one called upon to perform supervisory duties—it means also the value of the article produced to the public from whom the even flow of money—the oil for the machinery—is derived. If the supply of money in any particular quarter fails, there is some cause for it, and the cause has to be found. These and many other subjects fall within the manager's purview, and it is clear that a knowledge of them cannot be acquired by the mere acquaintance with the detail of the commercial machinery. The time for detail is past, and the man who attempts to keep his hold on detail will fail in the broader boundary of management. At the same time, even as an engineer would not attempt to build a locomotive without a knowledge of its fractional parts, so a commercial manager will find himself handicapped unless he too has passed through the mill.

But I must add a further qualification for managership. A man who has acquired the habit of training his mind to anything, who has specialised for any profession whatsoever, no matter what that profession may be, is infinitely better fitted to take up the commercial reins than he who has never trained his mind at all. Granted, of course, that he is prepared to educate himself afresh in the particular business he is called upon to govern; and this brings us to a new point. It is not enough for a commercial man to make himself acquainted with the purely commercial side of his business; he must have some practical knowledge, the more intimate the

better, of the work for which he is made responsible as a whole. In all private concerns, whether those of colliery owners, hat manufacturers, or wine merchants, the head of the firm learns something of the business from top to bottom; and if he wishes to succeed keeps abreast with the times, and what holds good here should hold good in a public service.

I am now going to strike a note of warning to our commercial staff, to which I have been leading up. There is, I believe, at the present day a growing tendency to appoint technical and professional men as managers of commercial undertakings and public services—men who are, say, engineers and lawyers first and commercial men afterwards. In my view, and no doubt in the view of many others whose ways lie in the commercial path, the system is quite wrong, and I can only imagine that the explanation lies in the fact that the competent commercial man is not forthcoming. My reason for thinking it a reversal of the natural order of things is this: take, for example, the case of a railway company. The motive and object of a railway company is not to manufacture locomotives, but to provide the travelling public with an adequate and efficient service and to meet its everyday wants, and it is the ever-changing wants of the public which demand the first consideration. To do this the public must be studied, not only in connection with the exigencies of railway technique, nor the manner in which the best engineering results are attained, but in the light of current events and in anticipation of new facilities which the requirements of the age demand. These are matters for the consideration of the watchful, observant commercial mind, and do not form part of an engineer's curriculum; and it is not to be expected that he will in a moment throw his previous training to the wind and view matters from an altogether different standpoint, unless of course he finds, somewhat belatedly, that he has mistaken his vocation.

As a concrete illustration of what I mean let us suppose we have in contemplation the opening up of a new neighbourhood for telephonic purposes. Not being an engineer I cannot say for certain how he would proceed, but I should surmise that his training would lead him to set about it somewhat on these lines (leaving out of the question all such technical matters as the planning of routes, methods of construction, etc.). Taking into account the number and class of houses or inhabitants in the area, he would reckon, on past experience, what percentage would require to be telephoned; and as regards the rate of increase, he would probably examine statistics and curves showing what the rate has been over a period of years; and there I think he would stop. But this, from the commercial point of view, is only part of the business and not the most important part of it; it is after all, a purely rule-of-thumb method. The commercial mind would want to know what particular trade, if any, the inhabitants followed; was the trade on the crest or eve of a boom, or was it passing through a stage of depression, and therefore is it a time for sinking money at all? Again, it is unsafe in laying out new capital to base your calculations on mere curves of past increases without studying the conditions under which that increase was obtained. Besides external influences, a change of rates either way might have for a year or two the effect of upsetting altogether the knowledge of past experience. Another factor is the general state of the money market. It sounds anomalous, but it is a fact that when money is plentiful commodities are dear, and when commodities are dear a service like ours suffers. You will understand this broadly when you consider that when anything is plentiful it becomes cheap, and money is no exception. The more money the public has to invest the less interest they can get for it, and this therefore is a halcyon time for the borrower. The manufacturer takes advantage of it, and extends his business, and the extension of business means the employment of superfluous labour. Labour therefore becomes scarce and consequently dear, until at last the production of labour becomes dear also. Thus the public finds the cost of living advances and is forced to deny itself luxuries and superfluities, and it is needless for me to point out that those who have not acquired the telephone habit are not likely to do so when they find it difficult to provide themselves with bare necessaries.

On examination it would probably be found that more new business has been secured when money has been said to be scarce then when it is plentiful, but that high-water mark has been reached during the short period in which the increased influx of gold is circulating, and before it has had time to affect the labour and money markets. These and many other similar subjects are all food for the commercial mind.

But if members of our commercial staff desire to achieve full success it is most desirable that they should also learn something of the technical side of our business. Full facilities in this respect have been afforded us in the past, but few of us have I fear availed ourselves of them. Moreover I feel constrained to say that in preparing themselves for future work and responsibilities our clerical department as a whole falls short of what is done in this respect by those of our colleagues who are engaged in actually providing the telephone service.

A straw will show which way the wind is blowing. As one on the commercial side I was disappointed to learn recently what a very meagre support has been given to THE TELEPHONE JOURNAL by the clerical staff generally. The reason for it cannot assuredly be found in the cost, and the only other explanation can be, that the contents have not been sufficiently attractive; that the progress of our science, the recorded efforts of our colleagues in its field and the cosmopolitan news published for our marking, appeal so little to us, that the vast majority of us do not think it worth while to discover whether we cannot now and then find something in it that it behoves us to know. If another reaon is to be found in the fact that most of the articles in it are of the technical rather than the commercial order, whose fault is it? The Editing Committee would doubtless have welcomed any commercial or clerical contribution that merited publication; whereas it would seem that either there is no demand for such subjects or that the springs of commercial knowledge have dried up. If this be so, the present-day position of the clerk is deadly.

But this is not the case. Commercial subjects are as plentiful as those of any other field of activity, but they require seeking, and infinite thought when found. Many of the commercial articles and papers I have read and heard delivered are sadly lacking in originality, and though they as a rule show a grasp of the subject, it is somewhat rare to find the subjects presented in a new aspect, and this is a great help in the matters of interest and instruction.

May I throw out a suggestion or two. A stores clerk notices that the latest consignment of copper wire or poles varies considerably in price from the previous supply, but does he ever pause to enquire the reason for these fluctuations and to find out the commercial causes and then endeavour to sift them to the bottom? I can imagine a paper giving the results of his investigations being listened to with intense interest. And what about the author himself? In exploring new ground, he is gaining knowledge; every bit of which increases his commercial value.

Or, take the cashier. To how many cashiers does money represent anything more than so much coin to be accounted for and paid into the bank or paid out in exchange for labour or goods? Does it occur to him that money is a science in itself, that what he receives of it this month may not have the same purchasing power next month, and if it has not, what is the reason! The theory of money has as wide a range as any subject you can think of, and it is one that appeals to most of us.

One more example. Our contract departments have been much to the fore during the last five and six years, and in addition to monthly official reports, which are always useful and interesting reading, I have read several articles on methods of working or dealing with what may be called the lighter side of the art of canvassing. But I do not remember to have heard or seen the subject dealt with in its highest or broadest aspect. What influence has good or bad trade had on our business as a whole? Do our contract managers by watching the signs of the times foresee the swing of the pendulum, and if so, how have they arrived at their conclusions? Do the periods of prosperity and the reverse occur with any degree of regularity, and under what conditions are the efforts of their staffs most successful? It seems to me that a *resumé* on these lines would be not only interesting but extremely valuable to the administration generally.

What I want to emphasise is this. Unless we of the commercial side of this business dive and delve into the theories and inner meaning of our work we debase our calling and degenerate into machines. If we are content to learn what is going on around

us by accepting the clippings of a cheap press instead of forming our own opinions for ourselves, our capabilities are rusting by disuse. The commercial mind is a capacious net, but what we draw into it demands scrutiny and considerable sifting. The great difference between our calling and that of such men as inventors, poets and painters, is that we have to tread the shifting sands of current and passing events, whereas their work stands, or should stand, for all time. The familiar things of daily happening are "extras" to them, but to us they are the very essence of our work, Thus we have to conform to, and provide for, the needs of the hour. and this demands the full attention and experience of an observant mind, ever on the alert.

DAILY ORIGINATING TRAFFIC, BRISTOL EXCHANGE; ITS VALUE, OPERATING DUTIES AND THEIR ARRANGEMENT.*

By A. E. Coombs, *Traffic Manager, Bristol.*

(*Concluded from page* 199.)

Proportions of Main Classes of Calls.

The proportions of the originating calls on the various services at Bristol Exchange are given below. These figures are representative of the busy hour load. With such an involved question as this we cannot detail each hour, for the problem would be never ending; so, inasmuch as we base all our calculations upon the busy hour, it was thought a similar principle should apply in this case.

Busy hours.	Unvalued.	Valued.
(1) Flat rate calls at a valuation of 1...	3,044	3,044
(2) Measured, message and residential calls at a valuation of 1·1 ...	1,578	1,736
(3) Ten-party line and two-party line measured rate calls at a valuation of 1·75	177	310
(4) Call office money box calls at a valuation of 2	216	432
(5) Measured rate money box calls at a valuation of 2·25	206	463
Total	5,221	5,985

Dividing the total of the unvalued column (5,221) into the total of the valued (5,985) we get a dividend of 1·15. This figure (1·15) therefore represents the *average* value of each originating call.

The curve outlined (Fig. 1) will show in graphic form the number of calls on each of these five main classes of service an operator is assumed to be capable of efficiently dealing with in the busy (or any other) hour.

Take the call office call curve marked D, and, reading the line at the foot of the curve marked "percentage of value calls" to 100, then upwards to the point of the curve D, it will be seen that this is on the horizontal line equivalent to 125 unvalued calls (see left-hand side of curve marked "unvalued calls" per hour), so that an operator handling 100 per cent. call office calls at a valuation of "two" could only deal efficiently with 125 of such calls; this 125 would, however, be equal to a valued load of 250, which of course is the standard to be attained.

The remaining curves are worked on the same principle.

Valuation of Junction Calls.

Even now we have not arrived at a full valuation of the traffic. included in the figure of 35,470 originating calls previously referrred to were 1,698 calls for numbers on other exchanges, or, as they are better known, "junction calls." It will again be clear to all that more labour would be necessary and more time would be spent in effecting a junction call than its local relative. In these junction calls at least two and sometimes three exchanges have to handle the connections before the call arrives at its ultimate destination, although the operator at Bristol after having obtained the junction exchange or exchanges has no more ringing to do, yet she must pass it on to the sub-exchange operator and supervise it through. Our head office allows a valuation of "two" for each junction call we deal with. By way of explanation it should be pointed out here that "originating" junction calls only have this valuation, and not "incoming" junction calls from other exchanges.

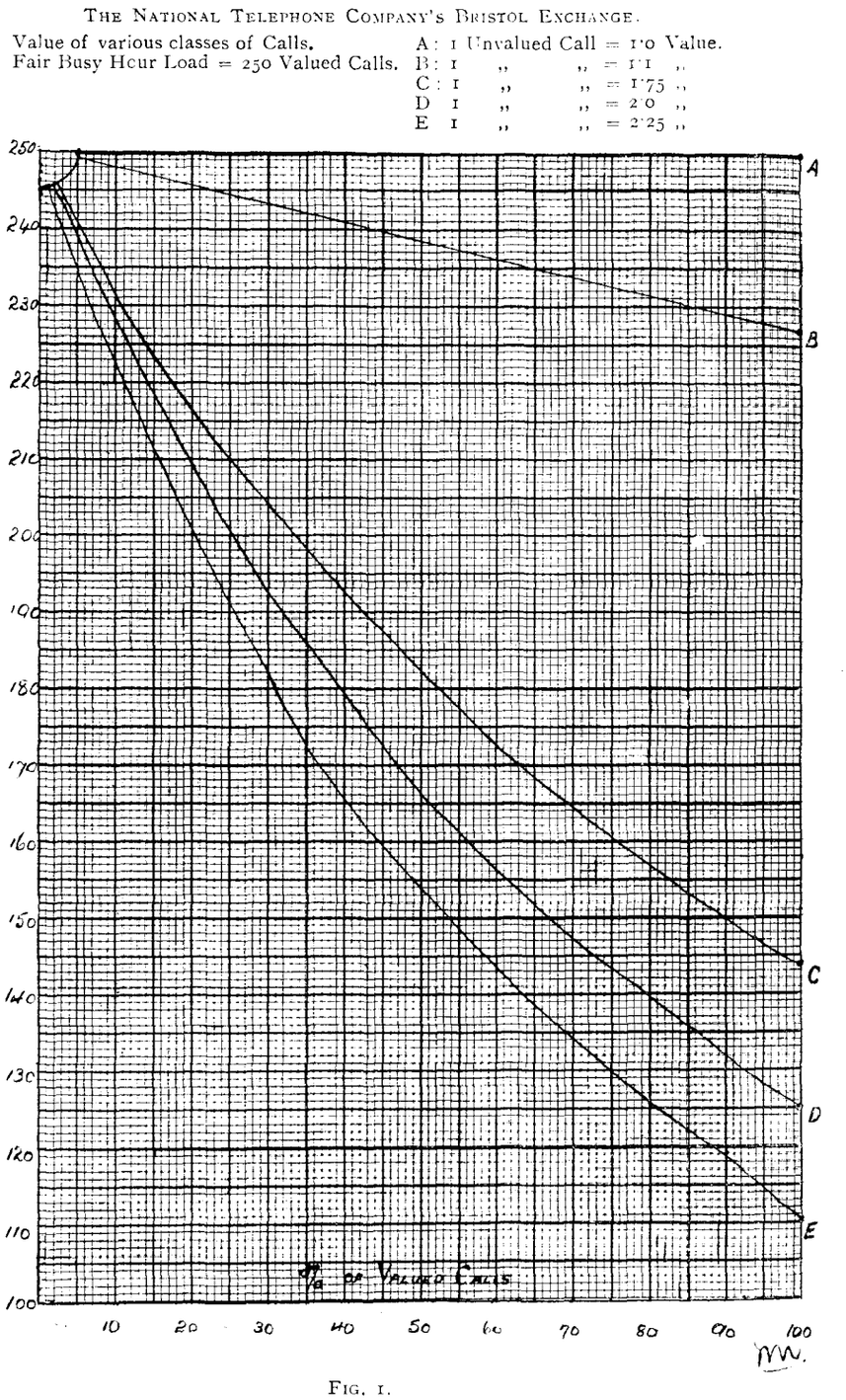


FIG. 1.

Unvalued Calls per hour (as between Classes of Service only)—Valued as between Local and Junction Calls.

If therefore in the figure of 35,470 the 1,698 junction calls are already included and we add another 1,698 we shall be counting the junction calls twice, or, in other words, giving them the valuation of "two" as allowed.

There is just one point on which we should be quite clear. These junction valuations should not be made out before the valuation of classes of service, for the latter, being a value upon actual originating traffic must be based upon actual originating

unvalued calls. The junction valuations must be added subsequently.

Below is given a chart showing in detailed figures the origination of the Bristol Exchange traffic. Column 1 represents the "raw material." Column 2 this material "valued" as between the "various services." Column 3 the same material "valued" as between "services" and "local and junction" traffic; this last column represents the *unit* of work to be provided for, and when compared with column 1 the important bearing it has upon the traffic staff organisation will be fully appreciated:—

Bristol Exchange, Jan. 1, 1910.

CHART OF ORIGINATING TRAFFIC SHOWN IN THREE STAGES.

Time.	Calls actually originated on switchboard (unvalued).	Same calls valued in proportion to work entailed in operation of same according to services (each call average value of 1·15).	Same calls valued between services and also as between local and junction calls. (A value of "2" is given to each originating effective junction call.)
8 to 9 a.m.	842	968	*1,027
9 to 10 ,,	4,137	4,757	4,993
10 to 11 ,,	5,221	5,985	6,265
11 to 12 ,,	4,268	4,908	5,099
12 to 1 p.m.	3,638	4,068	4,221
1 to 2 ,,	1,520	1,748	1,843
2 to 3 ,,	3,924	4,513	4,688
3 to 4 ,,	3,971	4,567	4,709
4 to 5 ,,	3,607	4,148	4,300
5 to 6 ,,	2,718	3,126	3,224
6 to 7 ,,	1,113	1,280	1,355
7 to 8 ,,	611	703	745
Totals ...	35,470	40,771	42,469

* This column represents the unit of work to be provided for.

Thus far we have analysed the work set out by the Bristol telephone subscribers for us to do, and what value we place upon such work. Our next step will be to discuss the number of staff required to deal with this work, and what we assume to be the working limit of an operator.

Standard C.B. Loads for Operating.

At present the working limit of an operator operating at a C.B. board is taken to be "250" valued calls per busy hour. That is to say, on the same principle again of the "busy hour" deciding the pace of the whole organisation, so the load an operator can carry efficiently in the "busy hour" is taken as a standard working limit, and we build our other hourly loads on and around this "busy hour" figure. It does not follow—this will be dealt with fully hereafter—that an operator takes 250 valued calls each hour she may be on duty, but if not taking the quantity she will be taking its equivalent in other ways.

The mere statement of fact in the preceding paragraph that a C.B. operator should efficiently cope with 250 valued calls per hour is, on the face of it, misleading. Referring back for a moment to the chart above given, and seeing that we have 1,027 valued calls shown there as originating between 8 and 9 a.m., it would appear to the lay mind to be an incredibly easy matter to divide this 1,027 by 250 (operator's load), discover that this will divide into 1,027 just four times, and so at once decide that four operators will be necessary to cope with these calls. Such a decision would be quite erroneous; the reason why will be explained shortly.

The statement therefore relative to the operator's load of 250 valued calls per hour should have been qualified by adding the words, "When the operator has only one position to cover, and when all adjacent 'A' positions have operators operating at them." To appreciate this more fully it should be stated that at Bristol Exchange there are 24 working "A" positions. (By "A" positions is meant positions where subscribers call the exchange when requiring service. These positions are called "A" to distinguish them from the junction, or "B" positions, where the Post Office and National sub-exchanges call Bristol.) An "A" position is a certain portion of the board just big enough for an operator to sit at to operate calls, and when all these positions are occupied by operators they sit elbow to elbow, and can assist each other in the manipulation of the calls. At Bristol there are, as previously mentioned, 24 of these "A" positions practically full with subscribers' lines. If there were at all times 24 "A" operators at the board—one on each position—we should be quite justified in stating that each operator could, or should, handle 250 valued calls per hour, for with each position occupied each operator would need only to supervise her own particular section, and assist her immediate neighbours, and, *vice versa*, her neighbours would help her by carrying out what is known as "team work." "Each for all, and all for each"; she would not require to move from her position to effect any connection, and could therefore

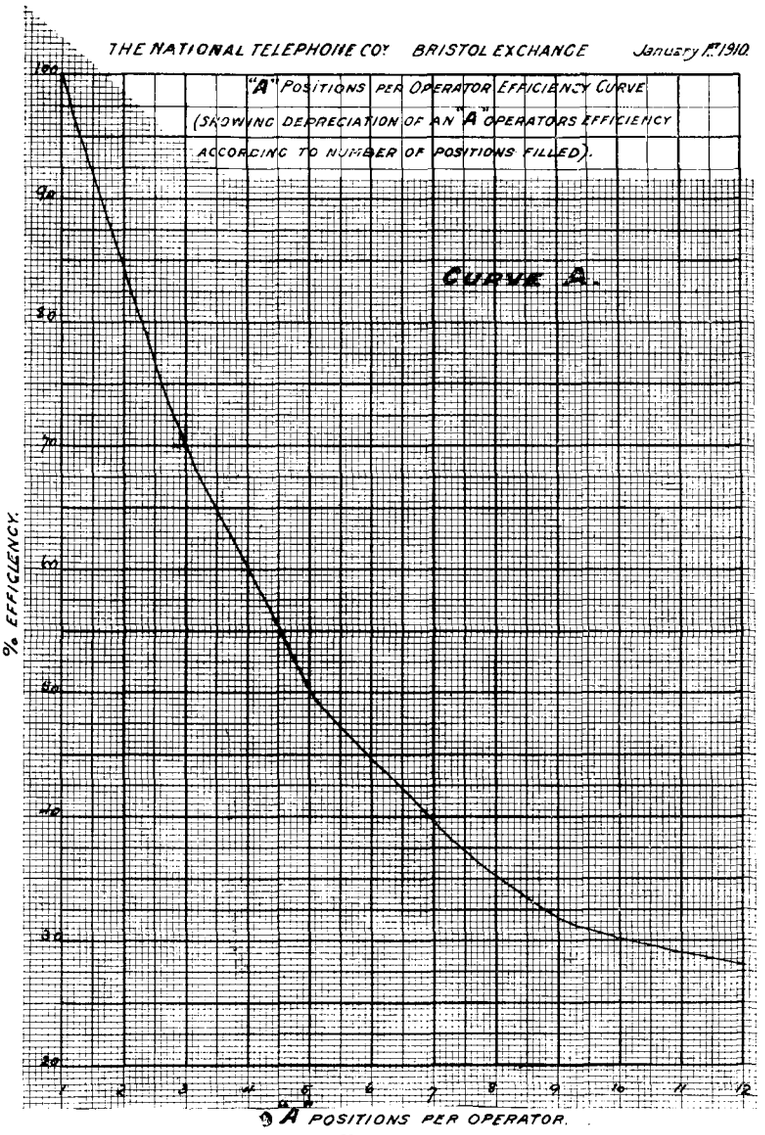


FIG. 2.

devote her entire time to the answering and completing of calls; in fact, she would—assuming other things to be equal—be working under practically ideal conditions, and it is under such conditions that an operator is assumed to be capable of taking 250 valued calls per hour.

On the other hand, assuming there were only four "A" operators, these four would, of course, have to deal with the calls originating on the 24 positions; therefore each operator would have to cover an average of six positions. Accordingly her efficiency for handling traffic would be considerably depreciated by reason of the fact that her attention could not be so concentrated. She would often have to get up from the position she was occupying and walk, say, 6 feet either way—each position is 2 feet wide; six

positions would therefore cover 12 feet—to see who was calling, and so on. Team work could not be carried out to the same extent; in fact, it has been found that when an operator has six positions to cover instead of one, her efficiency for coping with the traffic is reduced by 56 per cent.: so instead of being able to handle 250 valued calls per hour she could only cope efficiently with 110. Therefore the fallacy of the statement that four operators could deal (at Bristol) with 1,027 valued calls in an hour becomes at once apparent.

Do not misunderstand this: 250 valued calls represent a "standard load." If the operators mentioned in the previous paragraph were only handling 110 valued calls each per hour it does not follow that they are underloaded, for the fact must not be lost sight of that to handle these 110 just as much labour and exertion will be necessary on the operators' part as when, under more favourable conditions, they would be handling 250 valued calls each per hour. In this particular case the operators are not taking the quantity—they could not possibly do so—but they are dealing with a 250 "standard of work."

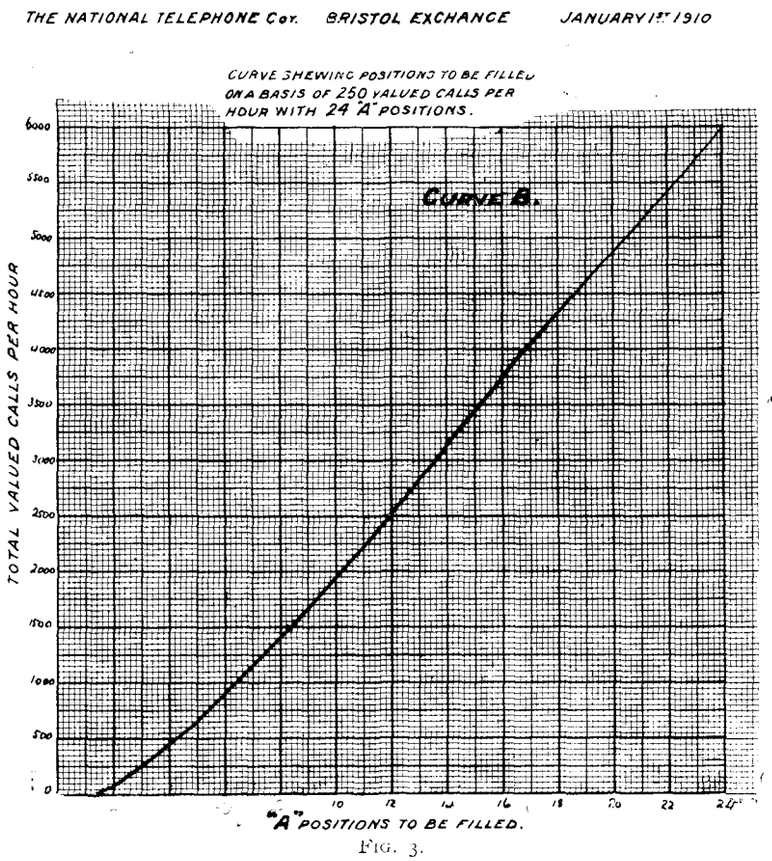


FIG. 3.

As in the case of valuation of calls between a flat rate and a call office, extreme cases have again been taken in this depreciation of efficiency question. There are, of course, intermediate stages of depreciation, and the curve shown below will illustrate these. This curve may be taken as applying to any type of exchange, for an operator is assumed to depreciate in the same ratio whether the exchange be C.B. or magneto, and whether the "A" positions number 10 or 100.

To put this curve another way, we might say that the value of a call increases as the area over which the operator has to reach increases.

This depreciation curve will be termed "curve A" (Fig. 2), and, as stated, it will refer to any size or class of exchange. From this curve we obtain curve "B" (Fig. 3). This latter is of purely local operation only, for, as will be shown, it is dependent upon the number of "A" positions in any particular exchange. To illustrate this, assume there were two exchanges under consideration, one with 24 "A" positions, the other with 62; assume further twelve positions were vacant in each exchange. In the case of the 24-position exchange each operator remaining would have to cover two positions, and her efficiency would be reduced by 15 per cent. (see curve "A"); but in the case of the 62 position exchange we should have left 50 "A" operators to operate 62 "A" positions. Each operator would therefore have to cover 1·24 positions, and her operating efficiency would be reduced by 3 per cent. only (see curve "A"). In each exchange it will be observed that the "A" operating staff is twelve short of its complement, but in the smaller exchange the depreciation is in a greater ratio than at the larger exchange. (Following this out to its logical conclusion we find that the smaller the exchange the more it is affected by absentees.)

The curve "B" is a derivation of curve "A," and is obtained as follows:—

Assume that the exchange to be dealt with has 24 "A" positions, and that from the operating statistics, service observations and general experience 250 valued calls are taken as the fair busy hour load for that exchange.

To obtain the point showing the traffic for, say, twelve positions filled:—

$$\text{Positions per operator } \frac{24}{12} = 2$$

From curve "A" the efficiency of operators covering an average of two positions = 85 per cent.

Hence the allowable load for twelve positions filled:—

$$\frac{250 \times 12 \times 85}{100} = 2{,}550 \text{ valued calls per hour.}$$

This curve is shown in its various stages as applied to the Bristol Exchange, and after the foregoing remarks is self-explanatory.

From the curve "B" it can at once be seen how many operators would be required to deal with the various calls as they arise. Take, for instance, the 1,027 previously referred to. Apply the principles outlined above to this curve and we find that to handle these calls efficiently we should require seven operators, not four, and so on right through the varying stages of the day's work.

Below is given also a repetition of the figures given under "Valuation of Calls" heading, with an additional column showing the number of operators required during various hours. The total of this column will give the number of operating hours required per day (8 a.m. to 8 p.m.) equalling 186. Divide this by eight (each operator's daily working hours) and we get the figure 23·25, which represents the number of "A" operators required between 8 a.m. and 8 p.m. to deal with the daily originating traffic at Bristol Exchange.

Bristol Exchange, Jan. 1, 1910.

CHART OF ORIGINATING TRAFFIC SHOWN IN THREE STAGES.

Time.	Calls actually originated on switchboard. (unvalued).	Same calls valued in proportion to work entailed in operation of same according to services (each call average value of 1·15).	Same calls valued between services and also as between local and junction calls. (A value of "2" is given to each originating effective junction call.	Operators necessary to deal with traffic based on depreciation curve "B" and valued call load.
A.M.				
8 to 9	842	968	*1,029	7
9 ,, 10	4,137	4,757	4,993	20
10 ,, 11	5,221	5,985	6,265	25
11 ,, 12	4,268	4,908	5,099	21
P.M.				
12 ,, 1	3,538	4,068	4,221	18
1 ,, 2	1,520	1,748	1,843	10
2 ,, 3	3,924	4,513	4,688	19
3 ,, 4	3,971	4,567	4,709	20
4 ,, 5	3,607	4,148	4,300	18
5 ,, 6	2,718	3,126	3,224	14
6 ,, 7	1,113	1,280	1,355	8
7 ,, 8	611	703	745	6
Totals	35,470	40,771	42,469	186

* This column represents the unit of work to be provided for

Valued Traffic and Depreciation in Operators' Efficiency.

There is also shown below a curve of valued traffic combined with a curve of efficiency depreciation. It will be seen that on the left-hand side of the curve the calls have been sorted into blocks of 500; assuming there was no such factor as depreciation to be taken into account, this same curve would (on a basis of 250 calls per hour per operator) automatically reveal the number of operators required at any period of the day; seeing, however, that depreciation has to be borne in mind and provided for, a curve has been superimposed upon this one; this second is shown by means of a dotted line, and the shaded portion between the curves represents graphically the efficiency lost through the operators having to cover more than one position.

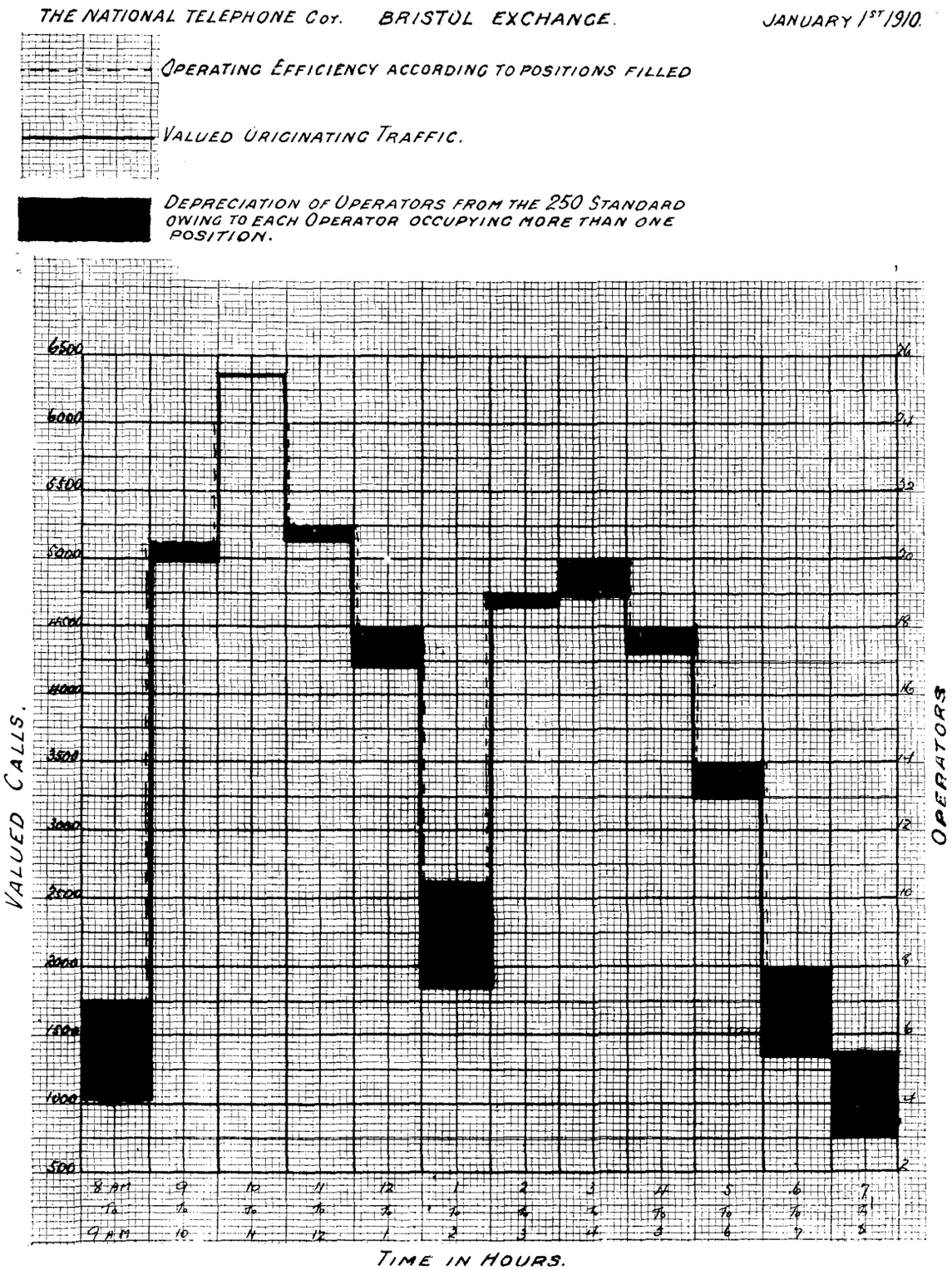


FIG. 4.

Operators' Duties and How Arranged.

From the statistics and curves before submitted it has been shown that 186 working hours per day are required, but, inasmuch as the operators are after all, only human, they are subject just the same as the rest of us to illnesses and indisposition, so that some provision must be made for emergencies of this sort. In addition, the annual holidays, etc., have to be provided for.

To meet these demands the Company allows a percentage of ten over and above the actual operators required, *i.e.*, if at any exchange the operating staff (supervising staff is counted for this purpose as operating staff) actually required on traffic, numbered 100 daily, ten additional would be granted for relief purposes and emergencies. It will be at once apparent that such provision is quite necessary, bearing in mind the important and special nature of the work. Similar reasonings will not apply to anything like the same extent in other branches of the Company's system. Assume, for instance, a ledger clerk of the D. O. staff failed to report on duty any one day, the greater portion of his daily routine might be left over until he returned; at any rate it would not be absolutely necessary for *all* his work to be carried out by his colleagues on the day it fell due. If, however, an operator was away sick, or even away from the switchboard for an hour, her work—the calls she would have been dealing with in the usual course—must be carried on in her absence; there can be no accumulation to be kept for her to deal with upon her return. If we have an inadequate supply of staff during the *busy hour* or any other hour, who would suggest that we might counterbalance this shortage by overtime in the evening? or when we had spare time? No; when a subscriber calls the exchange he requires the connection then and there and not when *we* have the time to deal with him and his call. We cannot tell our subscribers when to use their telephones, so we must be prepared to accept their traffic and deal expeditiously with it just when it suits them to give it to us. This is not quite an unmixed evil, for it carries certain advantages. In the first place the continual searchlight of criticism tends to keep us to the straight path and helps us to keep on the alert and *qui vive* for any defects in our system; and the peculiar nature of the work—its having to be carried out at the subscriber's

pleasure and not ours—is an undoubted advantage to all the operating staff where holidays are concerned, for, when an operator has her annual leave of absence she can resume duty at the expiration of her leave without fear of the bogey of work left over, entries to be brought up to date, and so on. When an operator goes off duty in the evening at 5, 6, 7 or 8 o'clock, as the case may be, her work is behind her and she may come to business the following day with that day's work before her and a clean start off. Each day brings its work and each day must see that day's work done. Further than this, each hour and minute of that day must see the particular work pertaining to that hour and minute carried out at that particular time. This I consider to be one of the advantages of a telephone operator's business life as compared with other branches of the Company's work.

To return to the main thread of this particular subject. Having ascertained that at the Bristol Exchange 186 operator-hours per day are required, by adding 10 per cent. to this we bring the total hours to 204, divide this figure by eight (operator-working hours per day) and a dividend of 25·5 will be obtained. Thus it is found that to cope with the originating valued traffic on Bristol Exchange from 8 a.m. to 8 p.m., and to provide relief staff as explained, 25·5 (26) "A" operators are required.

Arrangement of Operators' Hours of Duty.

The next stage is so to arrange the operators' hours of duty between 8 a.m. and 8 p.m. that the proportion of staff on duty shall correspond with the traffic requirements of the exchange during the various times between these hours. While on this matter it would be as well to point out that there are dangers in underloading the operators almost as great as overloading them. If there is an underload and the work comes disjointedly, the operator's attention is very liable to be taken off her work, and once this happens her efficiency depreciates at once. Every effort must be made to keep the balance of the load either right on the "250" mark or as near as it is possible to get to this. Some of the longest waits on an exchange occur when there has been a slump in calls, the staff are consequently not alert, and when the calls become normal again the staff are not in their usual state of preparedness.

The Traffic Department is, I believe, the only one under the Company where the arrangements of its staff's duties are reduced to such scientific consideration. The workers in the Contract, Clerical or Electrical Departments would never appreciate the full meaning of early and late duties, half-days and so on. The Bristol operators' working day is from 8 a.m. to 9 p.m. each weekday and 9 a.m. to 9 p.m. on Sundays. It will be obvious to all that the same operators do not work a continuous day from eight in the morning to nine at night, or that the same operators will be continually on late duty (9 p.m.) and also working Saturday afternoons. It is by the equitable arrangements of these duties so that all members of the staff obtain their due proportion of early and late duties, half-days, etc., by seeing that the standard hours per week (45) are not departed from, and by so arranging that the operators on duty shall not be either in excess of or insufficient for the traffic requirements that the arrangement of duties is reduced to quite a fine art and proves to be a complete organisation within an organisation—a wheel within a wheel—in itself.

Summarising the three factors outlined above we get:—

(1) Duties must be arranged so that a due and proper proportion of early and late turns, half-days and so on, are equitably distributed between the staff.

(2) The standard hours per week per operator (45) must be adhered to.

(3) Such staff must be on duty as may be sufficient for the traffic needs of each particular time, neither more nor less. If over or understaffed the organisation would be not only inefficient but uneconomic.

When considering duties, individual operators are not considered; the duties are fitted in first, the operators being then adjusted to them.

Take for example the previous statement that to handle the 1,027 valued calls between 8 a.m. and 9 a.m. seven operators were necessary. The curve "B" from which we deduced that this number was necessary was, of course, based upon theory only; it assumes each operator to be capable of dealing with so many calls; it does not take into consideration the human element—it would be impossible for it to do so—that being a purely local matter for practical application. What I want particularly to illustrate is that, knowing seven operators will be required between 8 a.m. and 9 a.m., it would be working quite contrary to the spirit of the curve—although obeying the letter—if seven learners were brought on duty for the period (an operator is counted a "learner" until she has been in the exchange a twelvemonth, unless very special circumstances decide to the contrary). At all large exchanges there are constantly recurring changes amongst the staffs, caused by resignations, additional staff and so forth, so that there is always a fair proportion of probationers and learners at the switchboards. At the present time (January, 1910) there are at Bristol Exchange two probationers and six learners (as above). It

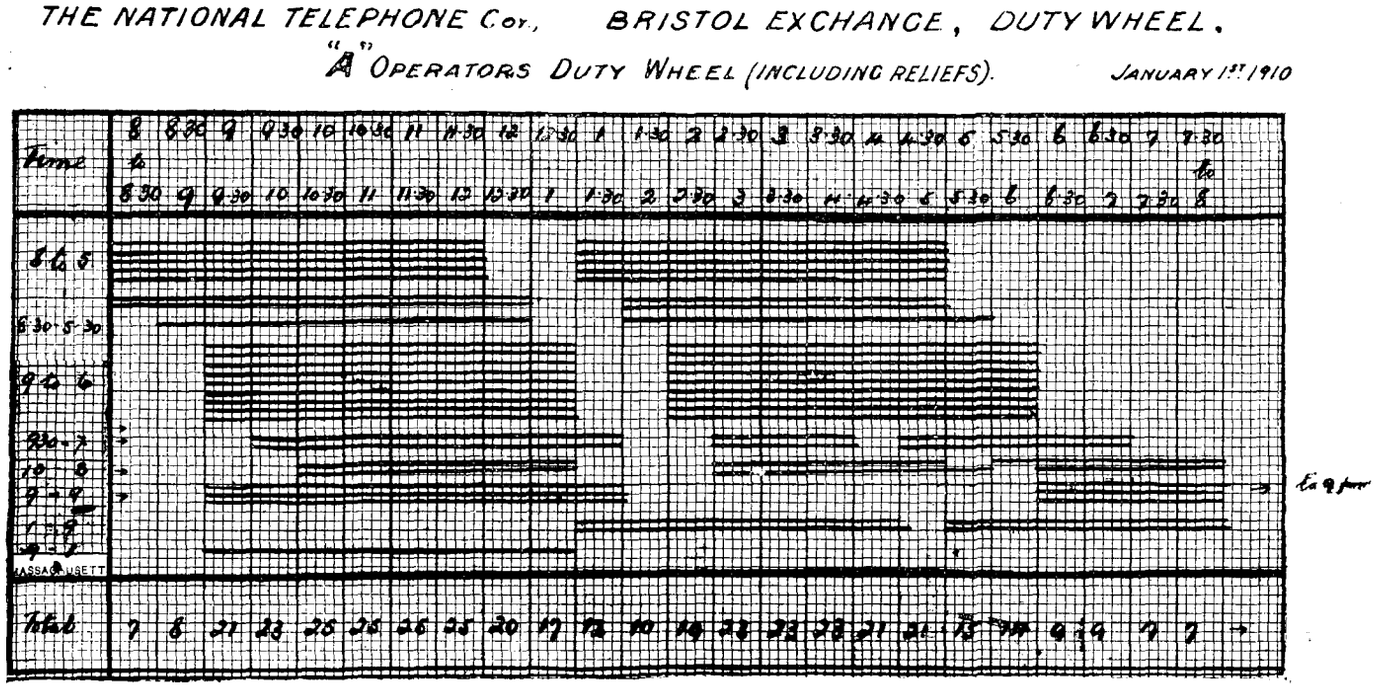


FIG. 5.

is apparent that the staff must be judiciously mingled to obtain the best results. This is what was meant more particularly in the preceding paragraph relative to arranging the duties first and the operators afterwards; once the number of, say, early duties had been settled and working, such duties would be allotted to operators in various stages of efficiency.

The sheet below is a detailed and full list of all the Bristol "A" operating duties, and it will be seen by adding the various hourly columns the number of operators on duty at any one time may be easily ascertained.

Arrangement of Duty Wheels.

It may be stated here that the Bristol duties are worked on a five-weekly wheel, that is to say each operator will rotate from early to late every five weeks, she will get a late duty (9 a.m. to 9 p.m. or 10 a.m. to 8 p m.) each fifth week; then immediately following this will commence the early duty and work down the list again. It will also be seen from above duty sheet (No. 2) that there are 8 a.m. to 5 p.m. duties, 8.30 a.m. to 5.30 p.m., 9 a.m. to 6 p.m., 9.30 a m. to 7 p.m.. 10 a.m. to 8 p.m., 9 a.m. to 9 p.m., or 1 p.m. to 9 p.m. If, therefore, there are 25 "A" operators with consequently 25 duties, five is a very simple factor from which to obtain an easily working wheel, so that these duties are divided out as below:—

No. 1 series.
No. 2 „
No. 3 „
No. 4 „
No. 5 „

The operators are then allotted, as previously explained, according to their experience and service, and for this purpose they are numbered from 1 to 25, each five representing a certain stage of experience and efficiency and one from each five taken to complete each series of little wheels as below:—

Operators Numbers					
1	6	11	16	21 ...	No. 1 series
2	7	12	17	22 ...	No. 2 „
3	8	13	18	23 ...	No. 3 „
4	9	14	19	24 ...	No. 4 „
5	10	15	20	25 ...	No. 5 „

It should be pointed out that the operators in each column above are accounted of equal merit, otherwise it would appear as if series numbered 1, 6, 11, 16, 21 would be more advanced than series 5, 10, 15, 20, 25.

This duty wheel arrangement is quite an elastic one and is subject to ordinary increases in the operating staff; each wheel must depend upon the local conditions prevailing. Suppose, for instance, the "A" staff at Bristol increased to 30, this may mean that the operators would still have to work in five weekly wheels with six operators instead of five in each wheel, or in six weekly wheels with five operators in each; this is quite dependent upon the nature of the service demanded by the subscribers on the new positions. These may be all business lines, in which case the 9 a.m. to 6 p.m. duties would have to be extended, while the 10 a.m. to 8 p m. and 9 a.m. to 9 p.m. would be unchanged. On the other hand, they may contain a large proportion of evening and night callers, in which case the number of late duties would have to be extended, and so on. It will be observed that we are ignorant now as to what future subscribers will require, so must make arrangements to suit the present need, always seeing that such arrangements are based upon a workable and sound foundation for extension in any direction in the future without dislocation of any sort or vital changes of principles and policies, which changes are, in the main, detrimental.

Saturday Duties.

A natural query may be raised here that if an operator works eight hours a day, there being six working days in the week, she would work 48 hours per week, instead of 45, as stated. This would be the case were it not for the half-day principle which, through the traffic being very much below normal on Saturday afternoons (one-quarter of the ordinary day), allows of a large number of operators going off duty early. Such operators as may have to work on Saturday are allowed half-days on Monday, Tuesday and Wednesday, as the traffic on these three afternoons will permit of two half-days on each day. The remaining Saturday duties are made up by the two 1 p.m. to 9 p.m. operators, who work seven and a half hours per day for six days (45 hours per week), two half-time operators who work six days at four hours per day and one special Saturday duty.

Below is given a curve of the Saturday duty sheet; this is self-explanatory.

THE NATIONAL TELEPHONE Coy., BRISTOL EXCHANGE JANUARY 1ST 1910.

SATURDAY DUTY WHEEL.

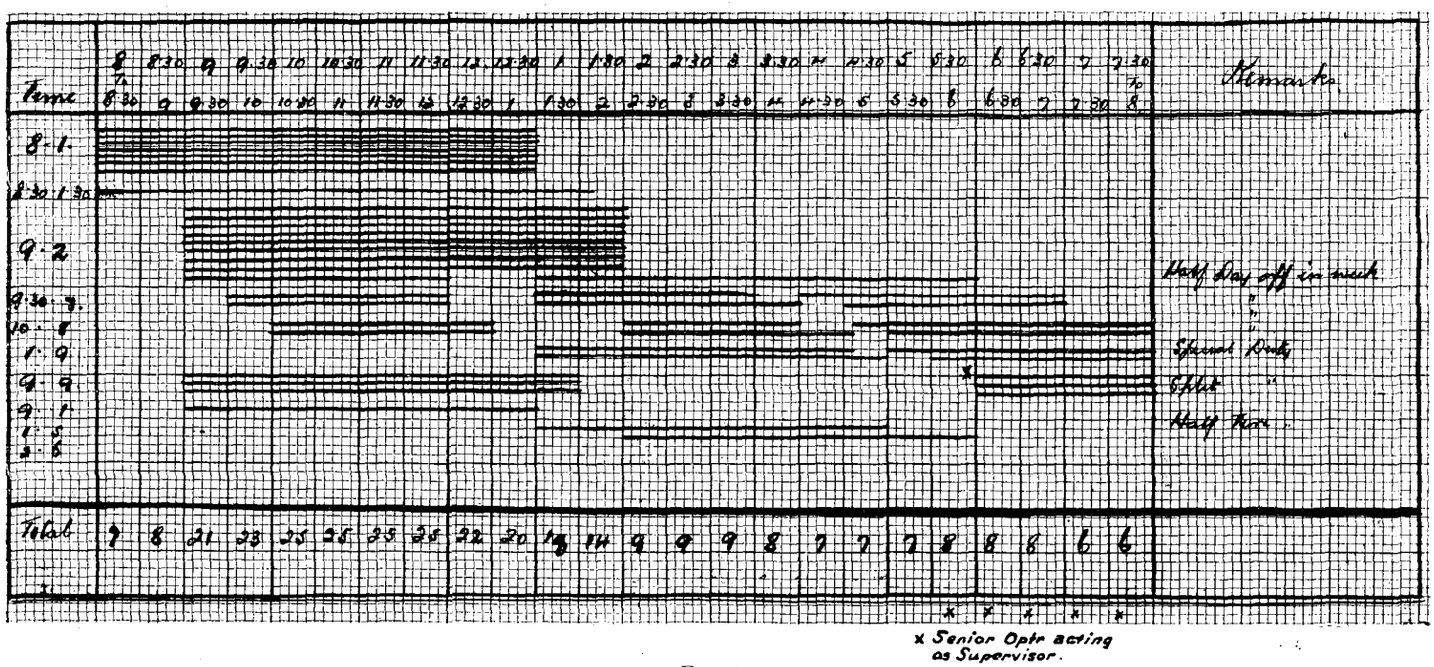


FIG. 6.

The details of incoming junction calls both ringing and order wire, post office calls, night traffic and loads, and so on, have been intentionally omitted from this paper, for, as pointed out in the opening stages, it was thought better to deal fully with one subject than partially to explain three or four cases. The "incoming calls" study is sufficiently important of itself to warrant a special study being made and explained.

There is not much to add with regard to this particular phase of the Traffic Department organisation beyond the fact that to carry out a theory in any department it is very necessary that the staff should loyally co-operate with the heads. There is nothing lacking in this respect at Bristol. A more loyal and enthusiastic staff it would be exceedingly difficult to find. Their chief aim is to do their best and to do so pleasantly and willingly; the "spur" is an unknown quantity, for the natural inclination of the operating staff is to go "all out" for the common goal of a perfect service; consequently there is but one opinion amongst us, and that is that whatever is worth doing at all is worth doing well.

CORRESPONDENCE.

"THE TELEPHONES OF THE WORLD AT THE BEGINNING OF 1911."

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IN conclusion to the remarkable article of Mr. W. H. Gunston in the JOURNAL about "The Telephones of the World at the beginning of 1911," I beg to draw your attention to the development in our city, Helsingfors, the capital of Finland.

At the beginning of 1911 the population in thousands was 140, the number of telephones 8,222, and the number of inhabitants per telephone 17·5.

Helsingfors, Dec. 24. GEORG BERGH, Telephone Engineer.

"DAILY ORIGINATING TRAFFIC—BRISTOL EXCHANGE."

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REFERRING to Mr. Coombs' article in the December issue of the JOURNAL on the daily originating traffic at Bristol, the values set on the various classes of calls do not appear to be consistent.

The values Mr. Coombs sets on the calls shown under "(A)" and "(B)" are no doubt very fair figures, but the value set on calls shown under "(C)" appears to be very high compared with "(B)." Surely there cannot be so great a difference as nearly three-quarters of a unit call in recording on services almost identical.

Then why are so many "amateur" subscribers found on ten party lines, and no allowance made for these on other lines and why should there be any difficulty in ringing back on these party lines and setting up delayed calls? If in every case the whole five rings had to be given, these are short and probably would only exceed the average single ring given on a direct line by a very small amount.

The call offices with money boxes, "(C)," are valued at "2." This I think is a very fair figure, but I think there must be a much greater difference in dealing with calls under "(C)" and "(D)" than ·25, and it is on the call office lines that the "amateurs" are found.

The values set on calls shown under "(E)" seems excessive compared with the other values. Since Mr. Coombs shows under "(D)" that he values the money box call office at "2" and under "(B)" the value of making out a ticket on the measured rate at ·1, therefore "(E)" can only be worth 2·1.

Then as regards outgoing junction calls, does not Mr. Coombs set any value on these, especially those which have to pass through more than one exchange? From the daily load shown the outgoing traffic at Bristol is only 4·6 per cent., but in many exchanges it is anything from 40 to over 90 per cent., and the correct valuation of these calls becomes a vital point in arranging operators' loads. F. J. FROST,

Brighton, Dec. 14. Traffic Manager.

LONDON NOTES.

As usually happens at this period of the year, there is a lengthy list of social events to record. An old Scotchman is credited with saying to his wife on her deathbed, "We'll gie ye a grand funeral, Janet." If social gaiety amongst the staff be a criterion, then the Company has had "a grand funeral." Bank, London Wall and Gerrard Exchanges have each had whist parties, all of them being most successful and enjoyable. East and Avenue staffs had each a social and dance on Dec. 1 and Dec. 9 respectively; at the former, the performance of the "Toy Symphony" Orchestra, and at the latter the exhibition, "Mrs. Jarley's Waxworks," delighted large audiences.

OWING to the particulars not having been received in time, no reference was made last month to the dinner at which the South-East contract staff entertained their divisional contract agent—Mr. W. J. S. Dawson, on Nov. 17. The function was a most enjoyable one, and Mr. A. Mansell proved a capable chairman.

THE London Telephone Society's December meeting was devoted to a discussion on "The Telephone Equipment of Large Buildings." The paper on the subject was the joint production of Messrs. F. G. Baldwin and P. J. Ridd, and not only gave evidence of much original thought and painstaking care, but was illustrated by a series of excellent slides. Both the paper and the subsequent debate raised several points of great interest, many of them touching on matters which are daily becoming more important as the number of large private branch exchanges increases. It is much to be desired that some arrangement should be made for printing and circulating papers of this kind, together with a synopsis of the discussion. True, copies are always placed in the society's library, but many members would like to have them for reference. Telephone literature is somewhat scanty; many of the contributions to our telephone societies would be a desirable and welcome addition.

A WEEK or two ago a number of schoolboys from Harrow visited Gerrard Exchange. Unfortunately the officer who had arranged to show them over found himself unable to do so and forgot to provide a substitute. By good fortune Mr. Arrowsmith, the Exchange Manager, had not left the building, although it was after hours, and he took the young gentlemen in tow, much to their delight and his own. The interest taken by boys in anything electrical or mechanical is a thing apart, and differs considerably both in character and intensity from that of the average grown-up. Indeed, it has been suggested that the latter get more interested in the operators than in the operations. The boys enjoyed in their own way everything that they saw.

THE bill of fare at the Operators' Society on Dec. 12 consisted of two debates—the one subject being, "Can an Average Operator Render Standard Service when Dealing with a Standard Load?"—the other, "Are the Authorised Operating Expressions the Best for the Service?" In the first case, the result of the discussion was an answer in the affirmative. As regards the second, certain expressions were disapproved of by the majority, that decision of course not affecting the view that a list of expressions is necessary. Miss W. Etheridge and Mr. G. Buckeridge led "for" and "against" respectively in the former debate; Miss A. Thornton and Miss G. Harrop in the latter.

THE clerical staff at Salisbury House have never failed on the occasion of a colleague's marriage to show their sympathy and good wishes by a handsome gift to the intending Benedict. The last presentation of this kind for 1911 was to Mr. R. Blackford, one of the Cashiers, the gift being a handsome clock. Mr. Blackford was the recipient of many wishes for a Happy New Year and a prosperous future.

THE affectionate regard in which the members of the Metropolitan staff hold their former chief was demonstrated at a meeting in Salisbury House Great Hall on Dec. 21, when Mr. Clay, on his retirement from the post of Metropolitan Superintendent, was the recipient of a parting gift subscribed for by all grades and sections of the staff in London. Mr. L. Harvey Lowe, Assistant Metropolitan Superintendent, presided over the gathering, and was accompanied on the platform by Mrs. Clay, the Misses Clay, Messrs. S. J. Goddard, F. Gill, W. E. Hart, W. W. Cook, A. Coleman, C. J. Phillips and V. Alsop, Dr. Grosvenor, the Metropolitan Chief Officers, and the members of the presentation committee. The gift was a pianola, and was presented, on behalf of the subscribers, by the chairman in a speech expressive of the regret felt that the pleasant ties which had so long bound superintendent and staff together were now to be severed. Speeches were also made by Mr. Goddard on behalf of the Head Officers and by Miss Minter for the female staff. Mr. Clay spoke very feelingly of his long connection with the service, particularly in London, and of the very happy relations which had always existed between himself and his staff. Prolonged cheers, followed by "For He's a Jolly Good Fellow," greeted the retiring chief as he resumed his seat. After the presentation, Mr. Clay was the guest of the Metropolitan senior officers at dinner in the Quirinal Room of the Café Florence.

As soon as their transfer to the new exchange premises is over, the Avenue staff propose to arrange their annual tea and entertainment to 500 children from St. James' School, Ratcliff, E. This will be the fourth occasion on which the tea has been given, and this year it is proposed to supplement the tea and entertainment by gifts of dolls to the girls, and games, etc., to the boys. Those who have been privileged to help or even look on in former years, when the youngsters were enjoying themselves, cannot but have come away saddened by many of the evidences of dire poverty shown by the little guests; and delighted also that for at least one afternoon and evening a small measure of happiness had lighted up the usual drab and grey of their young lives. The clerk-in-charge at Avenue will be delighted to receive subscriptions from any of the staff who would like to help.

THE first meeting of the London Telephone Society for 1912 was held on Jan. 3, and thus almost synchronised with the date of the transfer to the State. The programme was a debate on "The Future Development of the Telephone System." The subject was appropriate to the time, and to add to the interest of the occasion, the president, in the name of the Committee, had invited a number of distinguished Post Office representatives to be present. The result was a large and enthusiastic gathering, and a meeting which was full of interest from start to finish. The Postmaster-General unfortunately could not come, but he wrote expressing his desire to be present at the February meeting, when Mr. Laidlaw gives a paper on "Automatic Telephony." Amongst the many visitors were Sir Alexander King, Mr. A. M. J. Ogilvie, Mr. L. T. Horne, Mr. W. Slingo, Mr. A. J. Stubbs, and Messrs. Moir and Noble, the London Superintending Engineers. The proceedings were opened by Mr. Greenham (the chairman), making some announcements as to the future of the society, and the intentions of the committee in arranging for that evening's debate. Sir Alexander King said some very happy words in wishing the society a prosperous career under the Post Office, and assured the members that the society and its work would have his sympathy on all occasions. He was followed by Mr. Ogilvie, who opened the debate proper by a very incisive and masterly speech, in which he criticised very effectively the attitude which has perhaps become too common in this country of taking it for granted that any

comparison between Britain and America must necessarily be to the disadvantage of the former. Mr. Dalzell was the first "National" man to speak, and received a very warm welcome on his return to London. It is not possible to enumerate all the speakers, but some good points were made, the topics ranging from tariffs and contract work to education of the staff and the advisability of making London one area for engineering purposes. Almost all the speeches touched the note of co-operation between different sections and departments. If that can be carried out in practice, it will do much to smoothe over the rough places in the new organisation.

As these notes will be the last of the series to appear, a valedictory word may be permitted. When "London Notes" were started the Editing Committee feared that many other towns would also wish to commence such a column, and that of course would have made the idea impracticable. Fortunately Glasgow alone sought to follow in London's steps. Many of the Metropolitan staff have been kind enough to express their interest in and appreciation of the scraps which have been served up from month to month; will they, and all who have furnished items of news from time to time, accept a word of gratitude. The "Notes" were started with a view to increasing the circulation of and interest in the JOURNAL in London, and the aim has been to some extent achieved. That they must now end is regretted by none more than the compiler.

GLASGOW NOTES.

ARRANGEMENTS are being made by the members of the clerical staff to give their popular chief, Mr. J. M. Anderson, some tangible recognition of their high appreciation of him. At the moment of writing full details are unfortunately not available, but it is understood that Mr. Anderson will be the recipient of a handsome roll top desk.

OUR last office dance! This was held on Saturday, Dec. 9, in Prince of Wales' Halls. What may have tended to depress on account of the finality of the function was amply made up in the spirit and zest with which the dancers entered into the enjoyment of the evening. Some 70 couples were present. Messrs. Dewar and Trenwith efficiently performed the duties of M.C.'s.

THE amalgamation of the Post Office and Company's systems in Glasgow has now reached finality. The remaining portion of the Royal subscribers and the whole of the Tron and Bridgeton subscribers were transferred on Saturday, Dec. 16, to the new Post Office Bell and Bridgeton Exchanges and the work of scrapping the National exchanges is proceeding. Shettleston will be transferred later in December.

IT is with very deep regret that we record the untimely death of Miss Catherine McAlpine, who was in the Company's service as clerk in the Fees Department. Miss McAlpine, who entered the service seven and a half years ago, was of an exceedingly bright and cheery disposition and a universal favourite. Miss McAlpine died on Dec. 19 after only two days' illness, as the result of an abscess in the brain. Much sympathy is felt for her relatives in their sad bereavement.

IN connection with the junior prize night competition of the National Telephone Society referred to in another paragraph, the following were the prize winners:—Messrs. J. F. Murray, D. Brough and J. Brown.

In consequence of the "transfer" the society's name will be altered to "The Telephone Society (Glasgow) and West of Scotland Districts)."

On Jan. 10 at the society's next meeting Mr. W. Aitken of the British Insulated and Helsby Cables, Limited, will give a lecture entitled "Automatic Telephones."

THE usual monthly meeting of the Operators' Society and Club was held in the Masonic Halls, West Regent Street, on Tuesday evening, Dec. 5, when a very interesting and instructive lecture on "Psychology" was delivered by Mr. James F. Scott. The subject was handled in a delightful manner, and was thoroughly enjoyed by all present. At the termination of the lecture the chairman took the opportunity of presenting to Mr. Rodger (Traffic Manager), Mrs. Rodger, and Mrs. Peters (Matron) suitable gifts from past and present members of the club, in recognition of their services to the club during the past four years.

Both recipients suitably replied, after which the "club" part of the programme was proceeded with, a very enjoyable meeting concluding with the awarding of some 73 prizes in connection with a grand Christmas draw, which the members of the club had organised.

ON Dec. 18 the Contract Department marked the approaching close of the Company's life by presenting their chief, Mr. J. R. Brown, with a signet ring and dressing case. Mr. A. S. Brodie, Chief Contract Officer, who presided, conveyed the good wishes of the staff to Mr. Brown and referred to the harmonious relations which had always existed between them. Mr. Brown had created a congenial atmosphere which summoned forth the best that was in each one, and enabled them to put their whole heart and soul into their work by his habit of recognition of work well done. With his ever ready words of encouragement he had endeared himself to the whole department.

Mr. J. M. Stewart spoke on behalf of the office staff, and Mr. James Forrester, the oldest officer in the Department, handed over the gifts with the staff's warmest wishes.

Mr. Brown replied in feeling terms, and thanked the staff for their handsome presents and good wishes. He referred to their loyalty to him in the past and expressed hopes for their future welfare in the Post Office.

ON the third meeting of the National Telephone Society (Glasgow and West of Scotland districts) held in the Technical College on Wednesday, Dec. 13, an innovation was inaugurated. The prize magazine night was on the syllabus, but owing to the scarcity of the papers submitted it was decided to postpone the reading of the prize papers until the March meeting and to fill up the evening otherwise.

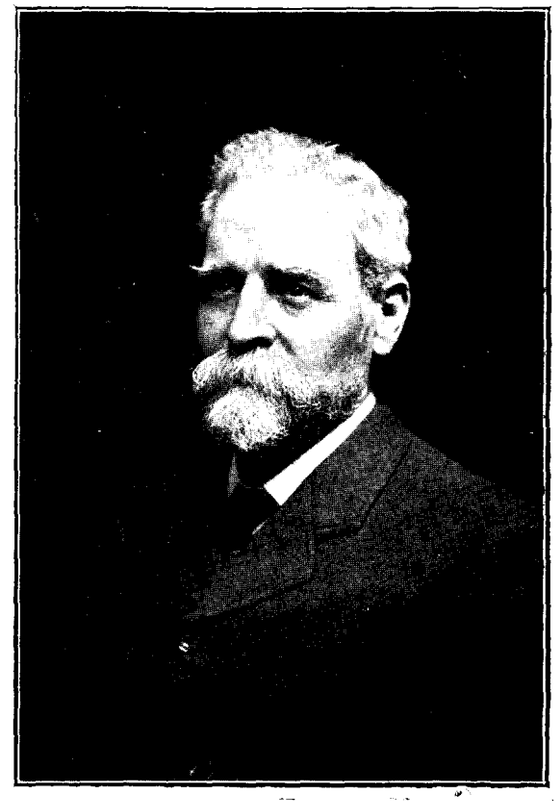
The committee were successful in securing Mr. John Scott, of Birmingham, to give his "Experiences" during his Constantinople visit, and Mr. Scott favoured the society with an exceedingly interesting account of his Eastern trip.

Mr. Scott is a Scotsman and hails from our own city. It was therefore with added interest that we heard him. A most comprehensive review of the various incidents occurring during the recent trip was given and the various "points" were well illustrated by a series of excellent lantern slides. The humorous touch in several of the anecdotes was evident.

There was additional interest in the meeting in that amongst a large and appreciative audience we had Mr. F. Douglas Watson, who will soon leave us to take up his abode in the near East as General Manager of the Constantinople Telephone Company. At the conclusion of the lecture the chairman called upon Mr. Watson to accord a vote of thanks to Mr. Scott, and in characteristic vein Mr. Watson conveyed the thanks of the society to the lecturer. He at the same time took advantage of the opportunity of bidding good-bye to the members of the society.

RETIREMENT OF MR. J. S. HOLT.

MR. J. S. HOLT, Head Office Service Inspector, who retired in December, may claim to be one of the oldest of telephone men, having completed 32 years' service in October last and 54 years' continuous service in telephone and telegraph companies in November.



Mr. Holt joined the Electric and International Telegraph Company in 1857 at Northampton, taking duty at Blisworth in 1859, at Wolverton in 1860, at Liverpool in 1863, in London in 1869, and at Liverpool again (on the death of his first wife) in 1870. He was Supervisor in the Head Post Office, Liverpool, from 1872 till 1877, and was then offered a pension. Under the abolition of office scheme he left the Department in October, 1879, and joined the Bell Telephone Company. Two days later Mr. Holt was in charge of the Liverpool switchroom, where the apparatus consisted of a 75-line board (similar to that illustrated in the JOURNAL for September, 1907, page 121) worked with two American tables.

Early in 1880 the tables were altered at his suggestion and used as single instruments with knife jacks. Double insulated plug cords were made for connections and the capacity of the exchange to deal with calls increased to the extent of the supply of detached cords.

He fitted up the first church telephone in England at Childwall Church in 1880 for the use of a lady living about a mile away. In November, 1880, he was asked by Mr. J. S. Morgan to go to London and had charge of the switchrooms until the amalgamation of the companies.

In 1883 Mr. Holt made the first theatre (electrophone) experiments from the Comedy Theatre to the Hotel Bristol, the play "La Mascotte" being transmitted from the stage to 120 receivers at the hotel and heard by different audiences for five nights.

In 1890 Mr. Holt was appointed Chief Clerk to Mr. Hubert Jackson, who

had been put in charge of London, and later he held the same position with Mr. Sinclair (1891) and Mr. Augustus Calder (late in 1892), and with Mr. W. V. Morten, when appointed manager of the City division.

In January, 1896, he was appointed by the late General Manager, Mr. Gaine, as Head Office Service Inspector, and has in this capacity travelled 104,241 miles by railway, visiting 2,418 centres (of course some of them several times).

Mr. Holt, having worked three years beyond the pensionable age, is now living at Bournemouth in well-earned retirement.

NEWS OF THE STAFF.

Mr. E. W. NEWTON, Divisional Engineer, South (London), was presented at Christmas with a silver-plated inkstand by the engineering staff of the South district, as a token of esteem.

Mr. A. R. FRASER, of the Engineer-in-Chief's staff, has been transferred from the class of student to that of Associate Member of the Institution of Electrical Engineers.

Miss HARRIETT A. FAULTS, Record Operator, has been promoted to be Assistant Monitor, Cardiff.

Miss EVELYN MAUD JONES, Operator, Cardiff, owing to the removal of her parents, has been transferred to London. Prior to her leaving Cardiff, Miss Jones' colleagues presented her with a writing desk and purse as a mark of respect, and with the best wishes for her future welfare.

Mr. R. CURLING, on the occasion of his transfer to Brighton as Local Manager, was presented with half a dozen dessert knives and forks, subscribed for by the Eastbourne and Hastings staffs. The presentation was made on Nov. 27 at the Y.C.M.A., Hastings, by Mr. F. C. Thompson, Local Office Clerk, Eastbourne.

Miss LILIAN HOWE, formerly Traffic Clerk, Portsmouth, who has had to resign on account of the illness of her mother, was presented with a marble clock. Her place has been taken by Miss OLIVE NEWNHAM, promoted from Monitor; Miss WELLS, Operator, Portsmouth, has been promoted to the post of Monitor in place of Miss Newnham, and Miss FLORENCE HUMBY has been promoted to the rank of additional Supervisor.

Miss MARGARET KAY, Clerk-in-Charge, Charing Exchange, Glasgow, has been transferred to Argyle Exchange in the same capacity. The staff in her exchange presented her with a handbag.

Miss LOUISA MORTIMER, Clerk-in-Charge, Royal Exchange, Glasgow, has been transferred to Charing Exchange as Clerk-in-Charge.

Miss ELIZA MILLER, Clerk-in-Charge, Argyle Exchange, Glasgow, has been transferred to Hillhead Exchange as Clerk-in-Charge.

Miss ANNIE CUNNINGHAM, Clerk-in-Charge, Hillhead Exchange, Glasgow, has been transferred to Bell Exchange. The staff in her exchange presented her with a gold bangle.

Mr. JAMES HUTCHISON, Exchange Manager-in-Training, has been appointed Exchange Manager, Argyle Exchange, Glasgow.

Mrs. REID, Travelling Supervisor for outlying exchanges in the Glasgow district, was presented with a pendant from the staff in her exchanges and some members of the Traffic Department staff.

Miss MARION THOMSON, Clerk-in-Charge, Bridgeton Exchange, has been transferred to Central Exchange. The staff in her exchange presented her with a silver-mounted handbag.

Miss JOANNA ROBERTSON, Clerk-in-Charge, Tron Exchange, Glasgow, has been transferred to Central Exchange. The staff in her exchange presented her with a crystal silver-mounted trinket set.

Mr. W. F. MARSH, late Local Office Clerk, Ramsgate, has been transferred to the district office, Dover.

Mr. G. BROWN, Sub-Engineer, Newcastle-on-Tyne, has been transferred to Bradford.

Mr. F. MCARDLE, Foreman, Newcastle-on-Tyne, has been appointed Sub-Engineer in place of Mr. Brown.

Miss LILY SIMM, P.B. Operator, Newcastle-on-Tyne, was presented with a silver toilet set by the operating and clerical staffs on her leaving the Company's service.

Mr. W. DOUGLAS, Engineer, South Shields, who has been acting as District Engineer at Newcastle-on-Tyne during Mr. Jackson's absence on the Inventory staff, was presented with a handsome portmanteau and case of pipes by the district and local staffs. A concert was held on Friday, Dec. 15, to make the presentation, Mr. Abbot, district office, acting as chairman.

Inspector G. COWAN, Rotherham, resigned from the Company's service on Nov. 24 to take up a position as Traveller for the General Electric Company.

Inspector F. Boyce, Rotherham, resigned from the Company's service on Nov. 30.

Inspector H. HEMMINGTON, Sheffield, has been transferred to Rotherham as Inspector.

Inspector J. L. MCNEILLE, Chesterfield, has been transferred to Rotherham as Inspector.

Miss N. BETTS, Operator, Sheffield, has been transferred to the Chester district as Travelling Supervisor for North Wales.

A pleasant surprise awaited Mr. G. GARNER, the popular Foreman of the Wall Set Department, Nottingham Factory, on his return from lunch on Dec. 18, when he found awaiting him a valuable gold albert with medallion suitably inscribed, together with a note requesting him to accept the same as an expression of appreciation and esteem from the workmen of his department.

Mr. J. T. HART, Bolton, was presented with a Swan fountain pen by the members of the Bolton District Telephone Society to mark their appreciation of his services as hon. secretary. Mr. Hart has acted as secretary for the past five sessions.

Mr. R. A. BROADHURST, Inspector-in-Charge, Worthing, has been promoted to be Local Manager, Gravesend.

Mr. G. W. CRADDOCK, Local Manager, Gravesend, has been transferred to Chatham.

Mr. T. S. GEARY, of the Newport staff, was, on the occasion of his transfer to Bristol, presented with a silver albert with a medallion suitably inscribed and a fountain pen. Mr. Williamson, Local Manager, made the presentation, wishing Mr. Geary every success in his new sphere.

Mr. George A. Macdonald, District Manager, South of Scotland district, recently completed 25 years' service with the Company. His staff intend to take advantage of the occasion to mark their appreciation, which intention will assume the tangible form of a presentation early in January.

Miss SCOTT, Clerk-in-Charge, Aberdeen Central Exchange, was presented by the operators with a writing case and fountain pen. The presentation was made on Dec. 29 by the Traffic Manager. Miss Scott feelingly acknowledged the gift and thereafter a programme of music was gone through.

METROPOLITAN STAFF CHANGES.

Mr. F. J. JUDD, Fitter, Gerrard, has been appointed Foreman Fitter.

Mr. W. A. ROBERTS, Fitter, Gerrard, has been appointed Foreman Fitter.

Traffic Department.

Miss ALICE FIELD, Operator, Avenue, to be Supervisor, London Wall.

Miss EVA TANEY, Operator, Hop, to be Supervisor, London Wall.

It is regretted that through an oversight Miss JANET WEECH, Operator, London Wall, was shown in last month's JOURNAL as promoted to be Supervisor. The position was actually offered to Miss Weech, but on account of private reasons it could not be accepted.

Miss ELSIE ELFORD, on her promotion from Kensington to Paddington as Supervisor, was presented with a case of silver teaspoons and sugar tongs by the Kensington staff.

Miss MINNIE CROUCH, on leaving the Company's service, was presented with a leather handbag by the Kensington staff.

Miss FLORENCE BARKER, Operator, Dalston, on being promoted to Supervisor, Holborn, was presented by the staff with a travelling clock.

Mr. F. HITCHCOCK, on his appointment to the position of Night Clerk-in-Charge, Sydenham, was presented with a silver-plated teapot on Nov. 3 by his colleagues at Sydenham. In the absence of the Exchange Manager, the presentation was made by Mr. Edgerton, who wished him on behalf of his many friends every success in his new appointment.

MARRIAGES.

Miss ELSIE NAYLOR, Operator, Central Exchange, Leeds, left the Company's service on Dec. 21 in view of her approaching marriage. The operating staff presented her with a silver rose bowl.

Miss ANNIE M. WILLIAMS, Operator, Morriston Exchange, Swansea district, who has resigned to be married, was presented before leaving with a silver cake basket by her colleagues, the presentation being made by Mr. A. G. Bristow, Traffic Manager.

Miss GLADYS WALSWORTH, Operator, Portsmouth, was presented with a dinner service on her resigning to be married.

Miss JANET LINDSAY, Operator, Shettleston Exchange, left on Nov. 23 to be married. She was presented with a case of spoons by the operators in her exchange.

Miss F. M. LOXTON, Typist, Guildford, on resigning to be married, after seven years' service with the Company, was presented by the staff with a silver tea service, together with their best wishes for her future happiness.

Mr. S. F. LETTY, Local Manager, Guildford, was presented by the staff with a silver-mounted salad bowl and silver cake dish on his transfer to the Eastbourne centre and in view of his approaching marriage. Mr. C. G. Ransley, the District Manager, who made the presentation, voiced the very best wishes of the staff for Mr. Letty's future success.

Mr. R. P. CRUM, of the Engineer-in-Chief's office in Glasgow, was married on Dec. 23.

Mr. R. H. R. KENWAY, Storekeeper of the H. O. stores depôt, was on the occasion of his marriage, which took place on Oct. 28, presented with a set of fish cutlery and an oak case barometer, subscribed for by members of the Stores Department and Engineer-in-Chief's Department.

Miss B. M. HOUGHEY, Senior Operator at Wavertree Exchange, Liverpool, was, on resigning to be married, the recipient of several handsome presents. Although attached to a small exchange, during her nine years' service Miss Houghey had undoubtedly made herself very agreeable to her fellow-workers, and the silver-mounted biscuit barrel, afternoon tea service and the various other mementoes presented will serve as a lasting reminder of her happy telephone days. Miss Houghey, like other telephone employees, entered her new sphere on Jan. 1.

OBITUARY.

We regret to announce the death of Mr. FREDERICK BENNETT, Chief Inspector, Portsmouth. He joined the Company in 1896, after having retired from the Navy as Chief Torpedo Instructor. He was always to the front in any social function, was a good organiser and of a genial spirit. He was very popular with his superior officers and also with the staff. Some three or four months ago he had a very bad attack of influenza and pneumonia, but recovered from them and returned to his duties. About two months ago, however, he was again taken ill and this time some internal trouble proved fatal. He was buried at Kingston Cemetery, on Saturday, Dec. 30. The Company was represented by Mr. Albany, Contract Manager, Mr. Pharo, Traffic Manager, and Mr. Morice, Engineer, Mr. Smith, District Manager, being unavoidably absent.

Owing to the above, a farewell dinner to the staff which was to have taken place was abandoned.

FINAL GATHERINGS AND PRESENTATIONS.

Dover.—The male staff of the Dover district, under the chairmanship of the District Manager, Mr. C. F. Ashby, held their "wind-up" dinner at the Shakespeare Hotel on Dec. 29, when between 50 and 60 sat down to an excellent repast. Following this, a capital musical programme was gone through, interspersed with toasts, which included those of "The Company," "Mr. C. J. Phillips," "The Post Office," "The Chairman," "Absent Colleagues," etc. In proposing the toast of "The Company," the chairman referred to its splendid record, despite the difficulties which had had to be overcome. An amusing feature of the evening was the rendering of a parody on the old ballad "Who killed Cock Robin?" on the topical subject of the recent wayleave dispute with the Hythe Corporation. The duties of accompanist were efficiently carried out by Mr. H. B. Norris, of the district office.

Gloucester.—A farewell dinner and social gathering was held here on Dec. 30. Mr. C. Elliott occupied the chair, supported by the various heads of departments. Mrs. Elliott was also present. A large number of the staff, including lady members, sat down to an excellent repast. After the toast of "The King" had been loyally received, the following toasts were given:—"The Telephone Service," by the chairman, responded to by Messrs. A. Berry and R. McCahey; "The Ladies," by Mr. R. H. Evans, responded to by Mr. J. Riley; "The Chairman," by Messrs. J. L. de Medewe and Mr. F. W. Sceats (this toast was received with musical honours); and "The Organising Secretary and Committee," by Mr. W. G. Jack, responded to by Mr. T. H. Thompson. An enjoyable musical programme followed, those contributing items being Miss Davenport, Messrs. C. Elliott, H. W. Haydon, G. Collins, W. G. Jack, G. A. Greenland and W. E. Dance. Messrs. Howard Smith and S. Brown (visitors) also volunteered their services, their efforts being greatly appreciated. Messrs. S. Symonds and A. Greenland presided at the piano. The whole of the proceedings were enthusiastic throughout, and terminated at midnight with the singing of "Auld Lang Syne."

Norwich.—On Saturday, Dec. 30, the staff of the East Coast district held a dinner and smoking concert at the Café Royal, Norwich, to commemorate the termination of the Company's license and the transfer of its business to the State as from Jan. 1, 1912. Mr. O. W. Stevens, District Manager, officiated as chairman, and Mr. F. Summarsell, Local Manager, Cambridge, as vice-chairman. Mr. R. G. Bagshaw, J.P., Chairman of the Local Board, also attended as representing the Local Directors of the Company, and there was an excellent attendance of close on 80 from all parts of the district, including places so remote as Cambridge, Newmarket, Kings Lynn and Peterborough, while a large contingent came from the Great Yarmouth and Lowestoft area. The occasion was unique in that the representatives of the staff were gathered together for the first and only time from all sections of the extensive East Coast district. The dinner was fixed to commence at 6.15 p.m., and, following a successful *menu*, a highly enjoyable musical programme occupied the rest of the evening until "Auld Lang Syne," sung by the assembled company, appropriately closed a memorable gathering. During the evening the usual loyal toasts were given, and the following were also submitted:—By the chairman, "The National Telephone Company"; by Mr. T. J. Clark, "The Local Directors" (both responded to by Mr. R. G. Bagshaw, J.P.); by Mr. H. H. Wigg, "The Artistes" (respondent, Mr. J. J. Manning). The programme, which was rendered entirely by members of the staff, consisted of pleasantly varied vocal and instrumental selections, and an item which received an enthusiastic reception was a topical song entitled "Goodbye N.T.C." specially written for the occasion by a member of the Norwich staff. During the evening fraternal greetings were exchanged with the Metropolitan brethren assembled at the Holborn Restaurant.

Nottingham.—A staff dinner commemorative of the transfer to the Post Office was held at the Welbeck Hotel on Friday evening, Dec. 29, when 50 of the staff, including representatives from the Engineer-in-Chief's staff at Nottingham, attended. The dinner was followed by a smoking concert, Mr J. T. Cook, Assistant Engineer, being in the chair. The usual toasts were honoured and speeches appropriate to the occasion made, an enjoyable evening being spent.

Reading.—A final meeting of Reading staff was held at the Caversham Bridge Hotel, Reading, on Dec. 30, the District Manager (Mr. A. Maclean) presiding. Several members of the Oxford staff were present. During the evening a telegram of welcome into the State service was received from the Postmaster. The usual toasts were honoured, followed by an excellent musical programme, rendered by the local staff. Dancing was indulged in from 10 p.m. to 11.30 p.m., after which the whole company joined hands and sang "Auld Lang Syne."

Redhill.—A dinner and concert was held on Dec. 22 by the Redhill staff at Lindseys Hotel, Redhill, the Local Engineer, Mr. J. H. Bolton, occupying the chair. Although the smallest of the Metropolitan centres, the staff themselves provided the talent for a most excellent musical programme, which was carried through with great success. Practically all members of the staff in the centre, not on duty, were present, and entered with greatest heartiness into the proceedings throughout.

Sheffield.—A very pleasant and successful function, comprising a dinner and social evening, was held at the King's Arms Hotel on Friday, Dec 15. This was specially interesting in view of the early transfer to the State, and a large assembly of the staff was present. Mr. R. C. Bennett presided at the dinner. A special souvenir *menu* card and programme had been prepared from a drawing by Mr. G. A. Harris, district office, and before the close of the evening the backs of the majority of these were covered with signatures of the members present. To a stranger one of the items on the *menu* side of the card would have been very puzzling; this was "Classification Pudding and Overdue Sauce." After the dinner Mr. Bennett ably proposed the toast of "The King," this being enthusiastically received by the staff. Then came the turn of the artistes, these, without exception, being members of the staff. Mr. W. Thyne, Chief Clerk, proved to be a capable chairman, and excellent turns were rendered by Messrs. Brightmore, Hamer, Hemmington, Hessey, James, Johnson, Keeton, McNeille, McKeown, Stainsfield, Trevor and Young. These items were interspersed by the toasts of "The Staff," "The Transfer" and "The Chairman," ably dealt with by Messrs. Thyne, Johnson, Stokes, Bowring and Rowe. A feature of the evening was the rendering of a topical song to the tune "Hearts of Oak," the words of which were written by Mr. F. P. Ward, of the district office, and its popularity was proved by the excellent manner in which the staff joined in the chorus. The singing of "Auld Lang Syne" terminated the proceedings, and the evening was one which will long be remembered.

Swansea.—The staff of the Swansea district held a dinner at the Hotel Cameron on Saturday evening, Dec. 30, to commemorate the passing of the telephone system of the country from the National Company to the State. Mr. W. E. Gauntlett, the District Manager, was in the chair, and was accompanied by Mrs. Gauntlett and supported by Mr. Glynn Price, a Local Director of the Company, Mr. W. J. Hodgetts (Engineer), Mr. W. H. Crook (Chief Clerk), Mr. A. G. Bristow (Traffic Manager), Mr. E. Woodward (Local Manager, Neath), Mr. L. H. Davies (Inspector-in-Charge, Llanelly) and other officials. There were about 175 present, practically comprising the whole staff of the district who could be spared from duty, nearly a half of whom were female operators and clerks and coming from Port Talbot, Neath, Skewen, Llanelly, Pontardawe, Pontardulais, Morriston, Mumbles, etc., etc., and the room presented a very animated appearance when all sat down to dinner. After the loyal toasts had been duly honoured, the chairman proposed the toast of "The National Telephone Company" in felicitous terms. He complimented the Company as employers, and considered they had always treated the staff well, and in return had received loyal support, and it was with regret and almost sorrow that they (the staff) felt its demise, some of the staff there present having from twenty to thirty years' service, and they were bound to feel the wrench. At the same time they all hoped and indeed felt that the new conditions would not be to their disadvantage, and he on behalf of the staff pledged their support to the Post Office. He also spoke with regret at the severance of the senior officers and Directors, men second to none in the telephone world, and whom they had all been proud to serve under, specially mentioning Mr. Gill the Engineer-in-Chief, Mr. Goddard the General Superintendent, Mr. Anns the Secretary, and not least their esteemed Local Director, Mr. Glynn Price, who always had the interests of the Swansea staff at heart, and whose name he especially coupled with the toast. The toast having been drunk with musical honours, Mr. Glynn Price responded. After thanking the company present for the way they had received him, he expressed the regret he felt at parting with the staff, and on behalf of the National Company thanked them for their past services, and hoped they would prosper and benefit by the transference to the State. He paid a compliment to their energy and zeal while in the Company's service, and made personal reference to the chairman. Mr. E. Woodward (Neath Local Manager) proposed "The Health of the Ladies," to which Mr. A. G. Bristow (Traffic Manager) replied. Mr. W. J. Hodgetts proposed "The Health of the Chairman" in a very happy speech. Mr. Gauntlett, on rising to respond, was received with musical honours and prolonged cheering for him and Mrs. Gauntlett, which indicated his popularity with his staff. He thanked one and all for their support in the past, which he felt sure would be continued both to him or to any successor, and said that he was sure the Company had had no more energetic, loyal or willing staff than those of the Swansea district, when he felt proud to have commanded. Mr. C. A. Bevan acted as toast master and M.C., and the success of the evening was largely due to his efforts and those of a small committee. A very enjoyable musical programme was given by the following:—The Misses H. Bruen and G. Frood, Messrs. Francis, Dennis, J. A. Thomas, J. Walker and Mr. F. Tagholm, the staff comedian, all of whom were heartily applauded. The accompanist was Mr. C. M. Davies. An enjoyable and long to be remembered evening was brought to a close by the singing of "Auld Lang Syne," and the company dispersed with wishes for a Bright and Prosperous New Year, which on this occasion had more than the usual significance.

Warrington.—On Wednesday, Dec. 27, the Warrington, Wigan, St. Helens, and Widnes staffs of the South-West Lancashire district assembled at the Atkinson's Café, under the chairmanship of Mr. H. Chambers (the District Manager), at a farewell dinner and concert prior to the transfer to the State on Jan. 1. After the excellent dinner provided had been disposed of several toasts were drunk, and in that of "The Telephone Company," the chairman took the opportunity in sketching the advance of the district which, it was pointed out, had in the past seven years doubled its number of subscribers. Moreover, the plant in the district and the efficiency of the service, he claimed, were second to none in the country. He paid a high tribute to the loyalty of the staff who had worked under him for the Company, and he felt sure that the same loyalty and efficient service would be extended to the Government. The toast to the Company was drunk with enthusiasm, and after a short interval the concert was proceeded with and was greatly enjoyed, the following members of the staff contributing to an excellent musical programme:—The Misses A. Hough, M. Peake, M. Warren, D. E. Peters and M. Percival, and Messrs. W. R. Gray, T. Taylor, G. Johnson and J. W. Dean. In addition Miss Val Lockerbie, who was present as a friend, rendered a violin solo that was much appreciated. Special mention should be made of the topical parody sung by Mr. T. Taylor, which caused considerable merriment, the chorus being sung with much gusto. This was sung to the tune of "Chin-Chin Chinaman, Chop, Chop, Chop!" As certain of the staff had trains to catch a vote of thanks was here proposed to the chairman by Mr. Ewing (the Local Engineer), to Mr. Ewing by Mr. Gray, and to the committee responsible for the entertainment, together with the artists, by Mr. Woad, the latter being suitably responded to by Mr. Lockerbie as chairman of the entertainments committee. This portion of the evening was brought to a close by the singing of "He's a Jolly Good Fellow" with three cheers for Mr. Chambers, and the singing of "Auld Lang Syne." Refreshments were then served, and for those who could and wished to remain dancing was indulged in, and for those who did not care to dance cards for whist were provided.

Dublin.—A very enjoyable evening was spent by the lady members of the staff at a dance on Thursday, Dec. 14.

Bolton.—The male members of the Bolton district staff to the number of about 60 celebrated the transfer by a farewell dinner on Dec. 30. Mr. A. C. Haley presided and proposed the loyal toasts, followed by "The Telephone Service." Messrs. A. N. Entwistle, R. W. Bell, Wm. A. T. Graham and A. D. Pyke responded. Mr. Whittaker proposed "Our Chairman," Mr. King seconding. The dinner was followed by a smoking concert and terminated by the company's singing "Auld Lang Syne."

Cardiff.—The last annual staff dinner was held in Barry's Hotel, Cardiff, on Saturday, Dec. 30. A most enjoyable evening was spent and the usual toasts were enthusiastically drunk, the chairman's being with musical honours. Thanks are due to Messrs. T. Lucas, J. Parkin, E. Evans, G. D. Bateman, S. F. Whetton, E. Jennings, A. Fradd and C. Hooper, for so ably contributing towards the evening's enjoyment, which was brought to a close with "Auld Lang Syne."

Coventry.—To mark the close of the Company's license a dinner was held at the White Lion Hotel, Coventry, on Dec. 30. As the District Manager, Mr. J. Mewburn, had completed 30 years' service, advantage was taken to make the dinner a complimentary one and to present him with a gold watch as a mark of esteem and regard. After dinner a smoking concert was held, an excellent programme being provided by members of the staff. The following toasts were drunk:—"The King," proposed by the Chairman. "The Postmaster-General," proposed by Mr. A. Booth. "Our Guest," proposed by the Chairman, Mr. W. Dickinson, replied to by Mr. Jno. Mewburn. "The Head Officers of the South Midland District," proposed by Mr. F. Alcock, replied to by Mr. R. S. Grosvenor. "The Ladies," proposed by Mr. G. F. Pope, replied to by Miss Rushall. "The Visitors," proposed by Mr. E. Thurlby, replied to by Mr. Spencer, and "The Chairman," proposed by Mr. W. W. Stewart.

Edinburgh.—The last social gathering of the Edinburgh staff was held on Dec. 27. Forgetting, for the time being at least, the sadder aspect of their meeting they gathered round the festive board, and for a happy period dull care was an absent guest. With dignity and feeling Mr. Worte delivered an address calculated alike to cause regrets for the *regimé* that was soon to be no more and hopes for that which was to take its place. A great undertaking, splendidly organised, was in a few days to pass away, not on account of old age, but in the hey-day of youth and prosperity; old connections of many years' standing would soon be broken by the retiral of men who had so long held the governing reins of the National Telephone Company. Of a pleasing nature was Mr. Worte's next duty, that of honouring "A Telephone Woman," Miss A. St. C. Johnson, by handing to her on behalf of the staff tangible tokens in commemoration of 30 years' service. He hoped she would long be spared to use the gifts and, under the State, serve many useful years. In simple words Miss Johnson acknowledged the gifts; the feelings which prompted the giving of them, she said, touched her more deeply than words could express. Almost entirely from amongst the staff, talent of no mean order was found to provide the evening's amusement; to the other artistes many thanks are due. With joined hands a memorable occasion was brought to a close by singing "Auld Lang Syne."

Bradford.—The officials of the West Yorkshire district held an informal dinner at the Great Northern Victoria Hotel, Bradford, on Dec. 22, when the District Manager (Mr. H. B. Sutcliffe) was presented with a pipe in case as a small token of esteem, after which appropriate speeches were made. Various musical items were rendered and an exceedingly pleasant evening was spent.

The staff of the district and contract offices at the Bradford Centre held an enjoyable "Wind up" at the County Restaurant on Dec. 28, Mr. H. B. Sutcliffe, District Manager, being in the chair. After tea, songs, etc., were given most ably by several members. Dancing was also indulged in and "Auld Lang Syne" was heartily sung before dispersal.

Leeds.—A social gathering in the form of a whist drive and dance took place on Dec. 29, at the Savoy Café, Leeds. The company numbered 123. The prizes were presented to the winners by Mrs. W. V. Morten. Dancing was commenced after supper and was continued until 2 a.m. The company broke up after singing "Auld Lang Syne."

Chester.—At a dinner held at Chester on the evening of Dec. 30, nearly 70 of the staff of the Chester and North-Western district, and friends, representative of all departments, foregathered to bid farewell to the old Company. Coming events failed to cast their shadows on this occasion and a most enjoyable evening was passed—dinner, toasts and an excellent concert. The feature of the evening, looked forward to by all who were in the secret, was the presentation of a handsome pair of silver candlesticks to the District Manager (Mr. T. A. Bates). Mr. Ferguson (Local Manager, Llandudno), who made the presentation, also presented to Mrs. Bates, on behalf of the female clerical staff and operators of the Chester office, a beautiful silver casket, as a slight token of the gratitude they felt for kindnesses received at her hands in past social gatherings. The enthusiasm with which all entered into the spirit of the occassion is worthy of being placed on record—one little group from Llandudno, for instance, having a four-mile tramp at their journey's end, in the small hours of the morning, as a result of their determination to be "in at the death."

Exeter.—On Dec. 20 a smoking concert was arranged at the Castle Hotel, the construction and clerical staff being present. Songs were sung by various members of the staff. Toasts were given of "The King" and "Fellow Employees in Exeter and other Districts," and regrets were expressed at the severance of service with the Company.

Torquay.—The construction staff in the Torquay area had a farewell dinner and social at the Royal Oak Hotel on Dec. 22. After full justice had been done to the fare provided, the toast of "The King" followed, which was enthusiastically received. Reference was also made with regrets at the coming severance of their services with the Company. An enjoyable musical programme was gone through, contributed by members of the staff and friends.

The whole of the staff in the Torquay area met on the afternoon of Dec. 30 to have photographs taken commemorating the conclusion of service with the Company and their transfer to the Post Office. In the evening a farewell concert and whist drive was held in the Post Office Athletic Club Room, Torre. Refreshments were provided during the interval. The arrangements were admirably carried out and did credit to the committee who arranged the proceedings. After the whist drive and prize distribution, dancing and singing were indulged in. The usual toasts were drunk and the Company dispersed at midnight, after singing "Auld Lang Syne" and giving three cheers for the late Company and the King.

Guildford.—A final muster of the Company's staff was held at Weybridge on Dec. 30 by the Guildford district, almost the whole of the available staff being present. During the afternoon a football match, Guildford *v.* Rest of District, took place, resulting in a win for the former by 8 goals to 4. In the evening a dinner was held at the Holstein Hall, nearly 100 sitting down. After the loyal toast had been given by the chairman (Mr. E. Greenwood) and duly honoured, Mr. G. F. Butcher gave "Farewell to the Old Company and Success for the Future," and all joined hands for "Auld Lang Syne." Three ringing cheers were given for the future. After dinner a flashlight photograph of the company present was taken. A capital programme of songs and music followed, all items being most heartily received. The undoubted success of the evening was due to the great enthusiasm of Messrs. Butcher and Dearle, aided by a hard-working committee.

Brighton.—On Dec. 29 the Sussex district staff held a farewell supper and dance at the Old Ship Assembly Rooms, Brighton, in recognition of the termination of the Company's licence. The number present was 139, and before and after supper an excellent programme of musical and other items was carried out under the direction of Mr. J. A. Gladman. After supper a short toast list was gone through, the final one being "The District Manager," which was proposed by Mr. L. Parsons, Chief Clerk, who took the opportunity of making the presentation of a handsome gold watch to Mr. C. F. Moorhouse, on behalf of the district staff, partly as a momento of the occasion but more particularly in recognition of completion of 25 years' service with the Company. Dancing was kept up till a late hour.

Sheffield.—The Sheffield Employees Social Club held a farewell social evening on Dec. 29, when a most enjoyable evening was spent. Dancing was in full swing from 8 p.m. to 2 a.m., and a whist drive before the interval provided entertainment for those who did not care to dance. Refreshments were served about 10.30 p.m., and as soon as the event was over a flashlight photograph was taken of the assembled company. After the interval games and other entertainments were provided for those who did not practice the art, or were tired of dancing. There was a very large attendance, about 300 of the staff and friends being present, and the general opinion of these being that this was the most successful social evening ever held by the District.

Wolverhampton.—The male members of the district office staff met for the last time as employees of the National Telephone Company, at a farewell dinner, on Dec. 30. Mr. Kay, Chief Clerk, referred in a short speech to the staff's relationship with the Company for whom they had been enthusiastic and loyal workers. The affair terminated in a very enjoyable social evening, the arrangements being in the hands of Mr. T. Reed.

Nottingham.—A pleasant little incident occurred on Dec. 19 when the contract officers of the Nottingham district presented a silver cigarette case to Mr. W. Haimes, the Contract Manager, as a mark of their esteem while under his leadership with the Company.

Cork.—What might be termed the farewell muster of the "National" staff in the South of Ireland district took place on Jan. 5. The proceedings commenced with the reading of a paper entitled "The Relation between Automatic Boxes and Telephone Rates," by Mr. Harold S. Hay, which was thoroughly enjoyed by the members present, and a short discussion followed. A concert and dance followed, about 60 taking part, and altogether a very enjoyable evening was spent. The District Manager (Mr. Kidd) presided at the society meeting and concert, and Mr. Lynn, Chief Clerk, acted as M.C. at the dance.

Liverpool.—The present and past members of the Liverpool district, to the number of about 500, held a most successful final dinner and soiree on Dec. 29. The chair was taken by Mr. E. J. Hidden, and amongst the guests present were Messrs. F. Gill, W. W. Cook, R. Shepherd, A. Martin and Mr. and Mrs. T. A. Prout, Mrs. Hidden, and Messrs. G. Gillmore, of the Isle of Man; W. Taylor, of Barrow; and J. Lemon, of Preston, were also present. Mr. Gill, in proposing the toast of the Liverpool district, referred to his old associations with it, and at the same time urged the members of the staff not to be discouraged, although at the outset things might not be all they wished. Mr. Shepherd, responding to the toast of "The Guests," expressed his regret at his severance from the staff and the service, and wished the staff well in their new career. Messrs. W. W. Cook, T. A. Prout and E. J. Hidden also felicitously referred to the changes in prospect for the staff. After the dinner the evening was spent in music and dancing, whist and billiards.

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PRESENTATION TO MR. C. W. SALMON.

A DINNER of the Company's Head Office Stores Department was held at the London Tavern on Jan. 13. A large company sat down under the chairmanship of Mr. Salmon, who was presented during the dinner with a silver cigarette case, suitably inscribed, as a souvenir of the occasion, from members of his staff.

PRESENTATION TO LIEUT.-COL. J. C. CHAMBERS.

THE staff of the Northern Province presented Mr. J. C. Chambers with a travelling case on Dec. 29. The following District Managers:—Messrs. A. E. L. Drummond, J. W. Swithenbank, H. B. Sutcliffe and W. V. Morten, and a large company of the Leeds and surrounding district staffs were present on the occasion. The presentation was made by Mr. Swithenbank, who, of those present, held the longest association with Mr. Chambers in the province. In a few, but very appropriate remarks, he voiced the feelings of the staff in expressing regret at the severance of Mr. Chambers' long association with the staff and his loss to the service.

Mr. Chambers, in acknowledging the gift, thanked the staff for their loyalty and support during the 31½ years in which he had been connected with the Northern Province. Practically the whole of his long career with the Company had been spent in that province, and had commenced and finished in this building in which the presentation was being made on his retirement. He wished the staff every success in their future sphere of duty.

An informal dinner, at which Mr. Chambers honoured the District Managers by his presence, was held later in the evening.

PRESENTATION TO MR. C. J. PHILLIPS.

ON Dec. 30 a representative gathering of the principal officers of the Southern Province met to bid farewell and to make a presentation to their retiring chief, Mr. C. J. Phillips, who for the last ten years has occupied the position of Provincial Superintendent of the Southern Province.

Mr. Howe, in making the presentation—which comprised a handsome gold hunting watch suitably inscribed and an arm chair—voiced the unanimous feelings of regret which prevailed throughout the Province at the severance of a connection which extended over so many years, associated with which were so many pleasant memories and kindnesses to be recalled.

Mr. S. J. Smith, District Manager, Portsmouth, and Mr. A. E. Cotterell, Assistant Superintendent, supplemented Mr. Howe's remarks in feeling speeches.

Mr. Phillips, in returning thanks, expressed himself as being overwhelmed with a deep sense of the great kindness which had been shown him, not only on account of the intrinsic value of the handsome gifts but for the widespread good feeling which had been shown, which would be one of his cherished memories; and said he should look back often in the future to the splendid loyalty which had been accorded him. He thanked them one and all very warmly for their kindness and goodwill towards him and wished them all every happiness and prosperity.

OTHER STAFF GATHERINGS.

Edinburgh.—A most successful whist drive, the last during the life of the Company, was held in the Dining Room, Telephone House, on Friday, Nov. 24. Twelve tables were played, and after a close finish the winners were declared to be Miss M. A. Luca, Operator, and Mr. J. W. Jarvis, Instrument Fitter, the consolation prize falling to Mr. A. Pagan, Learner. After tea had been served the prizes, consisting of a lady's handbag and a fountain pen, were presented by Mr. Worte. A most enjoyable evening was brought to a close by passing a very hearty vote of thanks to the members of the staff who have so ably arranged these functions.

Exeter.—A football match took place on Saturday, Dec. 16, at Pinhoe Road, between the "Office Staff" and "Engineering and Electrical," resulting in a victory for the former by 5 to 1. Mr. Read, the District Manager, kicked off, and Mr. Humphriss, Electrician, proved an impartial referee. It was a good spirited but not by any means a rough game. The return match is to be played at an early date, when the outside staff hope to redeem their laurels.

Bristol.—A successful social was held at the Queen's Hotel, Bristol, on Saturday, Dec. 16. The programme consisted of whist, games, dancing, etc., and was thoroughly enjoyed by all present. Mr. E. L. Preston, Engineer, awarded the various whist prizes and also acted as M.C. for dancing. The attendance was limited to members of the staff only and about 70 attended. Every credit is due to the committee for an enjoyable evening.

Newport, Mon.—On Thursday, Nov. 23, the staff of the Newport centre held their second and last social gathering of the year at the Beaufort Café, Newport, when between 60 and 70 members of the staff, including a few visitors, were present. Various forms of amusement were entered into to the delight of all present, interspersed with music and dancing, songs being rendered by Miss H. Thomas, a former operator, who is the possessor of a fine voice. There was also a violin solo by Mr. T. Geary, the accompanist being Miss E. E. Fennell. During the interval a most interesting presentation took place in the form of a handsome smoking cabinet and companion case of pipes to Mr. G. Field, who was Acting Local Manager at Newport during the absence of Mr. Williamson, transferred to London on the Inventory staff. Mr. D. Driscoll, who made the presentation, referred to the esteem in which Mr. Field was held by every section of the staff, and they felt they could not let him return to Cardiff again without giving him something to remind him of the happy association that existed. Speeches were also made by Mr. R. Williamson, Inspectors Cooke and Payne. Mr. Driscoll then handed the cabinet to Mr. Field (to the singing of "He's a Jolly Good Fellow"), which bore the following inscription:—"Presented to Mr. G. Field as a token of esteem and regard from the Newport staff, November, 1911." Mr. Field very feelingly replied, saying that when accepting the invitation to be present at the social he and Mrs. Field had not any idea of coming there to take back such a handsome present, and he did not know what action of his merited it. He, however, heartily thanked them one and all, and he should always remember them for it. The company then adjourned for refreshments, after which further games and dancing were indulged in until 1 a.m. Great credit for the success of the evening was due to the untiring efforts of Miss Van Riel, Clerk-in-Charge, together with the committee, consisting of the Misses E. M. Iles and E. Turner and Messrs. R. W. Richards and A. G. E. Payne.

Leicester.—Under the auspices of the Leicester Telephone Society a dance and social evening was held on Dec. 6 in the Secular Hall. From the first success attended the efforts of the organisers and the demand for tickets soon exceeded the supply. Great credit is due to them, since ladies and gentlemen were present in practically equal numbers, thus alleviating the partner difficulty usually so perplexing to M.C.'s. The programme was so arranged that entertaining items interspersed the dances. Miss Kibert, Miss G. Clarke and Madame Kitty Lewin each contributed songs, which were well received. "Farewell N.T.C." now becoming almost inseparable with "telephone" gatherings, was sung by Mr. Harry Cosgrove in vigorous style, the refrain being echoed by everyone present. Humorous items by Mr. Teddy Brown caused much merriment on several occasions between the dances, which were prolonged until one o'clock, "Auld Lang Syne" concluding an evening that reflected great credit to the M.C.'s Messrs. A. W. Garrard and A. Duckering.

Bath.—An Association football match was played on Dec. 2 against Bristol, and Bath was defeated by 5 to 0. A smoker was held the same evening and the following contributed to an excellent programme:—Messrs. Hagley, Drew, Eager, P. Jones, Beal, Saunders, Harding, O'Toole, Leonard and Ashbee (Bristol); Messrs. Ashbee, Cole, Challis, Blackmore, Bowden, Griffiths, Owen, Matthews and Critchlow (Bath).

London.—The traffic staff at Bank held their first whist party of this session on Tuesday, Nov. 21, at Ye Mecca Café, Ludgate Hill, in aid of the Hospital Saturday Fund. There were 162 people present and the committee hope to hand over a substantial sum in aid of the above fund. The prizes were all given by friends interested in the work of the fund and were kindly presented by Mr. Clay.

LOCAL TELEPHONE SOCIETIES.

Bath.—The third meeting was held on Dec. 13 before a good attendance. Competitive papers were given by Messrs. Ashbee, Want, Critchlow, Solomon, Wheeler and Sturge, of the Electrical Department, and a most instructive and entertaining evening, providing a number of useful suggestions, resulted.

Birmingham Operators.—The first meeting of the session was held on Nov. 30, the president, Mr. E. Williamson, presiding. A most interesting paper was read by Mr. Scott on his recent visit to Turkey. The country was depicted by means of lantern slides, of which Mr. Scott has a good selection. This afforded a good opportunity of realising the difficulties his party met with, some of which were very amusing, while others were of a more serious character.

The second meeting was held on Dec. 14, Mr. C. W. Piggott presiding. Members of the traffic staff contributed short papers for competition on the following subjects:—"General Remarks from Subscribers," E. Lane; "Ticket Recording," N. Fookes; "Private Branch Exchange Operating," anonymous; "An Operator's Farewell to her Board," A. Dudley; "Call Offices," anonymous; "Punctuality," M. Farmer; "Automatic Cut-Off," E. Phillips; "A New Operator's Dream," anonymous; "A Successful Operator," anonymous; "Testing Operators' Duties," E. Cadd. The committee offered three prizes, but owing to the papers being of exceptional merit three extra prizes were given. The judges were Miss Hicks, Mr. Lett and Mr. Lambert, and the winners were declared as follows:—"Punctuality," Miss M. Farmer; "An Operator's Farewell to her Board," Mr. A. Dudley; "General Remarks from Subscribers," Miss E. Lane; "Testing Operators' Duties," Miss E. Cadd; "Ticket Recording," Miss N. Fookes; "A Successful Operator," Miss R. Raggett. Mr. E. Williamson kindly consented to present the prize money to the successful writers and complimented them upon their papers. There was a good attenda ce.

Bolton.—The second meeting took place on Nov. 23, Mr. A. C. Haley being in the chair. A paper on "Originating Traffic" was read and followed by discussion. The operators were specially invited and a number attended.

Bolton Operators.—At a meeting on Nov. 29, attended by all the operators, it was decided to form a society. A committee and the following officers were elected:—Mr. A. C. Haley, District Manager, president; Miss V. A. Slater, chairman; Miss E. Wood, hon. treasurer; Miss A. Lord, hon. secretary. A short paper on "Traffic" was read the same evening.

Bristol Operators.—The second sessional meeting was held on Dec. 7, when a paper was read by Mr. A. E. Coombs, Traffic Manager, on "Time Values of Calls; Units of Work, etc." There was a good attendance. Mr. A. Perkins, District Manager, presided.

Brighton.—A meeting of this society was held on Nov. 27, Mr. Moorhouse, District Manager, presiding. The programme consisted of "Knotty Points," addressed by certain members of the staff to certain other specified members. The questions had been arranged beforehand, and were judiciously distributed, the result being a most interesting and instructive meeting. Those asking questions were Misses Trott, Webb and Agutter; and Messrs. W. Davis, S. Lindfield, J. C. Grover, E. J. Clarke, H. Hine, E. H. Elliott, W. Knight, H. Summarsell, P. Hart and W. Young. Those who replied to the questions were Messrs. E. H. Elliott, E. Luetchford, W. Young, F. J. Frost, W. Jenkins, S. Lindfield, C. Hooper, H. Diplock, W. Knight, C. Lamper, E. Dyer and J. C. Grover. There was a good number present and the meeting was so instructive that it was felt that others of a like nature should follow.

Cardiff Operators.—The inaugural meeting of the session was held on Oct. 31, Miss B. W. Williams, Monitor, being in the chair. There were 25 members