

THE National Telephone Journal

VOL. V.

DECEMBER, 1910.

No. 57.

TELEPHONE MEN.

LV.—CHARLES WILLIAM SALMON.

CHARLES WILLIAM SALMON was born in 1858 in London, where he was educated, first at a private school and finally at a grammar school, the curriculum of which included a special course of studies for those intending to enter the Civil Service. Whilst engaged in these studies, during the closing terms of his school life, he was offered a position in the East and West India Docks Company (now merged in the Port of London Authority), which, at that time, had recently remodelled its service largely on Government lines; and, seeing that the prospects held out appeared to be favourable, he accepted the offer. In due course, Mr. Salmon secured successive promotions, which had to be gained both by recommendation and by competitive examination. He still retains a very distinct recollection of the first time he saw and spoke through the telephone which afforded connection between two of the Dock Company's offices—a Gower-Bell instrument fitted with long, flexible ear tubes—and little imagined at the time that he would ever be engaged in the telephone enterprise. The time, however, was to arrive when the secretary of the United Telephone Company (Mr. Thos. Blaikie) invited, by permission of the Dock Company, those officials who cared to apply to take up a position in the former Company. Mr. Salmon was the man eventually selected and entered on his new duties in February, 1883.

After spending some time on the books connected with stores matters, he was placed in charge of the Stores Department, and although the changes he has witnessed during the onward march of the telephone industry, not only in the administration and *personnel* of the staff, but also in the type of material employed in the construction of the system, are many and great, his energies during the whole of his service with the Telephone Company have been solely devoted to work connected with the management of

that department. The United, being the parent Company to which the old National and Lancashire and Cheshire and other companies were subsidiary, and holding the patent rights, had the entire control of all telephones used throughout the United Kingdom. It supplied them to these subsidiary companies, keeping a strict account of every receiver and transmitter so forwarded, and had to maintain a sharp look-out for instruments which infringed its patents. Many were the quaint and curious devices made by the enterprising in the hope of evading these patents, which, passing through Mr. Salmon's hands whilst these patents continued in force, were found to be infringements.

Looking back to the time when not only were Blake transmitters the best known instruments, but when some of the primitive Edison chalk transmitters were still in use, he is still able to view with amazement the vast strides which have taken place in telephone plant since that time, although his position has naturally familiarised him, step by step, with the improvements which have taken place in instruments, cable systems and switchboards, which latter, from fairly simple contrivances, have advanced to such marvellous complexities.

Mr. Salmon was not slow to realise the advantage of some knowledge of the technical intricacies of the work which he had undertaken, and shortly after his appointment he attended lectures on electrical subjects by Professor Sylvanus Thompson, and found these, together with the laboratory work and reading which he did at the same time, of great value in dealing with the affairs of his department.

On the amalgamation of the various companies under the title of the National Telephone Company, Mr. Salmon took over the charge of the department dealing with the stores required for the whole of the United Kingdom. Very soon after it was decided that



the ordering and supplying of all stationery should come into the department, and a system was instituted for dealing with this branch of work, which, after being improved from time to time, has resulted in the adoption of methods by which the enormous demands of the Company's various centres are enabled to be dealt with efficiently. To this work was added later on the control of a printing establishment, which from the employment of a single hand-machine worked by one compositor and boy-assistant has grown to such dimensions as to employ four large electrically-driven machines and thirteen compositors, and men of other grades.

The last branch of the Company's work delegated to the department which Mr. Salmon controls was the compilation of the Telephone Directory. Each year the work in connection with this gigantic publication increases, and the number printed during the last twelve months has reached a total of close upon a million of these books.

The Stores Department, outside its ordinary work, has recently been engaged in the compilation of a huge mass of figures, in reference to the Inventory of the plant which is being taken. This has meant three months' continuous late work for a large staff, the time of leaving on most evenings being nearer ten o'clock than five o'clock. It is, perhaps, not out of place here to say that if it had not been for the exceptional knowledge possessed by Mr. Salmon and his senior officers, coupled with the admirable way in which the staff engaged threw itself into the task set before it, the work would have taken considerably longer than it actually did.

Mr. Salmon does not court publicity. An effective worker and always at his post, his unique experience and knowledge of everything that appertains to the department over which he has presided for nearly 28 years has enabled him to render to the Company valuable and sterling service.

Mr. Salmon indulges in occasional games of tennis and billiards. His chief recreations however are walking and reading—mostly historical and biographical works.

PAPERS.—THEIR WRITERS AND AUDIENCES.*

By EUSTACE HARE.

(Concluded from page 158.)

I AM inclined to think that a paper which expresses views rather than facts, provided it is not strictly technical appeals to a larger audience (not a wiser, mark you) than either the "purely descriptive" or "productive" types, though it is not perhaps of the same practical value. One reason for this is that, as a rule, the subjects chosen are those on which all classes of our staff hold some opinion or are able to form an opinion as the writer unfolds himself. As an example one might suggest a paper on "Daylight Saving." This is a subject on which I suppose everyone is more or less interested, and I can imagine widely divergent views upon it, not only as to the main idea but as to the manner of carrying it out and the extent to which the principle should be applied. Possibly no one would be a penny the better or worse for the debate, but many would have something to say about it, and would say it, some with the consolation that the matter not being capable of unanimous agreement one opinion is as good as another, which is one of the charms of a debateable paper.

But perhaps its greatest use is achieved in this way: the number of men and women who have ideas and theories more or less vague simmering in their minds is legion, but the number of those who are able or think it worth while to spread them out, as it were, by committing them to paper is comparatively small. The initial difficulty of laying hold of them, their elusiveness may be, is enough to act as a deterrent and to swell the ranks of the visionary. They must wait for the man of persistence, with courage to attack and unravel them, with a natural or trained faculty for sequence of

reasoning, and who by practice in recording his thoughts has acquired the essential of writing—viz., exactness of expression. As Francis Bacon puts it in his essay on "Studies," "Reading maketh a full man; conference a ready man; and writing an exact man."

So much for papers in particular. I have now a few words to say on the writing of them in general, and first, I do not wish to be misunderstood in what I said just now about phraseology. The primary aim and object of a paper is to educate and to interest. That is to say, subjects, facts and theories come first; be the medium of expression ever so poor and crude, there they stand for what they are worth. But after that, and closely too, should come the careful choice of words with which, to the best of your ability, you may convey precisely what you have in your mind. I am not, be it noted, speaking of what is known as "style" or "mannerism," acquired or natural. These are totally different things, and are not strictly necessary for our purposes; they are for writers, *qua* writers, men who have to make a literary reputation or desire to leave one behind them. I am advocating care in this respect chiefly for the sake of clearness.

No one doubts that conciseness is a right and good thing to aim at, and that to compress an idea into a few words, while making it intelligible, marks a clever or painstaking man.

The more often you see your thoughts in type the more you will recognise the need and advantage of exact phrasing and phraseology. The well-known advice never to use a word of two syllables when a word of one will do is no doubt sound in principle, but if too slavishly followed may lead us into sluggish, slipshod roundabout ways, longer in the end and eminently uninteresting. To that advice I would add, "Never be afraid of a word, however long, which exactly conveys your meaning."

Avoiding, of course, the snobbery of the pedant, what reason is there that you should not give of your best? And to give of your best is to weigh every sentence you write. Doing this is to assume a standard of intelligence in your audience at least equal to your own, which is only what they are entitled to expect. If, to use a common expression, you are writing "over the heads" of your listeners, it is for them to discover it and not for you to pre-suppose it; and if you do, and attempt to alter your mode to suit a hypothetical situation, you are courting failure; for you will probably strike a note of insincerity, which your audience will be quick to detect and to resent. And a tinge of egoism is better than a layer of hypocrisy. I think it was Beethoven who once refused to alter a difficult passage in an overture "for the sake," as he expressed it, "of a pitiful fiddler." He intended that passage to stand the test of time, not of occasion: and in that sense, though perhaps a long way off, the position of the writer of a paper is similar. He is deliberately putting something down to run the fire of a critical audience, and as he puts it, so it must stand; he is not to be compared with a debater who must speak on the spur of the moment, and who may, without blame, regret he had not spoken better. The writer takes his own time, and if he makes not the best use of it is not to be excused for sins of incompleteness and inaccuracy.

It is almost superfluous to say that one of the most important points in a lecture or paper is to gain and hold the attention of your audience. It is true that "good wine needs no bush," but a natural corollary is that the drinker should possess a cultivated palate; and it must not be assumed that every listener is ready or is in the mood to take in and appreciate at once all you say. It is better, in my opinion, to carefully lead up to your point than to fire it point-blank and expand it afterwards; for by so doing you will awaken the keener interest, in the same way as a beautiful landscape is best appreciated when slowly revealed through a disappearing mist. A useful adjunct here is, I think, the employment of metaphor, but with a judicious and sparing hand, and not to the overwhelming of the idea you desire to fix, like an over-framed picture. Unless you exercise due caution and employ some art in leading up to your facts, giving time for them to ripen, the result will be that some of your audience will never gather them at all, while others in grasping them will miss important links in your chain of argument, which will only become apparent in the subsequent discussion.

But if discretion is needful in the use of simile, it is still more

* It should be noted that in the first part of this paper in the November JOURNAL the words: "Bear in mind the writer propounded nothing, so far as I know," were, by a printers' error, transferred from the top of the second column of page 157 to the top of the first column of page 158.

needful in attempting humour. Telephone societies do not foregather for amusement, but for solid work: the members being, as a rule, very much in earnest, of which their presence alone is sufficient evidence; and to find their attention now and again distracted from the main subject by a writer's efforts to be funny must be jarring in the extreme. It disturbs not only the thread of the subject, but the hearer's interpretation of it: for every paper of merit demands concentration of mind on both sides, but especially on that of the audience which has to absorb in half an hour what the writer may have been weeks in preparing; and this is impossible where there are frequent interpolations of remarks solely intended to raise a laugh. If humour is introduced at all, it must arise naturally out of the context, must appear unenforced, and the drier the better. The worst form, of course, is that where the joke is really the central figure, to be approached sometimes very awkwardly—by the most subtle path that the originator can conceive.

But do not imagine I underrate the value of those occasional light touches which do so much to hold the attention and to mitigate monotony. They are the high lights of a good and interesting paper, and if tactfully used serve to set off the main idea in bolder outline; but they must be treated only as accessories, neither interrupting, nor interfering with the thread of your argument, but actually helping it.

To write frivolously is about as easy as to write ponderously: both styles may be "natural," but neither is good: the difference between the two probably being that the one is penned fluently and the other laboriously. Fluency either in an author or speaker is admittedly a gift, but it is a gift demanding judicious cultivation, or it degenerates into mere sound and fury. The fluent mood in an unaccustomed writer is a thing to be suspicious of. At such times it is not a bad plan for him to sleep on his output before finally approving it: my own experience being that the quicker one writes the more one has to correct.

To write crisply is not necessarily to write lightly or humorously, and it does not denote speed; more often the reverse, for to say much in a few words betokens great skill and much practice in the literary art. If you read the working lives of our greatest authors you will learn that many a line which runs so smoothly that it seems to breathe spontaneity is the result of hours of careful thought and of many alterations.

Lastly, the most difficult thing the writer of a paper has to do is to efface himself and to identify himself with his audience, both in the writing and the reading. Having chosen his subject on the strength of his knowledge of it, the one object before him should be to reach the mind of the meeting. In the time at his command he cannot hope to exhaust his subject; not a tithe of what he himself knows about it and how he came to know it can be put to paper. From the many phases and wanderings of his knowledge he must choose what he believes to be the chief and best points of his subject and work them out to a conclusion, if such be possible. And in choosing them he must make the best use he can of his sense of proportion, eliminating encumbrances and excrescences like the skillful summing-up of a judge. He should remember that in front of him are, maybe, fifty or a hundred intellects, some better, some poorer than, and some equal to his own, and he should imagine that collectively they represent himself, as he was before he put pen to paper. It is possible that not one in his audience would be able to recall at the finish every point he has put forward: to some, an idea here or there is deemed trivial or superfluous while the same idea to another has seemed all important; some will have fixed upon a point which particularly interested them, to the exclusion of many others or to the subject as a whole: while others will have done the reverse, have taken a birds-eye view without troubling about detail. No two will, perhaps, have received the paper in exactly the same way.

The writer need not reckon with this; the position is ordinary and inevitable. But what he should aim at, I think, is to make every point he has chosen so clear, so full, and so germane that the audience could, as a whole, if called upon, reproduce his paper in its entirety, and reproduce it in even a better and more complete form than he has. This, in effect, is for the writer to satisfy himself that, cancelling his previous knowledge, he could from his own paper learn all it was necessary to know of the subject.

Questions which the writer should steadfastly keep in the background are "What does my audience think of Me?" "Am I doing myself justice?" "Quite unimportant and irrelevant, for it is your production they are thinking of and not yourself. For, a candle, in itself, attracts little attention at any time, but when lighted, is lost sight of altogether by reason of its illuminating power. "Have I done justice to the intelligences of my audience?" is, as Falstaff would have said, "a question to be asked."

THE PUPIN SYSTEM APPLIED TO AERIAL TELEPHONE LINES.

(From Dr. EBELING'S paper, concluded from page 162.)

Lines with Double Coils.

WHEN single coils are employed special apparatus must be erected on the A and B lines, that is to say that two apparatus are requisite at every coil-position. With double coils, on the other hand, each coil-position only requires a single apparatus, because the same iron core serves for the two windings of the A and B lines. As one would expect double coils to be less costly to construct than single coils for each coil-position, and the symmetry of the A and B lines to be better maintained with the double coils than with the single coils, the Siemens & Halske Company decided to make a trial to determine principally if such coils sufficiently resisted lightning. The values of the windings of the coils remain the same when the two windings are made exactly alike, even in the case of strong magnetisation on one side; this is proved by measurements made by Herr Nowotny on some double coils supplied by the Siemens & Halske Company to the Austrian Ministry of Commerce.*

First Trials with Double Coils.

As it was chiefly desired to determine in the trials of the double coils if storms produced frequent disturbances, it sufficed to make the trial on a line of short length. The Berlin-Magdeburg line, which traverses a very stormy region, being very suitable for such trials, the Siemens & Halske Company asked permission of the Imperial German Post Office to erect double coils on that line in lieu of the single coils, which were removed. Fig. 13 shows the

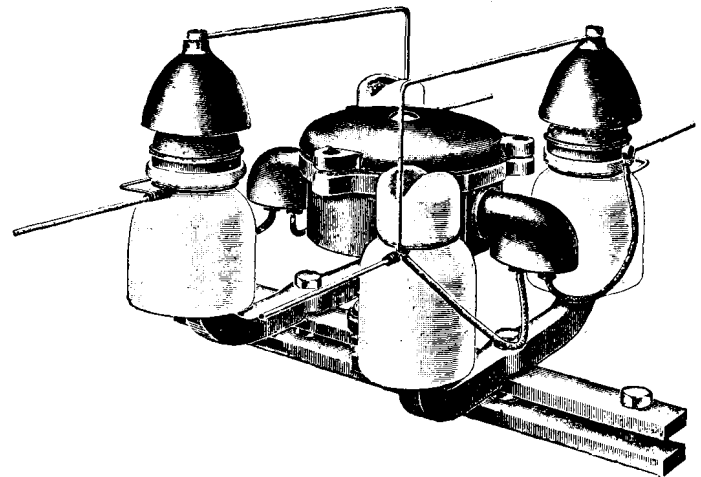


FIG. 13.

apparatus. An iron pot, in which is placed the double coil, carries two outgoing sleeves of ebonite through which pass the wires required for the two windings of the coils. This pot is mounted direct on the iron arm between two double insulators; one of the two insulators of each group carries an arrester. Fig. 14 shows the apparatus mounted on the iron arm.

This apparatus remained on the line for several years and only once was a coil damaged by a discharge of lightning. It must not be forgotten that the first apparatus should be considered as very primitive, and this single case might not have occurred had the construction of the apparatus been more perfect. In

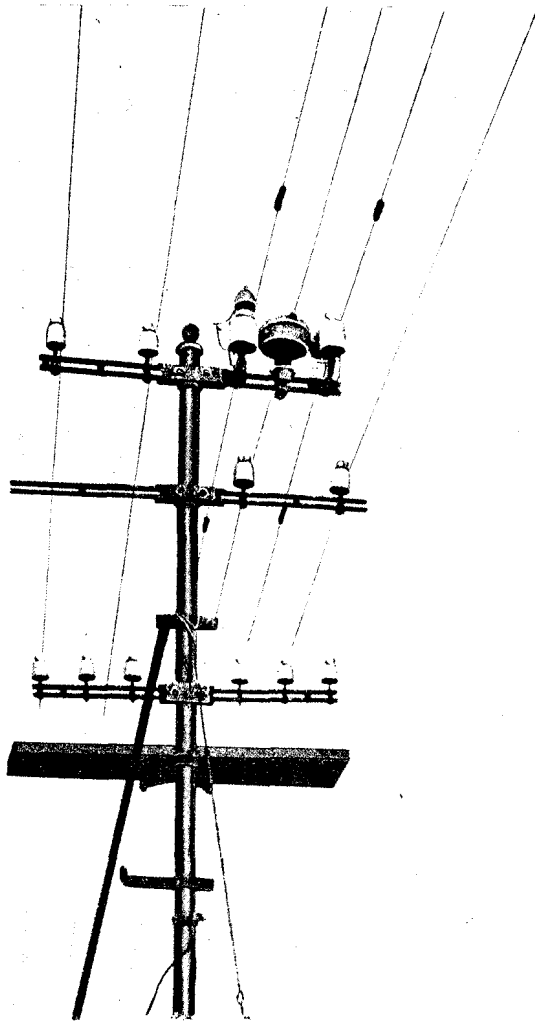


FIG. 14.

consequence of these results several telephone lines were equipped with double coils.

Double Coils in Metallic Box.

The Prussian Railway Administration has employed on a large scale double-coil apparatus with adapted arresters; these have been in service about two years without any fault arising and have given excellent results. In a region where violent storms occurred in the summer of 1908, no coils or arresters were damaged, so well the latter did their work. Fig. 15 shows the complete

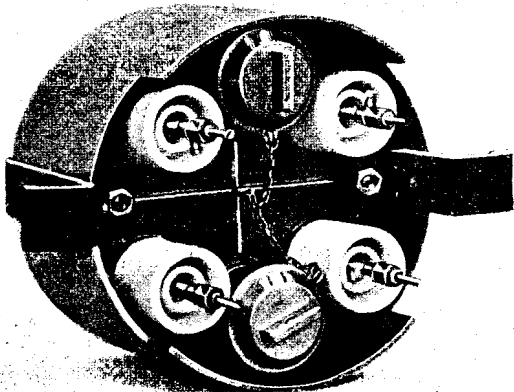


FIG. 15.

apparatus with its different parts. Fig. 16 shows two sets of apparatus of this sort mounted on iron arms for double wire lines.

The Austrian Ministry of Commerce has also had some lines equipped with double coils and Herr Nowotny has published some information in reference thereto.* In all cases the expected increase in sound volume was obtained.

We will not stay to speak here of the different pupinised lines fitted with more recent types of apparatus, for various reports will doubtless be published relating to each of these lines. We confine ourselves simply to the remark that the pupinisation of telephone lines has already been carried out or is actually being carried out in several parts of Germany, and several other countries, and that even in the tropics a long line on this system is in course of construction.

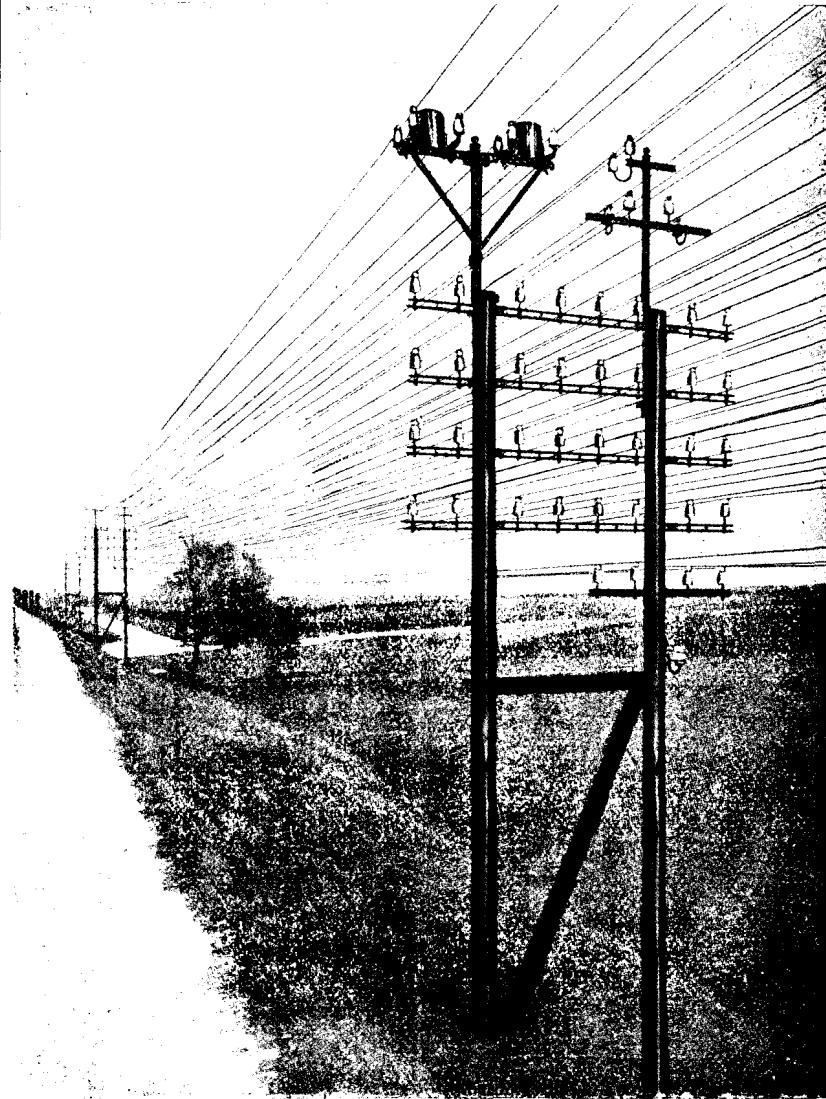


FIG. 16.

Economic Value of the Pupin System.

The result of the preceding is to show that the employment of the Pupin system on aerial lines has given good results in every case as regards improvement of speaking; the mechanical difficulties may also be considered as overcome by the employment of later types of apparatus, constructed in accordance with the results obtained from experience. To show the economic importance of the Pupin system to aerial lines we will give an example. Suppose we are dealing with the pupinisation of a 3 mm. bronze line. The coil-spacing will be 8 km., for the trials made by the Austrian Ministry of Commerce† have shown that aerial lines need

* *Elektrotechnik und Maschinenbau*, 27, 1909. *E.T.Z.*, 1909, page 357.
 † *Zeitschrift für Elektrotechnik*, 1905, 13.

not be so highly pupinised as was at first done. Under these conditions, an aerial line of 3 mm. bronze on the Pupin system will be as good as a bronze line without coils of at least 5 mm. Reckoning broadly and taking into account the reflection effects, which are produced when ordinary lines are connected to a Pupin line, and which cause a certain diminution of capacity, it may be allowed that in all cases the capacity of the pupinised line is equal to that of an ordinary line of 4.5 mm. wire. Allowing the price of bronze wire to be M. 1.70 (1s. 8½d.) per kilogram (2½ lbs.), which is not far from the average price, and supposing the price of the wire to be proportional to the cross-section, we shall have:

Price of 1 km. of double wire bronze line of 3 mm., about M. 220 (say £11).

Price of 1 km. of double wire bronze line of 4.5 mm., about M. 500 (say £25).

That is to say, an economy of M. 280 (£14) per kilometer on the price of the wire; the price of the coils must be deducted, which is about M. 50 (£2 10s.) per km. The kilometer of 3 mm. pupinised line will then cost M. 270 (£13 10s.), and the saving in comparison with a 4.5 mm. line is M. 230 (£11 10s.) per km. It may be said that a Pupin line costs one-half of an ordinary line. In the case of a 5 mm. line, the price of which is about M. 620 (£31) per km. of double wire line, and the capacity of which is generally attained by a pupinised wire of 3 mm., the saving is M. 350 (£17 10s.) instead of M. 230 (£11 10s.).

Suppose we are dealing with a line of 600 km. we have:

Price of 600 km. of double wire line of 5 mm., M. 372,000 (£18,600).

Price of 600 km. of double wire line of 4.5 mm., M. 300,000 (£15,000).

Price of 600 km. of double wire line of 3 mm., M. 162,000 (£8,100).

Saving as compared with line of 4.5 mm. pupinised, about 138,000 (£6,900).

Saving as compared with line 5 mm., about M. 210,000 (£10,500).

According to the preceding, the aerial lines on the Pupin system require no more maintaining than an ordinary line now that the faults of the first apparatus have been avoided in the new types; in these circumstances there is nothing to be set against the enormous economic advantages of the Pupin system for aerial telephone lines.

THE RELATION OF THE ENGINEER TO THE TELEPHONE INDUSTRY.

BY FRANK F. FOWLE.

(Concluded from page 165.)

We might go on almost indefinitely to point out the need of engineering and the consequences of a lack of it. But those who are interested in the subject, and it is to be hoped that this includes owners, managers and manufacturers in the industry generally, should read the paper prepared by a well-known engineer, Mr. Kempster B. Miller, on "Economy of Proper Engineering," presented at the 1909 convention of the International Independent Telephone Association. That paper is well worth the careful attention of every owner and manager who is sceptical about the value of sound engineering; the conclusion which was there forcefully pointed out may well be repeated here, in substance. Permanent success in the industry demands that a broad-gauge business policy and a broad-gauge engineering policy shall go hand in hand; they are mutually dependent and inseparable. The Independent companies cannot hope to become permanent institutions if they proceed in ignorance or violation of correct engineering principles.

For the benefit possibly of some who are unfamiliar with the practical side of the engineer's work, and the manner of his occupation, the closing section of this article will be devoted to a description or classification of engineers by occupation, with some explanatory comments.

Classification of Engineers by Occupation.

The functions of the telephone engineer are so numerous and diverse, that it is difficult to group them so as to show fully the many lines of engineering occupation in the industry as a whole. Yet it is possible to show the typical or well-known branches. This has been attempted in Fig. 2.

ENGINEERS ..	CONTRACTING ..	Engaged in the business of plant construction under contract.
	OPERATING ..	In the regular employ of operating companies, and engaged in construction and operation.
	CONSULTING ..	Publicly offering their services in the general practice of engineering.
	MANUFACTURING ..	In the regular employ of manufacturing companies.
	SALES ..	

FIG. 2.—CLASSIFICATION OF ENGINEERS BY OCCUPATION.

There are five typical branches of engineering occupation in the telephone industry; these are Contracting, Operating, Consulting, Manufacturing and Sales. These divisions are of a general character, and each embraces a number of specialties or distinct lines along which some engineers have devoted a great deal of their time. And there are numerous instances where engineers are so engaged as not to fall wholly within any one category of Fig. 2, an example of which is the case of individuals or firms which combine consulting and contracting.

The contracting field is of course pretty well understood, according to its definition in Fig. 2. There are numerous individuals, firms and companies who make a business of bidding for construction work of all kinds, under contract. Hence the term contracting engineer. There are several specialties in this field, which include exchange, cable, pole line and subway construction, etc. Those who specialise and those who do not so specify, as a rule, in some manner.

The operating field embraces practically the whole range of engineering except manufacturing. The larger companies usually have engineers in their employ in some capacity. The scope of the engineer's work depends, of course, upon the particular form of organisation under which he serves. The very large companies frequently have engineers in the different departments; sometimes these companies have engineers in executive positions. There is no doubt that the engineer possessing the natural temperamental qualifications and who has had a proper course of practical training and experience makes a business man of the highest type. But at the same time it is almost impossible for an executive officer to handle the problems of management and those of engineering, keeping fully up to date meanwhile in all branches of the business. In general it may be observed that the engineer of an operating company is valuable in nearly the same proportion that the business policy is of a broad-gauge character and the management places confidence in him.

The smaller operating companies cannot usually afford to employ an engineer regularly. This is a field which needs especially the benefits of engineering, and has too rarely enjoyed them. The problem for such companies can be readily solved in several ways. They may band together for the purpose of employing an engineer, individually or through their State Associations; or they may employ a consulting engineer from time to time as needed. There is no insuperable difficulty or excessive expense involved in any of these plans, and the benefits have already been elaborated upon. There is no doubt that the smaller companies have, in many cases, dispensed with engineering because of the belief that it could not be afforded. There should be every effort among engineers to correct this misapprehension, and educate these companies in the economy of engineering and the means of obtaining it.

The consulting engineer usually covers the whole field except contracting and sales engineering. His services are offered alike to all. In some cases consulting engineers have specialised along particular lines, but the telephone field has not yet warranted this to any considerable extent. The ethical rules of professional

practice must be carefully observed. It is a cardinal principle that a consulting engineer must serve the interests of his client exclusively and faithfully; he cannot accept a fee from more than one party at interest in a transaction, unless it be by mutual agreement and request; he cannot accept as a client any one whose interests will embarrass the fulfillment of his obligations to other clients whom he is serving at the time; he must preserve careful secrecy in regard to a client's affairs; and he cannot honourably seek to have other engineers dismissed in order that he may be engaged in their place. It is as necessary that consulting engineers shall abide by the ethics of their profession as it is for doctors and lawyers; they cannot otherwise maintain professional standing. A very carefully drawn code of engineering ethics has been proposed and discussed by the American Institute of Electrical Engineers, which will interest all who have occasion to employ engineers in any capacity.

The services of consulting engineers are available to all operating, manufacturing and construction companies in the industry, in connection with any engineering question or problem. Their services are also available to banks, trust companies and investors for the examination of telephone properties to ascertain cost, value and earning power, from an investment standpoint. They are also called upon frequently to make appraisals and rate investigations, and perhaps to give expert testimony before courts or rate commissions in regard to such matters. Consulting engineers can be of value especially to those smaller operating or manufacturing companies who cannot afford to have experienced engineers in their regular employ, and whose needs can be met without the expenditure of much time. It is probable that the State Associations could organise engineering bureaus for the benefit of member companies and, with the aid of consulting engineers, disseminate a large amount of practical and useful advice upon numerous engineering matters affecting construction and operation.

The manufacturing field has been pretty well covered already. In recent years there has grown up a special field in this line known as sales engineering, which should be mentioned in closing. The keenness of competition among manufacturers has developed the need of engineering qualifications in salesmanship; and inasmuch as engineering salesmen are not ready-made or easily obtainable, it has come to be the practice among the larger companies to assign an engineer to the sales department. His duties are to study the demands and needs of operating companies and to present the technical features of his equipment or product to interested persons or probable purchasers. It is also his province in some cases to assist a purchaser with regard to his installation, in preparing plans and specifications, and, perhaps, supervising the work. The sales engineer cannot become a substitute for the consulting engineer in his relation to the purchaser, because he is employed by the other party at interest in the transaction. Of course he may become so in effect, possibly, if the purchaser is satisfied that his own interests are protected. But here, as in all other situations, the purchaser or owner is the one who derives the benefit of sound engineering and with whom rests the final responsibility of providing it.

CAB ORDER TELEPHONES.

By A. C. GREENING.

INCLUDED in a postcard series labelled "London Types," a foreign stationer displays Phyllis, neatly attired, and with trim figure set off by the daintiest of caps and aprons, engaged in whistling for the elusive taxicab. While doubtless by no means adverse to filling at times the public eye, or illustrating for stay-at-home foreigners attractions to be seen in the flesh at the expense of a little travel, there are moments when the maid's preference must lie in the direction of calling cabs from within a warm interior, rather than performing with variable success upon a wind and rain-swept doorstep.

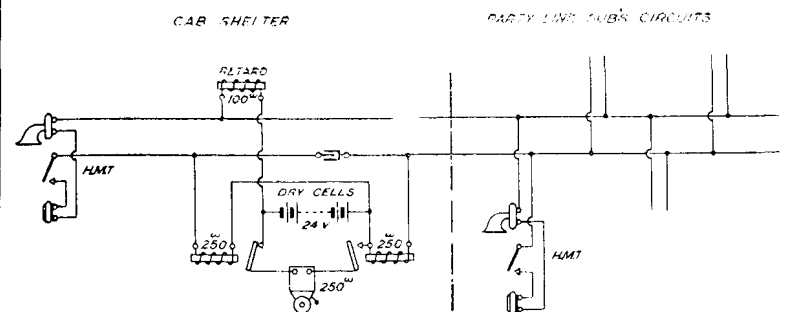
The telephone, with its usual adaptability to human requirements not only supplies the alternative, but, due to its more direct methods, frequently suppresses the whistler altogether, much to the contentment of every neighbour not requiring a cab at the

moment. Cab order-wires operating direct into cabmen's shelters have long been a Metropolitan feature, ranks serving such well-known residential areas as Regent's Park, Maida Vale and Belgrave Square being thus equipped. The accompanying diagram of the circuit employed may interest a reader to whom it is novel.



Simplicity is the characteristic note, depression of the hand-set key being all that is necessary to send or receive a call. A few clubs have found it convenient to be connected direct to the nearest shelter by a private wire, and the Post Office exchange service is installed in a few of the better known shelters.

CAB ORDER WIRE.



The innumerable cab ranks not possessing shelters have, so far, not been catered for, and a calling service via the Kensington Exchange brought into use by the recent attachment of a telephone to a lighting standard at the junction of Kensington and Melbury Roads will, as an experiment, be watched with interest by telephone men, drivers and the travelling public. The telephone, as illustrated, is of weatherproof construction, is served by overhead wires, and possesses a bell large enough to give a call audible throughout the length of the rank.

THE PSYCHOLOGY OF THE OFFICE.*

By J. F. SCOTT, Glasgow.

"The old order changeth and giveth place to the new." The haphazard bookkeeping of the small trader has become the complex system of the huge composite company. The despised individual, who became a clerk mainly because of his lack of intelligence, is rapidly being replaced by the latter day adept whose speciality is, or should be, brains. Bookkeeping has become an art, and organisation a science.

At first consideration these statements appear more trite than accurate, but an examination justifies their use. In modern business the office distributes the work to other departments, gathers together their energy in concrete form, and realises the results. It is the regulator and recorder of all efforts made, the means whereby the financial success or failure of any venture may be known. It is that equivalent to the force of gravity which knits and holds together the organisation. Only by the perfecting of its methods has the huge nature of present-day enterprises become possible.

In approaching our own Company's commercial scheme we must not only know these general principles, but also the special conditions in which we move. Before the present artificial restrictions were imposed, the business of the National Telephone Company was in a continuous state of development which nothing short of a national calamity seemed likely to suspend. New systems were adopted, new facilities given, and each adjunct required special treatment; interests and responsibilities grew greater and demanded keener surveillance; and so it is that in office work, in order to cope with the fresh conditions, there has been built up by slow degrees a ponderous system of checks and counter-checks, of locks and inter-locks, of wheels within wheels, each planned to work in as nearly perfect unison with the whole as might be expected of additions and adaptations. For some time we have subconsciously viewed its intricacy with admiration; we have marvelled at its mechanical means of checking human inaccuracy; but the lamentable thing is that, as a staff, we have not yet gained that advanced attitude of mind which asks, intelligently, "IS IT ALL NECESSARY?"

In all evolutions there is a gradual growth from crudeness to intricacy, and then an intelligent reaction to simplicity when the essentials have been grasped. Our commercial system is in the intermediate or complex stage, and where there is much involved mechanism there is of necessity a liability to friction and discord. These it must be our task to eliminate or at least reduce, and the method has to be chosen. Either the complexity must be cleared, lock, stock and barrel, and replaced by a uniformly planned machine or the materials of which it is composed must be improved and the adjustment and oiling of each part perfected.

The machine may yet require to be remodelled from its foundations, but it would be an heroic task and therefore impolitic of advocacy in these closing years of the Company's licence. We turn therefore to the alternative—the improvement and adjustment of the materials, or, to dispense with the simile, the human element.

The system is complex; but there is nothing more startling, and at the same time edifying, than to examine this complexity, and make the inevitable discovery that much more is due to human inefficiency than to ill-planning of the basic scheme. We have come to regard a fair harvest of trouble as only to be expected; we have become so accustomed to jars caused by errors in tact, method, or omission, that we have almost ceased to regard them as such—in fact some of us are perilously near that frame of mind which marks the death of progress by believing that all is as well with our world as can be. This appears exaggeration, but its truth will be manifested later.

We are led to a statement. The result of any enterprise ultimately depends on the quality and attitude of the minds engaged

in it, and where these are defective, no system, however admirably planned, can be fully successful. *Our malady is a disinclination to probe further into matters than immediate necessity obliges us.* If we eliminate the apathetic condition of mind which is the root cause, we cure the disease.

First, however, we must give the patient conditions favourable to recovery, and this brings us to the consideration of *the employer's duty to the clerk.*

One scarcely expects to reap wheat where thistles have been sown, or to raise roses in a frosty atmosphere; and just as little can an employer expect to rear an efficient clerk unless he choose the proper material and supply the proper environment.

Let us engage our clerk. It has been the custom here in Glasgow to engage lads direct from school, and to train them in the sub-departments of our offices. A better method of giving the neophyte a comprehensive knowledge of the peculiar nature of telephone accounting has yet to be devised. It is also the custom to test very carefully the capabilities of applicants, and the necessity for this cannot be urged too strongly. Before an engagement is made there should be a thorough conviction that the raw material has every quality that will be called for, and it is well that the preliminary examination, rightly given in our offices, be rather too difficult than too simple. This for two reasons: first, that the company has no right to waste the time of a lad, who, though ill-suited for its necessities, may prove apt and smart at another calling; and second, that it is bad business to waste time in endeavouring to train unsuitable material. If then an employee fail after selection—with certain exceptions, where the reason is evident—the blame should be ascribed to the officer who made the choice.

The suitable clerk once obtained, the Company's duty to him does not end there. It pays to have a contented employee, one who is confident that his work is appreciated, and so realises that his future is identified with that of the employer. We have little to complain of in this respect, but there should be continual vigilance exercised in order to distinguish those American methods which are praiseworthy and desirable from those which are eminently undesirable. If the enthusiasm of the American telephonist be as real as our reports show, then it must have been fostered on the first and not on the second part of the famous war cry, "Get on or get out!" It would not have conduced to the safety of Blondin to hear behind him the voiced warning that Niagara was fierce and deadly; and surely in these competitive days it is unnecessary to warn us of the all too apparent dangers of failure. A few judicious words of appreciation or encouragement are more valuable in effect than a thousand threats: the former stimulate to higher voluntary service, while the latter goad to what is necessary, but no more. To put it in lighter vein, the whip never moved the stubborn donkey, but the bunch of carrots worked wonders. In our case the carrots should not, like the mirage, be a visionary show which the traveller never gains, but should resolve themselves into tangible entities equitably distributed.

So much for the recognition of merit, but a more difficult task is the appreciation of the true value of errors. Mighty consequences may follow a slight omission, but the extent of the condemnation should be gauged by the circumstances which gave rise to the mistake, and not by its results. There are, of course, some heart-breaking cases where nothing short of physical violence seems to impress: but justice, tinged with leniency, is generally more politic, for the real mission is not to terrify the culprit, but to get him to realise his error and rise above it. The departmental chief should not see everything: there are times when a man should be left to work out his own salvation. To censure for each slight misdemeanour will undoubtedly weaken the effect when a really severe reprimand is incurred.

There should be a feeling of friendship between a chief and his juniors. The extending of sympathy does not mean the sacrifice of dignity, and he who maintains the contrary convicts himself of weakness. So far as duties will allow, each man should be given opportunity to perfect his knowledge of all branches, if for no other reason than that the Company will also reap the benefit.

In justice it must be allowed that our conditions more nearly approach this ideal environment than do those of most businesses

* Paper read before the Glasgow Telephone Society, and awarded the first prize by the Company for a paper on "Office Work," 1909-10.

of a like nature; but it is so far insisted on because we cannot remain satisfied with the survival of the fittest—all must at least have opportunity to become fit. Given these favourable conditions, the clerk who fails need look no further than himself for the reason.

Following natural sequence, we now proceed to consider *the clerk's duty to his employer.*

Here we approach what should prove a more pleasant theme, for the duty of the clerk to his employer and his duty to himself are synonymous; the welfare of each is dependent upon his exertions. The sequel aspires to show in what manner these exertions fail.

First, however, we must recognise that a broad difference exists between clerical and technical work. As a general rule there are few deviations from recognised methods in engineering and electrical work, and accordingly a thorough knowledge of certain clearly defined subjects and a dexterity in handling tools are the first essentials, the possession of these enabling the ordinary workman (mark—the ordinary workman) to perform his duty satisfactorily. The addition of a thinking mind is certainly the lever which raises its owner and should be striven for; but its absence in the rank and file may be compensated by frequent recourse to plans and diagrams, and is not therefore unduly apparent.

In office work, on the other hand, knowledge, though a prime necessity, is subservient to mind-power or judgment. The broad basis of the work may be learned by a zealous student in a few days, but when this has been accomplished only a very minor step has been taken towards the making of a good clerk. No matter how obscure our clerk may be, in his work there continually arise special cases which demand the exercise of original intelligence, and he speedily discerns that Service Instructions are merely an inadequate framework around which the individual must build a constantly changing structure. Each clerk's duty is distinct in nature from those of his *confrères* and for the time being he is its specialist. He has in his hands the opportunity of materially assisting others or of causing them endless inconvenience. An engineer or electrician may complete the work partially carried out by another, but, unless the threads have been carefully gathered together, one clerk cannot at a moment's notice supersede a colleague without inevitable miscalculation and misunderstanding.

The appreciation of these facts in conjunction with the importance of office functions leads one to the decision that the clerk is a greater potentiality than he yet knows, and that, since he lacks this realisation, he is less potent than he should be. He undoubtedly fails in quality, not in kind. This is the malady of which we spoke, a malady whose existence may be made manifest by citing an instance.

Some years ago there was arranged a system for carrying out a certain piece of work, comparatively simple and unimportant in itself, but whose neglect would have grave consequences. Let the system be imagined as a small chain, the links being the several clerks who were concerned in it. An error occurred, and, its seriousness being observed, a check on this part of the chain was immediately added—in other words, the single link was replaced by a double one. The chain was subsequently broken down at every possible place, and, although it is now at least double-linked in every part, he would be an optimist who, in face of past experiences, would guarantee immunity from further trouble. Let it be noted that there is nothing wrong with the system; the blame lay with those whose duty was to perform the work. This case is flagrant, but its counterpart would not be hard to find. Too often there is the lackadaisical idea that, if only the work is done, the manner of doing it is of little moment; too great attention is paid to precedent; the exertion of thinking an original thought, and so creating an improved method, seems to be beyond many of us. And the reason for all these shortcomings is the lack of an intangible something, which may be defined as "*active intelligence.*" It is just the presence or absence of this quality which causes the difference between what a clerk should be and what he too often is; he may as a thinking power have an incalculable effect, or he may sink to the level of a mere automaton.

Looking further into the matter, we find it to be simply a case of buried talent, for assuredly none would be brought to admit himself incapable of its exercise. Every clerk when promoted to a

new position keeps his eyes and ears alert until he has gained mastery of the methods. His routine work becomes second nature, and he is able to perform it mechanically, without conscious function or thought. This is the crisis. Many relapse into a state of apathy, believing without consideration that the ultimate goal has been attained; and, if further promotion does not come so quickly to them as to their more energetic colleagues, they blame some vague injustice which they cannot coherently explain.

The antithesis of this is the correct attitude. The clerk worthy of the name must maintain his original alertness. The fact that his routine work is now second nature should make him free to discern the "Why?" of things. No item which gives the slightest suspicion of inaccuracy should pass his hands till a scrutiny has justified it. Though primarily responsible for his own work, he must also hold himself answerable for the proper handling or reporting of any deviation or inaccuracy which may come within his knowledge. The supreme ideal is the worthy attainment of a reputation for infallible accuracy and thoroughness.

The disease exists; and its cure, the possession of this active intelligence, would not only enhance the individual's worth and consequent promotion, but would also rid the office of its greatest curse—the mistake. It is not too much to say that half the friction between subscriber and Company, and more than that proportion of our internal discords are due to preventable errors. The employer has been asked to deal lightly with these, but it is certain that no clerk can be too harsh in his condemnation of himself. The three most flagrant species of error are those of judgment, of omission and of carelessness. Judgment is dependent upon the development and experience of the individual, and errors of this nature may be dispensed with in an exhortation to think well before acting. The other types are inexcusable, and cannot be condemned in the abstract too strongly. Those of omission are due to lack of method, and the clerk without method, is like a ship without a rudder—adrift and lost. The captain who set out in such a ship would be characterised as a "culpable idiot"—the methodless clerk may be left to apply the necessary expletive to himself.

The most common error of all, however, is that usually described in our officials' dealings as "inadvertent": or, in plainer language, the result of negligence. It can only occur where the mind is wandering to other, perhaps more agreeable, topics: when, to take a case in point, the work is being carried on concurrently with a discussion on sport or fashion. Lack of concentration is the undoubted invariable cause, and this cause is the hardest of all to uproot. There is but one cure—one easy to explain but difficult of continual application—to confine the attention wholly to the immediate work in hand.

Assuming that our clerk has realised the necessity for this active intelligence—this wonderful elixir which is to transmute his partial effectiveness into ideal usefulness—his next step must be the gaining of knowledge. First he must see to it that he understands the framework of the Company's bookkeeping, and especially in what respect each official return hinges on and affects the others. It is no uncommon occurrence for one clerk to make an adjustment in a manner which, although setting his own house in order, throws out of gear that of a colleague, when a little understanding, coupled with a little thought, would have clearly discovered the correct method. And the guilty parties are not always amongst those of slender experience.

In reviewing the subjects with which a clerk must have acquaintance we meet a curious diversity of opinions. Our easy-going friend asserts that, given a knowledge of the "three R's," he requires no further stock-in-trade than his intelligence. The ambitious man, on the other hand, finds to his dismay that there is scarcely one subject he can afford to disregard—scarcely one which will not possibly be called for if his ambitions are to be realised. The question is so wide and has been so fully dealt with in the JOURNAL that it would avail little to expand here. There is one pitfall, however, of which it may be well to give caution. The test of knowledge acquired is the value of its application. Many minds are like the valve of a pneumatic tyre—they have a wonderful capacity for drinking in, but there is no outflow. The clerk is judged by on his outflow, and he must therefore be careful to see that his study makes not so much for erudition as for practical utility.

(To be concluded.)

TELEPHONE WOMEN.

LXXX.—HELEN P. WEIR.

MISS WEIR, Chief Operator at Dumbarton, entered the Company's service in June, 1889 (although to judge by her appearance she must have been almost too young for business at that time), as sole operator in Dumbarton Exchange. There were very few facilities then for the training of operators, so that the subject of our sketch was left to pick up her duties in a somewhat haphazard fashion: and although the traffic was comparatively light, the conditions and working apparatus were so different that an operator required to exercise a great deal more patience than is called for nowadays.

Miss Weir has served under seven district managers, all of whom can testify to the ability, tact and sound common sense with which she has discharged the numerous duties pertaining to her



HELEN P. WEIR.

position. For the last year or more she has from time to time acted as Travelling Supervisor in the Dumbarton and Oban centres, and has proved very efficient in that capacity.

LXXXI.—MINNIE SLEEFORD.

MISS SLEEFORD, the present Chief Operator at Chatham, entered the Company's service in that town in March, 1897, and has spent the whole of her business career in the telephone service. At that time Chatham was in the Canterbury district, but shortly afterwards the districts were reorganised and a district office created at Maidstone.

The switchboard in use when Miss Sleaford joined the service

was of the single cord pattern with transmitters suspended in front of the operators, and all lines were earth circuits.

In 1906 an extensive underground system was carried out, and the whole of the subscribers from Strood sub-exchange, which was



MINNIE SLEEFORD.

closed, were transferred to Chatham. In the same year a new 300-line switchboard section was added, making a total equipment for 630 direct lines and 48 junctions, and the switchroom, which is now considered the most spacious in the district, was extended.

Miss Sleaford is of a kindly nature, is very popular amongst the staff, and has shown considerable tact in dealing with difficult subscribers. She takes an active part in religious and social work and is a Sunday School teacher at St. Nicholas Church, Rochester, her chief hobbies being walking and reading.

It may also be added that Miss Sleaford has served under four district managers and five local managers.

DEATH OF MR. R. GILMOUR.

WE regret to announce the death of Mr. R. GILMOUR, District Manager, Edinburgh, which took place on the evening of Saturday, Nov. 19, at his residence, Belgrave Road, Corstorphine. He was at business that day, and left his office apparently in his usual health. In the afternoon, however, whilst conversing with his wife and son, he was suddenly taken ill, and died later in the evening without recovering consciousness.

Mr. Gilmour, who for some time had not enjoyed good health, was born at Paisley in 1865, entering the telephone service at a very early age. He was District Manager at Belfast from 1896 to 1909, when he was transferred to Edinburgh on account of his health. His portrait and biography were published in the JOURNAL in June last.

The funeral took place on Nov. 23 and was attended by the Scottish Superintendent (representing Mr. Goddard, General Superintendent), Mr. Fulton (representing Mr. Gill, Engineer-in-Chief) and by a large number of the Edinburgh staff. Amongst many beautiful wreaths were those from Mr. Goddard, Mr. Watson, the Engineer-in-Chief and his staff and the Belfast and Edinburgh staffs.

A YEAR'S GROWTH OF THE TELEPHONE.

BY W. H. GUNSTON.

If any apology were needed for returning to this subject it is to be found in the fact that the statistics of telephone development in the world are far from being of merely academic interest; and to us in England, debarred by strange handicaps and capricious reversals of policy from attaining our fullest development, the enormous expansion of the telephone system in some countries, together with its causes, and the failure to make progress commensurate with the importance of the country in others, are full of significance and instructive lessons. Recent statistics of telephone development are notoriously difficult to obtain. In countries where telephone companies are numbered by the thousand or hundred, as in the case of the United States and Brazil respectively, the task is impossible. A recent Government census in the one case, and some enquiry as to the larger systems in the other, enables us to get sufficiently approximate figures. The articles published in the JOURNAL last year gave the most complete statistics of the kind that had hitherto been published, and that considerable interest is being displayed in such figures is evidenced by the fact that since their publication Herr von Hellrigl has published a similar statistical article in *Electrotechnik und Maschinenbau*; and, from a source which I have not been able to trace, paragraphs on the same subject (to which reference was made on page 32 of the present volume of the JOURNAL) appeared in the general Press last spring. Lastly, the American *Electrical Review* of June 25 last published a comprehensive article on "The Telephone Industry of the World," which it claimed as the most complete and interesting *resumé* of the kind that had ever been published.

There will be nothing unexpected by our readers in the demonstration that this country is not keeping pace in rate of development with some of its rivals. So important a part is the telephone playing, and so increasingly vital a part is it destined to play in commercial progress that the proper development or otherwise of the industry must infallibly leave its mark in each country (in the shape of increased vigour or decline) on that progress in so far as it relies upon this most efficient and rapid of all means of communication. Much has been said in the JOURNAL and much more must be said of the necessity for Great Britain to go full steam ahead in telephone development. While the telephone is marking time, not only is its development in this country lagging behind that of others—a matter of great national importance but urgently necessary work is being withheld from the employable.

Unless otherwise denoted the following figures refer to Jan. 1 in each year. Much later figures could of course be given for Great Britain, but for purposes of comparison the development up to Jan. 1 last has been taken all round.

EUROPE.

Great Britain and Ireland had 601,269 telephones in 1910 as against 565,854 last year, the number of inhabitants per telephone being 68. Of these 503,643 were on the National system, 92,626 on the Post Office and about 5,000 in the two extant municipal systems.

The following are the principal urban systems:—

	1910.	1911.	Population per telephone.
London	104,208	181,011	36
Glasgow	43,928	42,855	24
Liverpool-Birkenhead	26,849	27,783	37
Manchester-Salford ...	21,209	23,462	47
Birmingham	13,479	14,336	64
Edinburgh-Leith	10,889	11,791	44
Hull	10,800	11,060	24
Leeds	9,072	9,365	55

Germany, with 940,966 telephones as against 851,319 last year, is fractionally better than this country in its proportion of population to telephones, which is 65. The development of the principal towns shows Berlin 111,751, Hamburg 53,580, Munich 24,972, Frankfurt-on-Main 20,932, Leipzig 20,682, Dresden 18,104, Cologne 17,471, and there are six others with over 10,000 stations.

France has 211,728 stations as against 194,159 in January, 1909,

and the number of souls per telephone is 186. The largest systems are Paris 69,205 telephones, Marseilles 5,975, Lyons 5,283, and Bordeaux 4,137.

Sweden has 179,174 stations (114,734 State, 54,440 company) as against 158,503 last year. The average number of inhabitants per telephone is about 30. Stockholm has 66,669 stations, Gothenburg 11,241, and Malmö 6,018.

Austria-Hungary.—The total number of telephones in the Austro-Hungarian Empire last January was 144,684 (over 250 inhabitants to every station) as against 124,825 last year. The administrations in the two component countries are, however, distinct. Austria numbers 94,978 telephones (of which in Vienna there are 41,070, in Prague 6,314, and in Trieste 3,379) and Hungary 49,706 (of which 12,377 are in Buda-Pesth).

Russia.—The latest official figures received are for January, 1909, when there were 112,885 stations in existence. They may now be put at about 127,000, or one for every 1,022 of population. The number of stations in St. Petersburg is 27,619, in Moscow 26,140, and in Warsaw 18,979.

Denmark.—The figures in the official annual are given in subscribers' lines. The Copenhagen Telephone Company give the total number of stations in Denmark at the beginning of 1909 as 78,233 and at 1910 as about 86,000, or one for every 30 inhabitants. Denmark thus fairly shares with Sweden the first place in Europe for proportionate development of telephones. Copenhagen and suburbs have 40,474 stations.

Switzerland has 73,758 stations, as against 69,122 last year—i.e., one for every 47 inhabitants. Zurich has 10,250 telephones, Geneva 6,750, Basle 6,015 and Berne 4,005.

Italy has 62,266 telephones, as against 53,721 last year. Milan has 9,886 stations, Rome 9,014, Genoa 4,907 and Turin 4,063. Population per telephone, 552.

Norway had 58,026 telephones in 1910 and 53,726 in 1909. The present development is therefore one telephone to every 39 inhabitants. The latest figure for Christiania (the largest town) is 15,535 at the end of June, 1909.

Netherlands.—There are 52,635 stations in Holland (of which 30,904 are municipal, 16,185 private companies and the rest State), as against 47,421 last year. Amsterdam has 11,761, Rotterdam 6,669 and the Hague 7,015 stations. The number of inhabitants per telephone is 113.

Belgium has 42,540 telephones, as against 38,503 last year, a proportion of 167 inhabitants to every telephone. Brussels has 15,042 telephones, Antwerp 5,850 and Liege 4,001.

Spain has 20,855 telephones, or over 900 people per telephone. Last year there were 18,462 stations working. Madrid has 3,131 telephones and Barcelona 4,210.

SUMMARY OF EUROPE.

	January, 1909.	January, 1910.	Percentage of increase
Germany	857,319	940,966	10.5
Great Britain	564,400	601,269	6.5
France	194,159	211,728	8.3
Sweden	158,503	179,174	13.3
Austria-Hungary	124,825	144,684	16.1
Russia	112,855	127,000	13.
Denmark	78,233	86,000	10.2
Switzerland	69,122	73,758	6.7
Italy	53,721	62,266	16.
Norway	53,726	58,026	8.
Netherlands	47,421	52,635	10.7
Belgium	38,503	42,540	10.5
Spain	18,462	20,855	13.
Roumania	10,520	12,000	—
Portugal	4,975	5,468	12.2
Luxemburg	2,902	3,100	—
Bulgaria	1,930	2,500	—
Servia	1,550	1,750	—
Greece	1,300	1,400	—
Iceland	672	900	—

* Estimated.

There were thus upwards of 2,628,000 telephones working in Europe at the commencement of the year.

ASIA.

The total estimated in the JOURNAL last year, viz., 100,400, has proved to be substantially correct in the light of later official returns. The only Asiatic State where rapid development has been made is in Japan. There were 71,430 stations in this Empire at the beginning of 1909 and 81,447 in July. The total for January, 1910, is therefore about 91,000. There are about 24,000 telephones in Tokio and 10,000 in Osaka.

Making due allowance for the increases in the British and Dutch Indies, the number of telephones in Asia as at Jan. 1 last may be put at 123,000.

AFRICA.

There is little change in the position in Africa. Egypt, Algeria, Transvaal and Cape Colony have the four largest systems. Probably not more than 2,000 stations have been added during 1909, making a total existing at Jan. 1, 1910, of about 27,000.

NORTH AMERICA.

Canada.—Here we have an example of one large company (the Bell) operating 117,539 stations (as against 105,770 last year), and several government systems and independent companies operating the remaining 60,000 odd stations. There were 25,300 subscribers in Manitoba in the beginning of the year, and the total for Canada may be computed at about 180,000 stations. As regards the large cities, there were 27,037 telephones in Montreal, 28,154 in Toronto and 12,717 in Winnipeg.

United States.—The American Telephone and Telegraph Company and the systems in connection therewith increased from 4,634,620 to 5,142,692 during 1909, a percentage of increase of 10.9. The stations of the innumerable companies of the Independents are difficult to estimate, but the figure in the *Electrical Review* of Chicago last July, viz., 7,083,900 stations for the whole of the United States (Bell and Independent Companies) is, no doubt, as accurate as it is possible to attain. This means that there are between ten and eleven inhabitants in the States to each telephone. The Bell Company's development in the large cities is New York, 361,302; Chicago, 207,719; Philadelphia, 105,425, and Boston, 120,769.

Mexico.—The official figure of the total subscribers in Mexico at Aug. 31, 1909, was 16,700. The number of subscribers in the two systems in Mexico City in July this year was about 11,000.

West Indies.—The *Electrical Review* gives 12,600 as the number of stations in these islands.

Total for North America 7,293,300.

SOUTH AMERICA.

The largest systems are those of the United River Plate Company (in the Argentine), the Chili Telephone Company, and the Monte Video Telephone Company. The telephone in Brazil is operated by numerous companies situated in the various towns. The position has not greatly changed since 1909, except for a steady increase in the more progressive States, and the total number of stations on this continent should be about 65,000.

AUSTRALASIA.

No later information has been obtainable with regard to Australia than the figures as at the beginning of 1907 which were used as a basis for the estimate in my article of last year. As regards New Zealand, the number of connections has increased from 26,833 in 1909 to 29,681 in 1910, an increase at the rate of 10.61 per cent.

There are altogether upwards of 80,000 telephones in Australasia.

SUMMARY.

Europe	...	...	...	2,628,000
Asia	...	...	...	123,000
Africa	...	...	...	27,000
North America	...	...	...	7,293,000
South America	...	...	...	65,000
Australasia	...	...	...	80,000
				<u>10,216,000</u>

To the list of cities possessing over 10,000 telephones which was given in the JOURNAL of November last, may be added Hanover (Germany), Zurich (Switzerland), Osaka (Japan), and Mexico City (Mexico).

It will be seen from the foregoing that the percentage of increase during the year in the larger States is as follows:—

Japan (Government)	...	...	29.0
Austria (Government)	...	...	18.4
Sweden (Government and Company)	...	...	13.3
Russia (Municipal, Government, and Companies)	...	...	13.0
U.S.A. (Bell Company and connections)	...	...	10.9
Germany (Government)	...	...	10.5
Canada (Bell Company only)	...	...	10.4
Denmark (Government and Company)	...	...	10.2
France (Government)	...	...	8.3
Great Britain (Government and Company)	...	...	6.5

The high percentage of Japan is no doubt due to that country's having a great deal of leeway to make up, telephonically speaking. In Austria the measured rates must be accountable for the spread of the telephone. In Russia the energetic companies in Moscow and Warsaw have made rapid progress. But in each of the foregoing States it must be remembered that the telephone development has been so low in the past that any noticeable progress sends up the average in a way that would be impossible in a well-telephoned country. The reason for Great Britain's low position in the list is too well known to readers of the JOURNAL to require explanation.

THE PASSING OF THE N.T.C.

BY JOHN S. RHODES.

Old Father Time with sharpened scythe
Is mowing down the years.
The N.T.C., till now so blithe,
Has quickened hopes and fears.
From odds and ends by skilful art
Was wrought a mighty whole,
Which in its glory must depart
And pass to State control.
While "Trunks" had always carried weight
They soon developed more,
So, purchased by a watchful State,
The "Trunks" passed on before.
Though "single" lines were mainly run
'Twas better they were "double,"
Subscribers said—when this was done—
That "twins" gave little trouble.
Old worries had become so great
With aerial wires around,
That cables then—how sad their fate—
Were buried underground.
"Magneto work has had its day"
Runs one of time's decrees.
For under common battery sway
More calls can "pass" with ease.
The cuckoo-egg of "measured rate"—
Hatched in the "flat rate" nest—
Has grown a bird so up-to-date
'Twill soon edge out the rest.
Now if the "transfer's" not a dream
(Or old yield place to new),
Why should an active pension scheme
Be bid a last adieu?
In royalty three million pounds
Was paid into the State,
The staff all helped—and on these grounds:
"Keep pensions on the slate."
In service years the staff is old—
A truth they can't surmount,
'Tis only justice thrice-enrolled
To let "past service" count.

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

Published Monthly at

TELEPHONE HOUSE, VICTORIA EMBANKMENT, LONDON, E.C.

NOTICES.

All communications to be addressed—The Editing Committee, "NATIONAL TELEPHONE JOURNAL," 41, Telephone House, Victoria Embankment, London, E.C.

The Editor will not undertake to be responsible for any rejected MS. All photographs will be returned if the sender desires.

Subscription: To the general public, 4s. per annum, including postage to Great Britain or abroad.

To the Staff, 2s. 6d. per annum, with free delivery to the Offices of the Company. Single copies may be obtained, 3d. each, or 4½d. post free.

For rates for the insertion of Advertisements apply to H. SELL, 167-168, Fleet Street, E.C.

VOL. V.]

DECEMBER, 1910.

[No. 57.]

THE CONSTRUCTION STAFF.

BEFORE these pages are published the staff will have had before them the President's "Memorandum on the continued employment of the Company's Staff on Construction Work," dated Nov. 23. The reassuring statement that the Board has decided to continue canvassing and consequent development of the telephone service for a later period than was previously contemplated, and that unless unforeseen circumstances arise the existing staff will be retained until the end of the license, will lift a heavy burden of doubt and apprehension from the minds of many of the employees of the Company. To have served the Company faithfully for many years and to be within sight of permanent employment by the State, only to lose all prospect of continuous work within the last year of the Company's life, was the hard and unmerited lot which threatened a large number of the construction staff—experienced, capable and well-tried men. And yet, as a commercial concern, the Company was placed in a position with regard to these men of considerable difficulty. Negotiations with the Post Office for the provision of a joint-purse scheme to enable construction work to be carried on, not only from hand to mouth but at full pressure, came to nothing. As, therefore, the construction work gradually ceased during 1911 the construction staff would have slowly dwindled away, together with other sections of the staff, whose work was chiefly dependent on new construction. It was not a case of being generous to one or two old servants. It was not a case of stretching a point and making work for a brief period for a small number of men temporarily not required. It was an infinitely larger question with which the Company was faced.

The Company, realising the grave hardship to which a large body of the staff were exposed, reviewed the position with a view to finding some remedy. The situation since negotiations with the Post Office began a year or two ago was somewhat changed. A considerable number of men had, unfortunately, during the last two years been discharged. The construction staff which then existed was engaged not only on the joining up of new lines, but also in the important work of anticipating future developments, in accordance with the policy of all progressive telephone administrations. The Post Office being unable to give adequate assistance in the solution of the problem, although all that was asked of them was to assist in the full and necessary development of their own future property, the number of new lines which were being connected up every month was ascertained by the Company and it was found that, if that rate of connection was maintained until the end of the license, employment could be found for the construction staff in its present dimensions. The Company, therefore, decided not to discontinue canvassing or the running of new lines even after the period when they will no longer be fully remunerative, but will go on utilising spare plant until the end of 1911. A means of employment for all the existing staff will thus be assured. We believe the considerate action taken by the Board to avoid the necessity for further dismissals will meet with the appreciation of the telephone public as well as that of the whole staff.

OBSERVATION.

THE subject of service observation, as Mr. OLDHAM well said in his article which we published last month, is a very extensive and important one and by no means to be exhausted in a single article; but one sentence in particular is worthy of remark, viz.: "It should always be remembered and realised by the operators that it is the *service* that is being observed and not the *servants*, the operating as distinguished from the operators."

To the rank and file of a large staff the obviousness of this truth is not perhaps so apparent as to the higher grades. Observations and service tests have often a vexatious aspect to the busy operator who does not always realise their immense value in feeling, as it were, the pulse of the service; and in some cases, perhaps, she suspects only a trap to catch her off her guard. We are sure, however, that every understanding and keen operator (the vast majority) can be convinced that all supervision and observation is intended for her assistance, for the perfecting of the service, and not for purposes of fault-finding; and we are equally sure that the vast majority of the supervising staff endeavour to make the operating staff feel this.

We have on a former occasion especially welcomed the formation of operators' telephone societies because we know that the individual operator has there such a unique opportunity of discussing and understanding the why and wherefore of proceedings and regulations which are often perplexing and incomprehensible to those who are ignorant of their basis and necessity. It is impossible to know the inner workings of individual minds, and the action and reaction of opinions of units of the staff one upon another; and such opinions have a great effect on the *morale* and efficiency of a staff. It is therefore an all-important matter to endeavour to set these opinions on sound and not on ignorant

foundations; for with a widespread soundness of view wonders can be effected. For this reason we are always glad to utilise in the JOURNAL any opportunity which may present itself to let in further light on operating (as on other matters) and to render, to all grades of the staff, their work more interesting, more intelligible and therefore more agreeable.

HIC ET UBIQUE.

WE had thought that municipal telephony was about as dead as ping-pong. The analogy between the two diversions—for municipal telephony is a form of diversion for those who plunge into it—may be pressed further. Both had a sort of newspaper-excited vogue in the early nineteen-hundreds, and both were considerably deader than mutton in the course of three or four brief, exciting years. But there, unfortunately, the analogy ends, for whilst the ping-pong player scrapped his bats, celluloid balls, and little green baize tables at his own cost, the loss on the other game is being met by the taxpayer. Some extraordinary proposals as to the municipalisation of the telephone have been put forward in well-known quarters, and backed up by some of those fallacious facts and figures which are too well known to our readers to be sufficiently novel for animadversion on here.

A CORRESPONDENT sends us a paper called the *Canadian Gazette*, published in London, in which the following appears:—

We in London think ourselves fortunate in getting the telephone for £4 a year as subscription and *id.* per local call. The people of Port Arthur, Ontario, are rejoicing in a far better service for *one dollar per year* for private houses and *two dollars* for stores, and even at these low figures we read the telephones make a profit. Mr. Buxton is about to take over the National Telephone service. He had better send one of his smart young men to the Lake City to find out how much better they manage some things in Canada.

The paragraph is not important in itself, but it is typical of a certain kind of criticism. What is meant by a "far better service"? Why compare such a place with London in any respect or for any purpose whatever? The whole thing is so devoid of meaning, of detailed information and of all basis of intelligent comparison. As regards the sending out of smart young men we think the *Gazette* might send one to the London contract office to get a more exact idea of the London rates.

OUR Plymouth correspondent sends us the following example of twentieth century knowledge of telephones:—

Whilst pushing draw rods through certain conduits in Plymouth the Company's men were stopped by an apparently well-educated person, judging by his address, and asked what work was being carried out. Upon receiving the reply that it was in connection with the telephones, he said: "Oh, I suppose the hollow tube (referring to the hole in the draw rod) is the place through which the sound passes?"

This episode can be absolutely vouched for, and has not migrated from the "Plymouth" on the other side.

It has long been recognised, says a Glasgow correspondent, that contract officers, and particularly those of the feminine gender, have to face many trying situations and to answer many embarrassing questions. Hitherto these have been sprung upon them for the most part in the houses or offices of prospective subscribers, and they have been catalogued as all in the way of business and as part of the day's work. One can only imagine, therefore, the feelings of the lady who, on returning to the office, after a more or less successful day's work, is met by an anxious Contract Manager with the apparently impertinent query, "Well, have you had any proposals?"

Mr. H. V. Fox sends the following explanation of the origin of the expression "O.K." from a *Scrapbook of Curious Facts*:—

More than a century ago the best tobacco and the best rum came from the Aux Cayes (pronounced O.K.), and the best of

everything was designated as Aux Cayes, or O.K. This meaning of the phrase is still retained.

In the Jackson campaign every lie that could be invented was invented to blacken the general's character, and an endorsement that he had made, "this is O.K." (meaning best), was taken by Seba Smith and declared by him to be but an abbreviation of the general's customary endorsement of papers as "oll kerrect."

The Democrats took up this statement and fastened the mystic letters to their banners. The meaning "all correct" stuck to the letters, and since then they have been used in the two meanings of "the best" and "all right."

METHOD OF LOCATING AND REPAIRING FAULTS IN UNDERGROUND CABLE.

By J. W. WARNOCK, *Assistant Engineer, Glasgow.*

WITH reference to Mr. Gillmore's letter in the November issue of the JOURNAL, I give below some notes on troubles of the kind mentioned which we have experienced in Glasgow.

The use of the Silvertown test set for the locating of faults having been explained in O6 and U9, pages 7 and 8, I take it that Mr. Gillmore has seen to it that at least one of his staff has thorough mastery of it. If he has been fortunate enough not to have required to use it for the locating of faults, he would be well advised to connect up some leads, putting on faults (contacts, earths and S.C.), and locating the same with the Silvertown. In this manner he will make himself ready for the day, which I sincerely hope may be far distant, for him, when he will hear the alarming report, "such and such a cable has gone faulty." When he hears of such a case he should "hurry slowly," always remembering "the more haste the less speed." To some it may seem a great loss of time to spend from half to one hour getting a good wire in a roundabout way, and making the test; but it pays in the end, when you are able to walk to the place and say with almost absolute confidence that the fault is there. When you find it is there, you will be fully justified in spending the time.

When a cable breaks down, the greatest trouble is in getting a good wire for a return, and many a different expedient has to be adopted to get round the fault. The following are some of the methods which, to my knowledge, have been used:—

No. 1 was the case of an aerial cable which was faulty

- (a) between B and E, also
- (b) between B and F.

(a) A spare cable wire was used from A to B, and spare open wire between B and E, which was connected on to a faulty wire between A and E and then test taken. Result worked out to 700 yards from "A." A test (cond res.) was taken from A to B, which gave a result of 500 yards; 400 yards were then stepped from B towards E and the fault was at once discovered.

(b) The same spare wire was used between A and B, but as no spare wire existed between B and F a working open circuit was temporarily cut out and line used. The fault was tested to be 1,300 yards. When the 1,000 yards were stepped out it came to a point about 15 yards past the pole where the fault was.

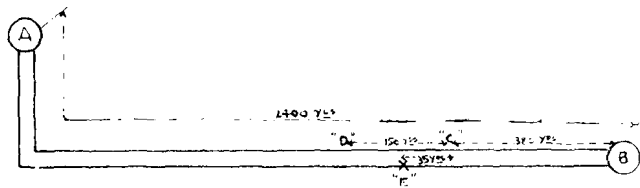
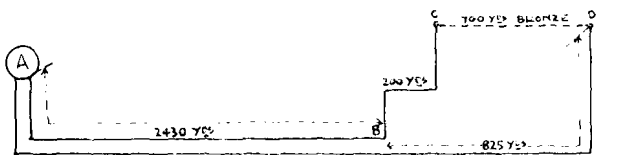
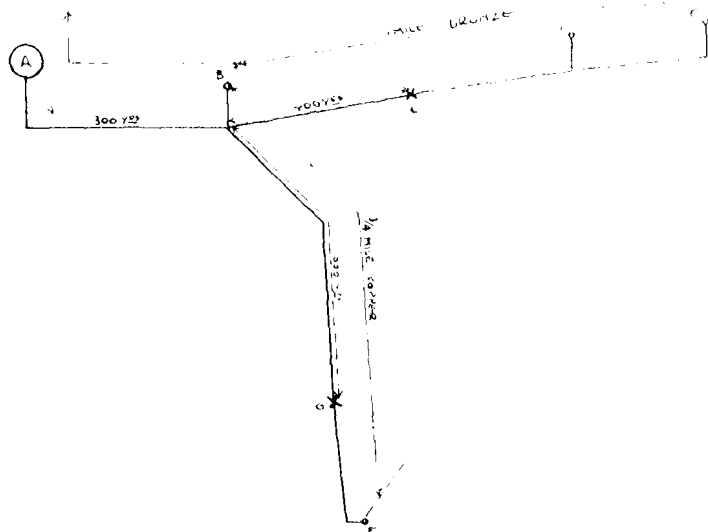
No. 2 was a case where the shunt "B.C." was low in insulation and a sufficient good wire could not be got to permit of a test being made. A spare cable wire was used from A to D joined on to a spare open wire D to C which was connected to the lowest wire between A and C. The test was taken and the fault located to be in duct under car rails. This section was cut out on a Saturday afternoon which made things "O.K."

No. 3 was a case where the whole cable was damp and it was not convenient to get a good return without opening another cable. The faulty cable as well as an "O.K." one was opened at point "B." A wire in each was picked up and the test made. When the cable diagram 8,973 was consulted the fault was seen to be between C and D manholes. The joints on faulty cable in these manholes were opened and the fault still being tested between, a V.I.R. lead was run along the ground to allow of another test being made which

gave the exact position of fault. The ground was opened about two yards beyond this from the nearest manhole and the faulty section cut out.

The above gives different methods of getting round the fault with a good return but it is impossible to set down a definite rule, and each case must be taken on its merits.

As to the repairing of faults after location, if the dampness has been arrested before travelling far into the cable the fault can be cleared by removing the lead sheath or sleeve and drying the cable out by means of blow lamps. If the dampness has travelled



along the cable it will be found better to open the cable about two yards further on and, if now past the dampness, to cut that piece out and get rid of all the trouble.

As to temporary means it is generally rather difficult to get an alternative route, and the fault in the cable can be cleared as soon as, if not sooner than, the temporary measures can be brought into use. Therefore it does not seem expedient to trouble about temporary arrangements unless the fault is of such a nature or in such a place that it is not convenient to have the trouble removed at once. What to do in such a case can only be answered definitely with a full local knowledge of the whole circumstances.

PREMIUMS FOR TELEPHONE SOCIETIES' PAPERS.—
SESSION 1909-10.

At the commencement of the Bristol District Telephone Society meeting on Nov. 17, 1910, Mr. R. A. Dalzell, Provincial Superintendent, presented two cheques to Messrs. W. W. Roberts, Local Manager, Brighton, and Mr. A. E. Coombs, Traffic Manager, Bristol, for their prize papers on "Development" and "Traffic" respectively. Mr. Dalzell, in a few well-chosen remarks, referred to the pleasure it afforded him in having the opportunity of awarding these cheques, and also at having been privileged to hear each of the papers read by the winners.

Mr. Roberts and Mr. Coombs suitably responded.

AWARDS MADE FOR SUGGESTIONS, ETC.

We publish the list of awards made by the Education Committee for useful inventions and suggestions made by the staff. It will be noticed that a lady's name, that of Miss E. K. Reynolds, of Bolton, appears in the list for the first time:—

	£	s.	d.
R. S. Kirkwood, Glasgow, work order cost slip	2	0	0
T. R. Rawlings, Bristol, valued call sheets	2	0	0
G. H. Carrier, Birmingham, table of practical approximate weights of varying lengths of wire	2	0	0
B. Murphy, Dublin, subscriber's fault card	2	0	0
H. R. Hircoe, Hull, rate demand note book	2	0	0
J. M. Anderson, Glasgow, sorting frame for tickets	2	0	0
A. K. Fraser, Head Office, instrument for measuring electrostatic capacity	0	10	0
H. C. May, Head Office, instrument for measuring electrostatic capacity	0	10	0
H. Hatton, Brighton, box for insulating tape	2	0	0
J. Cree, London, ready reckoner for resistances	2	0	0
J. A. Millett, Reading, night bell contacts on Ericsson switchboards	2	0	0
F. Michaelson, Manchester, improvement of O.W. key tops	2	0	0
R. Meredith, London, cross talk test	2	0	0
P. Swan, London, convertible C.B. and L.B. electrophone table	2	0	0
W. H. Cooke, Cardiff, carbon block terminal	2	0	0
F. C. Scannell, Dublin, circuit for flashing "A" operators' supervisory signals	2	0	0
E. Spargo, Liverpool, fitting of pulls on plugs	2	0	0
E. Harper, Southampton, modification of wire wrapping tools	2	0	0
Miss E. K. Reynolds, Bolton, linen pad to protect operators' clothing from transmitters	2	0	0
H. Ross, London, alteration to C.B. switchboard plugs	2	0	0
C. G. Barker, Head Office, local line allowances	2	0	0
.. .. . new method of splitting up route into two types of cable	2	0	0
G. Dale, Gloucester, alteration to jointing clamp	2	0	0
W. Martin, London, make off of steel suspender enclosed in cable	2	0	0
J. O. Robertson, London, revised works order	2	0	0

Grants to Local Telephone Societies—

Greenock	4	6	0
Paisley	4	0	0
Newcastle	4	16	0
Sunderland and South Shields	4	7	0
Hull	4	14	0
Leeds	4	6	0
Bradford	3	15	0
Blackburn	5	0	0
Bolton	5	0	0
Warrington	5	0	0
Liverpool and Birkenhead	4	17	0
.. .. . Operators'	5	0	0
Chester	4	4	0
Nottingham	4	9	0
Leicester	4	0	0
Birmingham	4	6	0
.. .. . Operators'	4	10	0
Wolverhampton	4	18	0
Northampton	4	3	0
Brighton	4	5	0
Hastings and Eastbourne	4	5	0
Dover	4	5	0
Tunbridge Wells	3	6	0
Cardiff	4	5	0
.. .. . Operators'	4	12	0
Exeter	4	16	0
Gloucester	4	9	0
Cheltenham	5	0	0
London	3	6	0
.. .. . (Western)	3	14	0
.. .. . (Southern)	3	3	0
.. .. . (North-Eastern)	3	18	0
Dublin	3	12	0
Notts Factory	5	0	0
Cork	4	7	0
Sheffield	4	9	0
Oldham	3	17	0
Luton	4	10	0
Hanley	3	17	0
Weymouth	4	2	0
Dundee	4	8	0
Truro	5	0	0

Awards for obtaining Medals

F. Bastow, Bradford, for obtaining silver medal	4	0	0
F. W. Friday, Head Office, for obtaining silver medal	4	0	0
R. Mentasti, Manchester, for obtaining bronze medal	3	0	0
W. K. Ward, London, for obtaining bronze medal	3	0	0

AUTOMATIC *versus* MANUAL SWITCHBOARDS.

BY JOHN J. CARTY, *Chief Engineer American Telephone and Telegraph Company.*

(Concluded from page 170.)

We already have an effective long distance service through underground cables of the Pupin type from New York to Philadelphia (90 miles), and good talking with prompt connections is an everyday matter between New York and Boston (235 miles). Our long distance wires extend to Chicago and other more distant western cities, and to Washington, Baltimore, Atlanta and other places in the far south. At the present time we are extending an underground cable of the Pupin type from New York to Washington (235 miles), and are making surveys and plans for an extension from New York to Boston. More than this, by the adoption of phantom loaded overhead circuits between New York and Chicago, and by similar extensions westward as far as Omaha, and thence to the Rocky Mountains, we expect by Jan. 1 next to have so greatly extended our "long distance" frontier that conversation may be held between Denver, Colo., and New York City, a distance of 2,200 miles.

I have mentioned these things to give a suggestion of the intricacy and magnitude of the system for which switchboards must be provided and to bring out strongly the point of view from which we must judge the capabilities of this so-called automatic system. Our problem is national, not parochial—it is indeed even international as your presence here to-day so eloquently testifies.

We must provide for the public a comprehensive system of which switchboards form only a part; and which shall be suitable not only for to-day, and for this year and for the next, but which shall be at its best obtainable efficiency during each period of its entire life. These things we must do if we are to avoid stupendous blunders and enormous reconstruction costs.

We must regard our growing plant as the landscape architect views the subject matter with which he works. He must plant his trees and shrubs not with a view to the immediate results, but he must have in mind the space which will be occupied, and the shape and character of his plantation as it grows to maturity. He must leave room for his trees to grow and must have in his mind at the beginning the total effect which he desires to produce. So it is with us. We must not install a system because of its fancied immediate attractiveness, if we can discern, by looking into the future, that its growth must be stunted and that it cannot survive the cold winters of practice. We are planning a magnificent park with its groves of trees and shrubs. We are not raising vegetables. We are planting avenues of oaks, not a bed of mushrooms.

It is with such thoughts as these that we have studied the question of different types of switchboards in America, and when thus considered, it is surprising to see how many of the features of the so-called automatic system fail to apply to the conditions of practice. Among these conditions with us is the necessity of providing private branch exchange service. This is done by locating at the subscriber's premises a switchboard provided with trunk lines extending to the central office and with a number of stations, sometimes a very large number, located in different parts of the subscriber's premises and connected with the P. B. Ex. Some of these private branch exchanges have as many as 1,200 stations connected with them. This number, however, is exceptional.

By means of this private branch exchange system a most satisfactory method of giving local connections throughout the different parts of the subscriber's premises is provided and from any of these stations by means of trunk lines to the central office, connection can be had to any other station in the entire telephone system, whether it be reached by local, suburban or long distance trunk lines.

Notwithstanding the work that has been done and all the claims that have been made, no practical way has been discovered for doing away with the operators at these private branch exchanges, and the outlook for a practical solution, meeting all of the plant, traffic and commercial requirements, is so discouraging that at the present time the best opinion is that nothing but failure in this respect is to be expected. It should not be understood that

at each of these P. B. Ex. switchboards there is an operator solely devoted to handling telephone calls. While this is the case in the larger installations, in the smaller ones, of which there are a very large number, the switchboard is operated by a clerk or someone who has also other duties to perform.

This P. B. Ex. development forms one of the most satisfactory and important features of the telephone in America. Some idea of its popularity and the magnitude which it has attained and is expected to attain will be gathered from the following figures:—In 1900, New York City had a total of 1,050 P. B. Ex. switchboards, located at subscribers' premises and serving 12,650 stations, connected with them. In 1910 there are 11,960 P. B. Ex. switchboards, to which there are connected 162,560 stations. In 1930, as a result of our studies of this subject, we are planning for 88,400 P. B. Ex. switchboards, having connected with them a total of 1,070,000 stations. These figures have a deep significance. They show that in the carrying out of plans upon which construction work is now being done that we shall reach a point where more than half of the stations connected with the New York City system would require to be handled by operators, even if automatic switchboards were installed at the central office. But more operators than these would be required in an automatic system applied to New York. Large numbers of toll operators and of long distance operators and monitor operators and operators for many other classes of service would be needed.

I have not before me a computation as to the total number which would be required in the system which we are planning, but some years ago a careful study was made with a view to seeing how far the automatic system might be advantageously used in New York City at that time. It was then found that counting P. B. Ex. operators and the central office operators, the so-called manual system would require 13,000 operators, and that in the so-called automatic system, leaving out of account the "mechanician operators," there would be required 10,000 operators.

We have studied this automatic system not only in connection with its application to large cities, but also when applied to an entire State. For this purpose a thorough study was made of the telephone system of the State of Connecticut. This study was made by a large staff of most competent engineers and consumed several months in the making. The result of this was to show that at the time the study was made, if we counted all of the private branch and other operators needed with the manual system, there was a total of 892 required. A similar careful study showed that if the automatic system were installed 600 operators would be needed, not counting the "mechanician operators."

All these things show that the automatic system, which has so many alluring features about it when its application to simple conditions is considered, becomes more and more unsuitable as the plant grows. Even when the automatic system is applied to the simple case of a single office district we have yet to find an instance in which the total annual charges lying against it are less than the manual.

I am aware that statements have been made by the partisans of the automatic system purporting to show that the annual charges on that system are much lower than on the manual. We have analysed the conditions of these cases and found the comparison was not made upon a fair basis. Where these automatic systems have been installed they have taken the place of obsolete or inefficient manual systems and the comparison has been made between an automatic switchboard of the most efficient type known and a manual switchboard of a very defective type. In some cases the comparison has been made between the best type of automatic and the very poorest known type of manual switchboard. It is not surprising, therefore, that from such comparisons figures could be obtained which would appear to favour the automatic. We have been at great pains and expense to make these comparisons on a proper basis and in a thorough and fair manner.

We have made studies in a number of cities in America, taking into account the factors of operating, maintenance, depreciation, taxes, insurance, and so forth. In every case we found that the annual charges were in favour of the so-called manual system.

I think enough has been said to show that the automatic system properly considered, does not do away with operators, does not operate without the constant surveillance of skilled mechanicians,

and that is in truth not an automatic system at all, but merely one form of semi-automatic system, of which the so-called manual is another.

By such considerations as these we are led to a point from which we can approach our subject with a mind freed from bias. By so doing we clearly see that we have not to do with a partisan controversy about manual switchboards *versus* automatic switchboards. We have before us a broad question in telephone engineering, requiring for its solution a clear apprehension of a host of subjects pertaining to the plant, traffic and commercial activities of the company or administration. It is a grave mistake to regard our problem as being one for the mechanic only; it is much broader and deeper than this, involving important questions of political economy.

Having stripped our question of its verbal disguise, we see that the two systems are not so antagonistic as would at first appear. They both stand upon this common ground: Each recognises the importance of manual operations guided by human intelligence; each recognises the importance of automatic machinery; each system employs both agencies; each system is semi-automatic.

We are now prepared to formulate the question anew. We see that it becomes a problem of dividing the total operations to be performed in such a manner that labour guided by human intelligence shall be employed where it is most effective, and that automatic machinery shall be employed where it is most effective. Properly stated, therefore, our question is, "What is the best type of semi-automatic switchboard?"

The so-called automatic system, as I have shown, is found unsuitable for the demands of a comprehensive system. The so-called manual system has been tested by the most severe demands of a system composed of 5,000,000 telephones, and it has been found to answer every substantial requirement. By its means we are to-day giving an excellent service, and our studies of the future requirements show that if nothing better is attainable we can, with the manual system, supply in a satisfactory manner all the demands of the public.

But it would not do for us to rest content with this; we must at all times strive for improvements. These are the traditions of the American Telephone and Telegraph Company, added to which are the specific orders from President Vail frequently reiterated, that we must constantly seek for improvements, so that we may at all times when it is reasonable and practicable place at the disposal of the public that system which solid experience has demonstrated to be the best.

Pursuant to this policy we have spent hundreds of thousands of dollars in experiments and investigations pertaining to this subject.

We have, after many years of work, developed and are now installing at New York for an experimental demonstration a system which is avowedly semi-automatic, and not disguised under another name. The advocates of this system contend that it is a mistake to place, as is done in the so-called automatic systems, complicated automatic machinery at each sub-station. (A sub-station is any telephone set at the subscriber's premises which may be connected to the central office.) They favour the use of a sub-station instrument identical with that employed in the so-called manual, and they assert that this instrument is really much more automatic than the instrument employed in the so-called automatic system itself.

We must admit that there is much force in this statement, for an analysis of the operation of the two instruments shows that the manual operations required at the automatic station are several times more numerous than at the manual station; in fact, all of the manual operations required at the manual station are also required at the automatic station. To these must be added at the automatic station a number of other manual acts, depending upon the character of the call to be sent.

It is further asserted that the apparatus at the automatic sub-station is complicated to a high degree, whereas at the manual station it consists of simple elements, and that in consequence of this, with the vast multiplication of stations which must take place in a successful telephone system, the automatic system would be placed at a great disadvantage.

In this semi-automatic system about which I am now talking a counterpart of the automatic apparatus which is required at each subscriber's station in the automatic system is placed at the

central office. Thus one of these pieces of apparatus is required for each "A" operator's position instead of one for each sub-station on the subscriber's premises. This greatly reduces the number of complications, and one of them being required for each operator's position only, much more money is available to be expended upon its construction. Hence it can be made with great precision and so as to give much more reliable working. Furthermore, these pieces of apparatus being at the central office, they are under the constant care of expert maintenance employees, who can instantly substitute a spare apparatus for one which should become defective.

It is contended on behalf of this semi-automatic system that the "A" operator's position (the "A" operator is the one who answers the subscriber in the first instance) is a point at which human intelligence is needed, because of the numerous exigencies of the service. I have carefully looked into this statement, and I am much impressed with the force of the reasons given in support of it. While the position of the "A" operator seems to be one where human intelligence is required, it is not so at the position of the "B" operator (the "B" operator is the one who receives the trunk call from an "A" operator at another office). When the work of this "B" operator is analysed it will be found theoretically that it can all be done by machinery, and that the work to be performed does not require human intelligence. Consequently, in this semi-automatic system, all of the "B" operators are eliminated and machines substituted. This very greatly reduces the total number of operators required, and if the machinery can be made to work satisfactorily it is believed that greater precision of working will be attained. This expectation is based upon statistics which show that a large part of the errors made at the central office take place between the "A" operator and the "B" operator.

As the pieces of automatic apparatus needed in the semi-automatic system at the "A" operators' positions in the central office are relatively small in number, it does not seriously increase the total expense to design and construct them with the greatest care and with the best workmanship, so that the utmost degree of precision may be obtained in their working. On account of the enormous number of such pieces of apparatus which would be required if they were distributed at the subscribers' premises, one for each telephone station as is required in the automatic system, the same high degree of design and workmanship cannot be applied, because the costs would be multiplied exceedingly. Hence in respect to these vital parts of the two systems the automatic system must always stand at a disadvantage.

The result of this has been to produce for the semi-automatic system an apparatus operated by a keyboard similar to that used on the typewriter. Working with such a keyboard, it has been experimentally demonstrated that the "A" operator can handle a very much greater number of calls than she could in the so-called manual system. This fact greatly reduces even the number of "A" operators.

The advocates of this system contend that they have made the best division of labour, the best distribution of automatic machinery, and that they can attain a higher degree of efficiency and much lower annual costs than are attainable with either the so-called manual system or the so-called automatic system.

Engaged upon this study and upon these experiments we have had a corps of capable engineers and experimentalists working for years, and I feel warranted in attaching great weight to their favourable expectations.

Soon after my return to America, I hope to be present at the opening of the semi-automatic switchboard, and until we have obtained the results of this working, there is not much more that I can profitably say upon the details of the subject.

In conclusion, the situation as I view it is as follows:—The so-called automatic system is not, in fact, automatic, it is only partly so. It has been fairly and exhaustively studied and found to be unsuitable for the comprehensive demands of our present service, and more and more unsuitable when considered with respect to the demands of the future.

The so-called manual system has successfully withstood the severe demands of a system comprehending 5,000,000 telephones and all of our careful studies with respect to future growth have shown that if nothing better were obtainable, it would furnish to us

a means whereby we could supply an excellent universal service to all the people of the United States.

As I have already stated, a third system, frankly called a semi-automatic system, is about to be practically tried. If the expectations regarding it are realised, it will be a system more efficient and more economical than either the so-called manual or the so-called automatic.

Before leaving this subject, I wish to speak briefly upon one point. It has been said by some that we have not generally adopted the so-called automatic system, because we have been deterred by the large expenditure of money which would be required.

I shall promptly show you that there is no truth in this. The history of the telephone in America has been that of rapid change from one system to another, as soon as improvements have been demonstrated. Pursuant to this policy, the plant at New York has been constructed and reconstructed three times. A similar story is to be told of the rest of the country. Our company has been so conservatively financed and our administration has been so keen to adopt new improvements, that ample depreciation funds have been accumulated so that just as soon as it is demonstrated that a better switchboard system is available, we are prepared to begin its installation and proceed with the utmost practicable speed to make the change. All of this could be done without the slightest disturbance in our financial arrangements.

While there rests upon us the responsibility of adopting as soon as it is practicable and reasonable to do so that which is best, there is a corresponding and most serious obligation of not throwing away what has been demonstrated to be a thoroughly efficient system, without having it conclusively demonstrated that there is something better. I do not see anything in the present state of affairs which need give any company or any administration any concern with respect to the possibilities of a sudden change, for even if it were demonstrated that a better system were now available, it would be impossible, taking into account the manufacturing and engineering resources of all the world, to make the change except in a gradual manner. We have already had so much experience with such changes that we know how they must take place. They are accomplished by a process of gradual evolution and not by sudden revolution.

In every administration there are from time to time switchboards which have been worked for the full period of their life. These must be replaced in any event, and when such cases arise the new type of switchboard is installed. This does not involve the abandonment of apparatus having further usefulness. There are also constantly arising cases where new installations must be made. These can be installed on the new plan. Obviously this does not require that any existing apparatus be thrown away. The manufacturers and the administration staffs would find themselves so fully occupied with this work that they would not for some years be able, even if it were desirable, to disturb those central offices in which the switchboards have many more years of life. It will be found that by the time the old switchboards have been replaced and the new ones installed those switchboards which have had to be removed in advance of the expiration of their life would be few, and in those cases the work would not be anticipated by a great many years. Even where a switchboard is removed before its life has expired, this need only be done when it is found best, all things considered, to replace it by a new one rather than to continue it in service. There is nothing in this situation which demands a headlong rush, so, without wasting any time, we should proceed with deliberate care.

We who are charged with the great responsibility of rendering such an important service to the public cannot be justly criticised if we refuse to be carried away by the enthusiasm of manufacturers and inventors, and thus to be led into a wholesale and probably disastrous experimentation upon the public.

In America we have pursued this subject for many years with the utmost diligence. An important practical demonstration is about to be made. We cannot foretell the answer, but we must accept it whatever it may be.

I have told some of the things we have done. It has been our constant aim to keep an open mind and to be free from bias. We are seeking only the truth, and from that we have nothing to fear.

MEMORANDUM ON THE CONTINUED EMPLOYMENT OF THE COMPANY'S STAFF ON CONSTRUCTION WORK.

THE following memorandum was issued on Nov. 23 and has been circulated throughout all the offices and stores of the Company:—

In its memorandum of Feb. 1, 1909, the Company set out the difficulties experienced in the way of securing employment for its construction staff until the termination of the license, and since that date negotiations with the Post Office have been continued but the result has not enabled capital expenditure to proceed in such a way as to provide either for a normal development of the system or for a full employment of the staff.

Following upon this result the Company has reviewed the position with a view to ascertaining if any modification of its present and future policy could be adopted which would obviate the necessity for further dismissals.

The policy which the Company had proposed to adopt would have necessitated the cessation of canvassing for new business during some portion of the year 1911, thus entailing further dismissals of staff. In view, however, of the undoubted hardship such a course would involve, the Board has now agreed to modify that policy so as to continue canvassing and consequent development of existing plant for a later period than was previously contemplated. The result of this decision enables the Company, subject to the existing conditions of the service, to state that unless unforeseen circumstances arise it will be able to retain its existing staff (including construction staff) until the end of the license.

GEORGE FRANKLIN, President.

Telephone House, Victoria Embankment,
London, E.C., Nov. 23, 1910.

LONDON NOTES.

MR. A. E. ABBOTT, Exchange Manager, North, who has just been appointed Exchange Manager, Central Exchange, Birmingham, carries with him to the Midland capital the best wishes of his London colleagues, and their congratulations on his promotion. Mr. Abbott has been succeeded by Mr. J. A. Jenkins, promoted from Bank; while Mr. T. A. Beck, Assistant Exchange Manager, Gerrard, has been appointed to the Bank vacancy.

THE Contract Department has sustained a great loss by the death of Mr. W. H. Elkington, one of the City Contract Officers. Mr. Elkington had been in the service for about fifteen years. At his funeral the Company was represented by Mr. Nicholls, Acting Contract Manager; Mr. Bigland, Divisional Contract Agent, City; and Mr. Culpin, Chief Clerk, City Contract Office. Wreaths were sent by the Company and the contract staff.

THE presence of Mr. Franklin, the President of the Company, added considerable interest to the November meeting of the London Telephone Society. Mr. Franklin's main object was to present the premiums awarded by the Education Committee for successful papers to those members of the Head Office and Metropolitan staffs who were amongst the prize winners. Cheques were also handed to two young men—one from the Engineer-in-Chief's office and the other from the Metropolitan staff—who had gained medals in recent technical examinations. In his preliminary remarks the President took occasion to express the interest with which the Board had followed the development of telephone societies, and had recognised the great influence they were exercising amongst the staff in promoting the study of telephone science. Afterwards, in acknowledging a vote of thanks, proposed by Mr. Clay, Mr. Franklin referred in very eloquent terms to the importance of technical education and the part which it necessarily plays in mental equipment. The whole function passed off very happily and successfully. Following the more ceremonial portion of the meeting, Mr. P. T. Wood read a paper on the "Work of the Electrical Department in London—what it had achieved and what it sought to attain." The paper was a composite one, Messrs. Greenham, Ridd and Wright having been co-authors with Mr. Wood. Several interesting points, dealing with such questions as costs of maintenance and fitting, reciprocal working with other departments, analysis of faults, completion of works orders, and inspection of C.B. instruments were brought out. Considering that many of them had been hurriedly prepared, the illustrative slides were very good. The subsequent discussion was short, but not without animation.



W. H. ELKINGTON.

WITH a view to interesting those members of the staff who come most in contact with the public in the electrophone, a series of special "hearings" was arranged. Three were held during November, there being about 25 present in the electrophone reception-room on each occasion. Mr. Booth, the Electrophone

Company's Manager; Mr. Greenham, Metropolitan Electrician; and Mr. Pattman, the Company's Officer-in-Charge, spoke at one or other of the gatherings. It is desired to encourage the use of the electrophone by subscribers, and as a commission is paid on all orders secured by the staff, it is hoped that increased business may result. Not only contract officers but inspectors and fitters might be able to do something.

The annual meeting of the Provident Club was held on Nov. 18. Owing to inventory work having necessitated the departure of both secretary and treasurer new officers had to be found. Mr. Harvey Lowe consented to act as treasurer, and Mr. J. Burrell was appointed secretary, with Mr. H. E. Bailey as assistant. The club has been very prosperous during 1910, there having been an increase of nearly 50 per cent. in the membership. The new season starts on Dec. 3, 1910, and no member of the staff who requires a little extra income in time of sickness should fail to join.

Two very interesting papers were read at the second meeting of the Telephone Operators' Society on Nov. 16 (at which, by the way, there was an attendance of 231), both provocative of much discussion: and, indeed, the points raised were so many that an evening might well have been devoted to each of them. The first, by Mr. Webb, Assistant Exchange Manager, London Wall, was on "Distribution," in which, perhaps, the most interesting feature was the striking way in which the amount of information now available as to the traffic on the various subscribers' lines, and the use made of it in apportioning the operators' loads, were demonstrated. The second, by Miss Godden, Operator at Avenue Exchange, was on "Catering." This paper, on a subject which by some might be considered beneath the dignity of a telephone society, gave ample and, to some extent, quite unexpected evidence of the important part which such matters bear in the life of the operators. The preparation of the daily menu, the management of the finance, the care for the general comfort of the operators, and even the vagaries of the inevitable grumbler, were all discussed. The debate which followed was almost entirely in the hands of the ladies, and was enlivened with many humorous anecdotes and interesting experiences illustrating the many-sided nature of a caterer's duties.

THE next meeting of the London Telephone Operators' Society will be held on Dec. 12, when debates will take place on the following subjects:—"Are Speed of Answer Tests Useful?" and "The Method of Answering Originating Calls." As these are the first debates arranged by the society it is hoped that all members will attend so as to ensure a successful evening.

GLASGOW NOTES.

PRIOR to the ordinary meeting of the telephone society on Nov. 9, an interesting function took place. In the Head Office premium competition for the session 1909-1910 Glasgow was fortunate enough to secure two first prizes and one second, these falling to members who had read papers before the society last session. The General Superintendent decided to make the presentation of the prizes in person, and only at the last moment did he find himself unable to travel north. He requested the Superintendent for Scotland to take his place, and Mr. Watson discharged the duty in a very happy fashion. He read a letter from Mr. Goddard, expressing regret at his enforced absence owing to ill-health, and complimenting the Glasgow Society in flattering terms. Mr. Watson also expressed his own gratification and that of the Glasgow management that such a satisfactory proportion of the premiums had been awarded to members of the Glasgow staff.

The ordinary meeting was thereafter proceeded with, four papers being read by prize winners in a local competition confined to members of the minor staff. These were "The Perfect Cash Clerk," by Mr. D. B. Heberton; "An Ideal Apprenticeship," by Mr. W. Inglis; "The Stores," by Mr. A. C. Thomson; and "The Telephone Receiver," by Mr. J. T. Hutchison. All the papers were of an interesting nature and were read to an appreciative audience.

The National Telephone Operators' Society and Club, Session 1910-11. On Nov. 14 the second meeting of the current session was held. On this occasion two most interesting papers were read, both by ladies. The first, entitled "Experiences of a Lady Contract Officer," was submitted by Miss McIntosh, Chief Lady Contract Officer, Glasgow. The second paper, giving the "Experiences of a Call Office Operator," was by Miss B. Gray, Operator, Royal Exchange, Glasgow. In both papers the school of experience brought to light much that was instructive and amusing, and that the papers were greatly appreciated was evident from the heartiness of the vote of thanks accorded both ladies.

The social part of the evening was entered into with the usual vim and a most enjoyable evening passed all too quickly.

A special feature of this year's meetings is the presentation each evening of punctuality prizes; one prize is given by the society, and at the past two meetings, another prize has been given by a member. The lucky recipients at the first meeting of the session were Miss Agnes Ray, Argyle Exchange, and Miss Finlayson, Royal Exchange, and at the second meeting, Miss S. Slater, Royal Exchange, and Miss I. Murray, Langside Exchange.

THE unification of the Post Office and National services here proceeds apace, and work in connection with the transfer of a large body of subscribers from the Company's Royal Exchange to the Departments Central Exchange is at present in hand. One hundred and forty D.P. points are involved, to each of which the Post Office are laying underground circuits for the use of the Company. The transfer is expected to take place on Jan. 1, and a good deal of work remains to be done prior to that date.

THE staff of Argyle Exchange and friends held their annual "At Home" in the Prince of Wales Halls on Nov. 12. About 75 couples were present, amongst

whom were Mr. Rodger (Traffic Manager) and Mrs. Rodger. A most enjoyable evening was spent.

Bill Golf Club.—The annual general meeting was held on Oct. 21. In the absence of Mr. R. F. Kirkwood on inventory duty, Mr. G. Martin, the vice-captain, occupied the chair. The rules were revised and the following office-bearers elected for the ensuing year:—

Mr. G. Martin	Captain.
Mr. A. S. Duncan	Vice-captain.
Mr. D. B. Heberton	Secretary and treasurer.

These three together with Messrs. A. C. Thomson and J. F. Murray form the committee.

National Telephone Bowling Club.—The annual presentation of prizes of the above club took the form of a smoker, held in "The Grill," West Nile Street, on Nov. 28. The president, Mr. W. Fursman, occupied the chair and was supported, amongst others, Messrs. G. Johnstone, James Forrester, J. W. McDonald, and John Johnstone (secretary, Cowlares Bowling Club). There was a very large attendance, including representatives from Cowlares, Gartloch, Queen's Park, Victoria and Post Office Bowling Clubs.

The prize winners are: Champion, Mr. W. Stewart (Engineer's); pairs game, Messrs. T. Carr and F. Springer; rink game, first, Messrs. W. S. MacKie, A. Blair, R. Brown and W. Fursman; second, Messrs. W. Wright, J. McMeeking, H. Sutherland and J. Kennedy.

The musical arrangements reflected great credit upon Mr. Charles Ferguson who was in charge, and amongst those contributing to the harmony of the evening were Messrs. Robertson, Sutherland, Paton, Gordon, McMillan, Biggs, Drysdale and others, and Mr. Fred Murdoch ably presided at the piano.

The annual business meeting of the club will take place early in April, 1911.

CORRESPONDENCE.

DISTRICT OFFICE STORES BOOKKEEPING.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

FROM the figures given by Mr. Thrush in the November JOURNAL it would seem that a great improvement was necessary, which he is to be congratulated on effecting.

It is safe to say he is not satisfied with the position attained and acquired, for dissatisfaction is one of the features of enthusiasm.

In size Mid-Yorks district will much exceed that of West Kent with proportionate bookings, yet the average of 3s. 8d. per station (material 2s. 1d., tools 1s. 7d.) is not low water mark, especially in the tools a/c., whilst the gross stock difference of £10 13s., and nett of £2 15s., is no improvement on recent years, and is capable of betterment.

Given an energetic stores clerk and painstaking storekeepers material should be kept as correctly as cash.

The trouble is in the out-centres. The storekeepers at these are mostly out of touch with the office, except through the medium of correspondence: they have fewer qualifications than are possessed by storekeepers at the larger centres and have insufficient work at the stores to occupy the whole of their time. Their ability to grasp instructions, to initiate and carry out plans for progress, to control men and material, is thus limited.

The cure is the enlargement of the personal oversight of the office, as set forth in the latter part of an article which appeared in the August, 1908, JOURNAL.

The close scrutiny of requisitions and comparison with records, which of necessity cannot be kept daily up to date, the frequent striking of fresh prices, the monthly checking of stores postings, are all valuable aids to correctness. Happy should the district be that has the time to devote to all these.

The control of requisitions is the key of stock control. It is to be regretted that in the latest issue of S.I.B.1 the instruction to "show in proper column of requisition the quantity in stock and on requisition undelivered" has been omitted. The obligation to supply is thereby weakened.

This method is to be preferred over the "maximum" and "minimum." The figures for these latter can only be approximated, and give no clue as to correctness of stock. Besides, with the monthly system in vogue, it is only possible for the office to know the exact position once a month, i.e., ten to fifteen days after the close of each month, by which time large additions or reductions may have taken place.

Where there are storekeepers it is advisable for each of these to estimate and requisition for three months' requirement of small articles, supplying the sub-centres by means of inspectors' visits. Stocking and despatching by the largest stores means cost in packing and conveyance.

The importance of stores work cannot be over-emphasised. It is a fruitful field for efficiency and economy.

Leeds, Nov. 11

G. H. SARGEANT.

"THE TELEPHONE LOAD LINE."

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

WITH further reference to Mr. Deane's paper in the June, July and August JOURNALS and also to Mr. C. H. Toms' letter which appeared in the November JOURNAL, there are a few points with regard to both of these which I think require a little further discussion.

As Mr. Toms' letter deals with some of the controversial paragraphs, I propose taking the various points *seriatim*, omitting only such as call for no comment or are self-evident.

Item 2.—The point of the remark is not quite clear. Does this rather not confirm Mr. Deane's statement referred to—as the fact of operators taking holidays in slack time does not affect the volume of traffic dealt with?

Item 3.—I cannot agree that it would pay to take peg counts once a month at all exchanges of over 300 lines. Only at the larger exchanges, say those with

1,500 lines and over, and at the smaller exchanges, where there is rapid traffic development, would it be profitable to take such monthly peg counts? With regard to the date on which the counts should be taken, would it not be better to specify a week during which these have to be taken and then rely on the local traffic staff to select a day in that week which would be representative of average conditions.

Item 4.—I agree with Mr. Toms here. It is very difficult—quite apart from the principle involved—to credit operators with the operating they do.

Item 6.—I think it was apparent from Mr. Deane's paper that these figures were intended to show the average conditions in London, and as such they could not be adopted in the provinces without due discrimination and the consideration of local conditions. The conditions under which the London service is carried on make these valuations more or less local to London, but at the same time they serve as a very useful guide to others who may be studying the question.

Item 7.—Where I think the difference comes in, is in the wrong time values being given to local calls by Mr. Deane, and consequently the busy seconds in the operators' hours are under-estimated. It would, I think, be agreed that if junction operating could be eliminated on any one of our C.B.I. exchanges the operators would comfortably handle an average of 250 actual calls in the hour. It is perfectly true as Mr. Deane points out (p. 72, paragraphs 2 and 3) that the tendency of local call time values is to increase rather than to decrease, such increase being due—apart from the increased reach—to the joining up of different classes of service, which necessitate more detailed attention on the operators' part.

Item 8.—I think both the figures of Mr. Deane and Mr. Toms may be improved upon with regard to C.B.I. exchanges. The normal B.H. load at Bristol is 240 valued calls, with an average service of ten seconds—five seconds call, five seconds clear. The valuation of calls and proportion of various classes of service, junction work, etc., of course have a bearing on this, but given correct valuations a 240 standard, in so far as value is concerned, should be easy of attainment.

Item 9.—I agree with Mr. Toms.

Item 10.—Would not a "demand" for a repetition be made by the "B" operators' silence? This at least is what was understood.

Item 11.—There does not appear to be any difficulty in travelling from one curve to the other, and the curve as plotted by Mr. Deane appears to be very useful.

Item 14.—It was of course understood that this was an average curve, and applicable to local conditions only—this could hardly be otherwise for "B" operators—but the curve is useful as guide upon which to base other curves.

Item 15.—It is of course understood that the staffing of an Exchange is not worked out from average figures in this way. This was, I think, clearly indicated by Mr. Deane (page 90, paragraphs 2 and 3). The figures quoted in table G were merely deductions from previous figures of actual conditions.

Item 16.—I do not agree with Mr. Toms that the principle of making divisions self-supporting is generally obtained at the expense of an increase in operators, this has not been found to be the case in practice; it does not follow that because there are six divisions in an exchange the operators should be brought in in sixes, or multiples of six, at the various duty times. Are not the total number of operators required per half-hour first decided upon, then such total made up by a proportionate number from each division? The principle of self-supporting divisions is, in my opinion, a very excellent one, and should be carried out as far as it fits in with economical staffing. The suggestions made by Mr. Toms certainly would not tend to co-operation, but to constant friction.

Page 72, paragraph 2. I do not agree with Mr. Deane that it is wrong reasoning to assume that, other things remaining equal, the operators' load should never be increased, apart from a decrease in the time value of the local call. He appears to make no allowance for increased efficiency of the staff, enabling them to reduce the "idle" time referred to at the foot of page 71.

Bristol, Nov. 18.

N. B. NOBLE, Exchange Manager.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I have read Mr. Deane's paper with much interest; he has certainly dealt in a very able manner with a difficult and complicated problem.

On one point I should like a little further information.

On page 49, paragraph 4, Mr. Deane, in the phrase "we must also know the actual time value of our unit, the local call," suggests that there is something which he has not got, and this something seems to be reflected in the time values quoted for local calls on page 48, table "B."

If the average time valuation of a local call at C.B.I. exchanges is 11.42 seconds (per Mr. Deane) and an "A" operator at such exchanges is assumed to be fully loaded when she is dealing with 220 of such calls during the busy hour, it will be found that such operator is engaged 2,512 seconds only (11.42 by 220) during the hour. As there are 3,600 seconds in an hour, this would leave a margin of 1,088 seconds (or approximately eighteen minutes) unaccounted for.

It can hardly be the case, however, that these operators are idle eighteen minutes out of 60 unless one of three things has happened—

- (1) The operators are not fully loaded.
- (2) The operators spend too much time on matters not directly concerned with operating.
- (3) The time values are too low.

I am inclined to the opinion that the latter is the case, for as a result of investigations at Bristol (which is a C.B.I. exchange) the following figures have been obtained:—

Average time valuation of		Average value of junction
Local calls.	Junction calls.	calls in terms of local
13.09 seconds.	20.62 seconds.	1.57 seconds.

The normal busy hour load at Bristol is 240 valued calls, therefore the Bristol "A" operators are engaged, according to the above valuation, 3,142 out of 3,600 seconds per busy hour; in other words, 52.4 minutes out of 60. This would appear to be much nearer the actual condition of things than the figures given by Mr. Deane.

Did Mr. Deane's observations cover the various services, such as flat, measured, call office, money box, etc., in the proportion of their originating calls at each exchange? If the correct proportion of the difficult calls referred to at the bottom of page 48 has not been obtained the figure of 11.42 would not be representative, for of course the valuation of calls depends not only on the apparatus and junction traffic, but on the proportion of the various classes of calls according to service.

Bristol, Nov. 18.

A. E. COOMBS, Traffic Manager.

NEWS OF THE STAFF.

Mr. E. J. JARETT, Local Manager, Wolverhampton, on being transferred to the Inventory staff, was presented with a kit bag and pair of military hair brushes.

Mr. DRING, Local Manager, Worcester, who has been transferred to the Inventory staff, was presented with a kit bag and pipe.

Mr. R. AUBSLEY, Local Manager, Paisley, was presented with a handsome travelling rug on the occasion of his transfer to the Inventory staff.

Mr. W. McPHAN, Assistant Engineer, Paisley, was presented with a dressing case on the occasion of his transfer to the Inventory staff.

Mr. W. E. WALTON, Chief Electrician, Plymouth, has been appointed Lecturer in Telephony and Telegraphy at Plymouth Technical Schools in connection with the evening classes.

Mr. F. J. HEAD, Sub-Engineer, Bristol, has been appointed to the Inventory staff. Prior to leaving Bristol he was presented by his colleagues on the engineering staff with a handsome silver-mounted umbrella as a mark of esteem.

Mr. ROGER K. KEER, M.Sc. Tech. Assoc. M.S.T., Traffic Department, Manchester, has been promoted to a position on the Engineer-in-Chief's staff. On leaving the district he was presented with a gold Albert by the members of the staff.

Mr. G. S. PORTEOUS, of the electrical staff, Edinburgh, on the occasion of his leaving the service, was presented with a gold chain. He sails shortly for New Zealand, where he intends going in for farming.

Mr. G. F. POPE, Engineering Inspector, Coventry, has been promoted to Inspector-in-Charge at Leamington.

Mr. T. W. WICKHAM, Exchange Electrician, Central Exchange, has been appointed Exchange Manager, Liscard Exchange.

Mr. F. C. BURSTALL, Exchange Manager's Clerk, has been appointed Assistant Exchange Manager, Central Exchange.

Mr. F. W. A. CLUTTERBUCK, Exchange Manager-in-Training, Bristol, who has been appointed to the Inventory staff, was before leaving Bristol presented by his colleagues on the traffic staff with a handsome silver-mounted walking stick as a token of esteem.

During the absence of the Chief Clerk, District Engineer and Chief Test Clerk from the Birmingham district on the Inventory staff, the following members have been appointed to act in their stead respectively:—Mr. H. G. SAVAGE, Mr. H. P. LLOYD and Mr. S. LAMBERT.

Mr. L. R. WALKER, of the Engineer-in-Chief's Department, Nottingham Factory, was the recipient of a handsome kit bag and travelling rug on the occasion of his leaving the service to take up an appointment in Odessa. Mr. J. W. BRIGGS made the presentation on behalf of the combined staffs of the Engineer-in-Chief and Factory Manager.

Mr. E. H. MORGAN, Bank Exchange, on his departure for Canada, was presented with a "Thermos flask" and fountain pen on the eve of his departure to Canada. Mr. J. O. COOPER made the presentation on behalf of the operating and electrical staffs, a large number of whom were present to wish Mr. Morgan success in his new sphere.

Miss ELSIE P. E. LAING, Operator at the Broomhill Exchange, Sheffield, resigned from the Company's service on Oct. 27.

Mr. F. H. CHAPLIN, Clerk, Brighton, has been transferred to Liverpool.

Mr. BERTRAM WATERS, Inspector, Brighton, has been transferred to Ipswich.

Mr. FREDERICK W. JACKSON, Fitter, Brighton, has been transferred to London.

Mr. T. WILLIAMS, Cashier, Brighton, has been transferred to Guildford temporarily as Chief Clerk, during the absence of Guildford Chief Clerk on Inventory work.

Miss SARAH JANE JONES, Operator, Central Exchange, Swansea, who has resigned the Company's service, was, on leaving, presented by the members of the operating staff with a writing desk as a mark of esteem.

Miss MABEL A. BALMFORTH, Senior Operator, Batley, who entered the Company's service Jan. 1, 1898, resigned on Oct. 14, 1910, owing, unfortunately, to ill-health.

Mr. F. COLE, Inspector, Eastbourne, was, on the occasion of his transfer to Bath as Inspector, presented by the staff with a Gladstone bag.

Mr. B. STREDWICK, Inspector, Eastbourne, was the recipient of a similar present on the occasion of his transfer to Birmingham as Fitter. Mr. R. CURLING (Local Manager) made both the presentations.

Miss NELLIE BRADSHAW, Supervisor, Nottingham, has been appointed Travelling Supervisor.

Miss POLLY LEVERTON, Operator, Nottingham, has been appointed Supervisor.

Miss ELSIE RILEY, Operator, Whitchurch, left the Company's service on Oct. 28 on account of ill-health. The operating staff in the Cardiff centre have presented her with an ebony-backed brush and comb as a mark of esteem and with sincerest wishes for her speedy recovery to health.

METROPOLITAN STAFF CHANGES.

Mr. S. LAUGHTON, Private Branch Exchange Operator, to be Contract Officer, City.

Mr. J. E. R. HARRISON, Wayleave Officer, North, to be Contract Officer, East.

Mr. W. HOLLAND, Clerk, Divisional Constructional Electrician's Office, South East, to be Fitter, City.

Mr. F. P. HOLMES, Night Operator, Bank, to be Contract Officer, Hop.

Mr. F. G. LEWIS, Test Clerk, Hop, to be Inspector, Hop.

Mr. J. C. FULLER, Inspector, Kensington, to be Clerk, Electrophone Department.

Mr. E. H. NICHOLS, Inspector, Bromley, to be Assistant Engineer, Metropolitan Engineer's Office.

Mr. J. T. LEETE, Assistant Engineer, Hop, to be Assistant Engineer, Metropolitan Engineer's Office.

Mr. C. ROBERTSON, Apprentice, to be Assistant Exchange Manager, Avenue.

Mr. ALBERT ABBOTT, Exchange Manager, North, has been promoted to be Exchange Manager of Central, Birmingham.

Mr. JAMES A. JENKINS, Exchange Manager, Bank, to be Exchange Manager, North. He was presented with silver-handled tea knives by the traffic and maintenance staffs at the Bank Exchange, who expressed their regret at losing him.

Mr. THOMAS BECK, Assistant Exchange Manager, Gerrard, has been made Exchange Manager, Bank.

Mr. THEODORE OLDHAM, Assistant Exchange Manager, Paddington, to be Assistant Exchange Manager, Holborn.

Mr. WALTER COLLERSON, Assistant Exchange Manager, North, to be Assistant Exchange Manager, Paddington.

Miss HILDA LITTLE, Supervisor, Gerrard, to be Supervisor-in-Charge, Richmond.

Miss ANNIE GIFFORD, Supervisor-in-Charge, Richmond, to be Supervisor, Gerrard.

Miss LOUISE SPENCER, Operator, Walthamstow, to be Supervisor, Operating School.

Miss SARAH KEYS, Operator, Bank, to be Supervisor, London Wall.

Miss ADA ROBERTS, Operator, East, to be Supervisor, London Wall.

Miss LOUISA REID, Exchange Clerk, Dalston, to be Exchange Clerk, London Wall.

MARRIAGES.

Mr. S. C. SMITH, District Manager, Maidstone, was married to Miss AGNES JENNINGS at St. Mary Abbot's Church, Kensington, W., on Nov. 14.

Mr. HAROLD WATSON, Rental Clerk, Hull, was presented by the staff with a dinner and tea service, as a mark of their esteem, on the occasion of his recent marriage.

Mr. W. DALTON, Local Manager, Walsall, was presented with a reading lamp on the occasion of his recent marriage.

Mr. W. W. GOULD, District Office Clerk, was presented with a hall stand and dressing case on the occasion of his marriage. He has been transferred to the Inventory staff.

Miss DOROTHY L. DAVIS, Private Branch Exchange Operator (Imperial Tobacco Company), Bristol, has resigned to be married. Prior to her leaving, at a meeting of the operators' telephone society, Mr. Perkins, the District Manager, on behalf of the traffic staff, presented her with a handsome tea service as a mark of esteem. It is also pleasing to record that the Imperial Tobacco Company presented Miss Davis with a cheque for £2 2s. and that the W. D. & H. O. Wills' branch of the Imperial gave her a silver-backed mirror.

Miss GLADYS HUGHES, Operator, Hove, has left the service to be married.

Mr. H. SHEPHERD, Nottingham Factory, was presented with a clock and a dinner service by the members of the Receiver and Cable Departments, Nottingham Factory, on the occasion of his wedding.

Miss IRENE T. HARRISON, Operator, Cardiff, left the Company's service on Oct. 20 in view of her approaching marriage. Prior to her leaving she was presented by the operating staff with an electro-plated cake basket as a mark of esteem and with best wishes for her future happiness.

Miss BEATRICE M. BROADBENT, Chief Operator, Stanningley, who joined the Company's service on Aug. 9, 1895, resigned on Aug. 18, 1910, to be married, and was presented with several personal presents from the members of the staff.

Miss ALICE BRAMLEY, Operator, Leeds Central, who joined the Company's service on Sept. 12, 1902, resigned on Oct. 6, 1910, to be married. She was presented by the staff with a silver cake stand.

Miss CLARABEL H. EVERETT resigned the Company's service on Nov. 3 to be married. Before leaving the operators held a high tea, whereat Miss Everett was presented with a Worcester trinket set.

Mr. S. R. HARRIS, Test Clerk, Plymouth, was presented by Mr. G. Hooper, District Manager, on behalf of the staff, with a handsome teapot, on the occasion of his recent marriage.

Miss IDA OVENS, Operator, Tottenham, on leaving to be married, was presented by the day and night operating staff and Maintenance Department with a silver-plated mounted bread platter.

Miss AMY BLYTON, Operator, Sutton-in-Ashfield, Notts, was presented with a trinket set and tea cosy by the Mansfield staff on the occasion of her marriage.

Miss EMILY MANEY, Travelling Supervisor for the Leeds district, who joined the Company's service on Feb. 24, 1899, and resigned on Sept. 8, 1910, to be married, was presented by the members of the staff with a clock and silver cake stand.

Miss CHARLOTTE BANKS, Supervisor, Operating School, London, on resigning her position on account of her approaching marriage, was presented by the Clerk-in-Charge and supervisors in that department with a Wedgwood and plated biscuit jar.

The marriage took place on Oct. 25 of Mr. ARTHUR CYRIL JENNINGS, A.M.I.E.E., of the Engineering Department of the Telephone Company of

Egypt, and Miss CLARE HAZEL MACKEY, daughter of Mr. and Mrs. Charles Mackay, of Port Elizabeth, Cape Colony. The civil ceremony at the British Consulate, Cairo, was followed by the religious rites at All Saint's Church, Cairo. The bridegroom will be remembered by many old colleagues in East Kent as having formerly been in the Company's service at Canterbury and Margate, whilst the bride's father is ex-mayor of Port Elizabeth, and unsuccessfully contested the Uitenhage Division for the seat in the first United South African Parliament in the Unionist interest. Mr. and Mrs. Jennings, who spent their honeymoon at Alexandria, were the recipients of many handsome presents.

OBITUARY.

We regret to announce the death of Mr. JOSEPH ORR, Night Caretaker, Telephone House, Edinburgh. On Saturday, Nov. 12, he was suddenly taken ill whilst on duty, and had to be conveyed to the Royal Infirmary, where he died on the evening of the following Friday, the cause of death being ulcerated stomach. Mr. Orr, by reason of his quiet and kindly manner, had won favour with all members of the staff.

We regret also to record the death of EDWARD SIMON, Building Attendant, Liverpool, who was killed on Nov. 22 in a liftway of the Company's Exchange, South John Street, Liverpool. He had finished cleaning the lift and was ascending in it when he noticed some oil on the small window in the lift. He got off at the first floor for the purpose of cleaning the back of the window. The lift and balance weight cross each other in front of the window on the first floor, and about two feet above the sill is an iron cross-stay. Simon appears to have got off the top of the lift on to the window sill, and then instructed the lift attendant to bring the lift up a bit. Whilst this was being done, Simon by some means got struck by the ascending balance weight, and was jammed by the head between it and the cross-stay. When extricated, the unfortunate man was found to be dead, having sustained a fracture of the skull.

LOCAL TELEPHONE SOCIETIES.

Bath.—The second sessional meeting was held on Nov. 2, when Mr. T. O'C. Parnell, Chief Inspector, lectured on "High Tension Electrical Discharges." The lecture was illustrated by "X" ray and wireless telegraphy apparatus, vacuum tubes, rotating discs, etc., etc.; 97 per cent. of the members were in attendance and followed the proceedings with great interest.

Belfast.—A general meeting of the staff was held on Oct. 17, and it was agreed to form a telephone society. The following officers were elected for the session 1910-11:—Hon. president, Mr. F. Cowley; president, Mr. J. D. W. Stewart; vice-presidents, Messrs. H. H. Broomhead and A. R. Pulford; hon. secretary and treasurer, Mr. J. W. Holmes; committee, Misses Speers and Richie, Messrs. D. Kernaghan, C. Boyce and W. P. Stanfield.

Birmingham.—The first meeting of the session was held on Oct. 10. Mr. Coleman was in the chair and distributed the certificates obtained by the successful Correspondence Class students last session. He made a few remarks appropriate to the occasion, emphasising especially the importance of technical training. Afterwards a paper was read by Contract Officer T. Rooke on "Contract Work," dealing with the difficulties and pleasures of the work a contract officer is called upon to do. An interesting discussion followed.

The second meeting of the session was held on Nov. 4, Mr. Maclure being in the chair. An admirable paper on "Double Lamp Clear," was read by Mr. Cornfoot, Chief Electrician, and an interesting discussion followed.

Birmingham Operators.—The second meeting of the session was held on Nov. 17, Miss G. Borg, Monitor, being in the chair. Mr. W. B. Benham, Assistant Traffic Manager, London, delivered a paper on "Junction Working in the Metropolitan Area." The lecture was illustrated by a number of diagrammatic slides which proved most interesting. There was a discussion afterwards which, unfortunately, had to be short on account of Mr. Benham's having to leave for London the same evening. There was a good attendance of members.

Bristol.—The first meeting of the session was held on Oct. 27, when Mr. F. W. Roberts, of the Inventory staff, read a paper on "Development." Mr. E. L. Preston was in the chair, supported by Mr. Dalzell, the Provincial Superintendent. Mr. Perkins, the District Manager, very kindly operated the lantern. Mr. Roberts' paper was listened to with great attention.

The second sessional meeting was held on Nov. 17, when a paper was given by W. H. Butler on "Private Branch Exchanges." The lecturer dealt in a very able manner with the intricate circuits necessary for this class of exchange, and illustrated his remarks by means of diagrams. Mr. Preston, Engineer, occupied the chair, and he was supported by Mr. R. A. Dalzell, Provincial Superintendent.

Bristol Operators.—The first sessional meeting was held on Oct. 27, when an address was given by Mr. R. A. Dalzell, Provincial Superintendent, on "The Ineffective Call, Distribution of Loads, etc." Mr. Dalzell set out in a lucid manner the loss caused to the subscriber and the Company through ineffective calls. Various points of the paper were much appreciated by the staff and a good discussion ensued. Mr. Alfred Perkins, District Manager, presided over an attendance of 63.

The second sessional meeting was held on Nov. 17, when a paper was read by Mr. N. B. Noble, Exchange Manager, Bristol, on "Service Observations." Mr. Noble emphasised the value of these observations and pointed out that they were not used in any way to detect individuals, but to eliminate weaknesses in the service and handicaps to the operators. A very animated discussion ensued, several of the operators taking an active part. Mr. Alfred Perkins, District Manager, presided.

Brighton.—The general meeting was held on Sept. 15, when arrangements were made for various papers to be given during the session. Mr. Chaplin, the secretary, having been transferred to Liverpool, a vote of thanks was passed to him for his services, and Mr. Parsons was elected secretary in his stead. Mr

C. J. Phillips (Provincial Superintendent) was re-elected president and Mr. C. F. Moorhouse (District Manager) vice-president, and the following were elected as committee:—Messrs. G. Dowman, H. Drury, F. J. Frost, H. Hatton, W. Knight, E. V. Oates, D. Wallace, E. H. Elliott and W. Jenkins.

A meeting was held on Oct. 31, when Mr. F. J. Frost, Traffic Manager, gave an interesting lecture on "Notes on Traffic Study." The subject was illustrated by a number of lantern slides, and the lecture was followed by a short discussion.

Bournemouth.—The second meeting of the season took place on Nov. 9, when Mr. Plummer gave his paper on "The Testroom." Mr. L. Hunt, who occupied the chair, was well supported by 35 members. Mr. E. S. Plummer very ably explained the various duties that the Bournemouth test clerk has to carry out, and after he had concluded the discussion was carried on by Messrs. Moore, Blewdon, Young, W. Howe (District Manager) and others.

Cardiff Operators.—The first meeting of the session was held on Oct. 25, taking the form of a competitive night. Five papers were given by senior members of the society. The chair was taken by Mr. Williamson, Local Manager of Newport, who, after making the opening speech, took the opportunity of introducing to the society the new District Manager, Mr. H. Davis. The papers given were of exceptional merit, bringing out many important points. They were entitled: "Junction Working," by Miss S. E. Thorn; "Testing Operators' Duties," by Miss H. C. Van Riel; "Operating Irregularities," by Miss L. Wheeler; "Team Work and Supervision of Calls," by Miss A. M. Whittle; and "How the Monitorial System Helps the Operator," by Miss A. Bryant. The first prize was awarded to Miss H. C. Van Riel; the second to Miss S. E. Thorn; and the third to Miss L. Wheeler.

Cardiff.—The first meeting of the session was held on Oct. 20. Mr. Whetton was in the chair, and there was a good attendance. Mr. R. A. Dalzell, Provincial Superintendent, read a paper before the society, entitled "Traffic and the Value of the Telephone Call as varied by the Degree of Efficiency of each Individual Member of the District Staff." The paper, which was illustrated by diagrams, was thoroughly appreciated by all present.

Cheltenham.—Attention is drawn to the fact that at the meetings on Feb. 9 and March 23, 1911, awards will be given for the best papers given by operators and linesmen respectively. The awards will be made by the vote of the meeting, all the papers being read by the chairman, to conceal the identity of the writers. The reading of the papers is frequently the principal obstacle to bashful members of the societies, and this scheme will, at any rate, induce some to contribute to the meetings who would otherwise be unwilling to do so.

Cork.—The second meeting was held on Nov. 17. Reports of the past session's work and business were read by the secretary and treasurer. The president (Mr. Roy) made a few remarks, and then called on Mr. Hay to read his paper on "Measured Rate Recording in the Office." The paper proved very interesting, and the part of the ticket in the office was dealt with in detail. A few remarks were also made regarding its travels before reaching the office. The meeting terminated after a discussion entered into by Miss Gallagher, Mr. Roy and Mr. Lynn.

Coventry.—The following are the principal officers:—Hon. president, Mr. A. Coleman; president, Mr. Jno. Mewburn; vice-president, Mr. R. S. Grosvenor; hon. sec. and treasurer, Mr. W. H. Oliver, District Office, Coventry. On Nov. 24 Mr. H. P. Lloyd will read a paper on "Transmission."

Dover.—The second meeting was held in the district office on Nov. 15, when papers were read as follows:—"Definition of a Good Service," Miss L. A. Barker, Clerk-in-Charge, Folkestone; "'B' Operating from an Operator's Point of View," Miss G. M. Williams, Operator, Folkestone; "Party Line Operating," Miss N. Argar, Operator, Folkestone; "Management of a Sub-Exchange," Miss J. Argar, Operator, Cheriton. Discussion took place at the conclusion of each paper. There was a total attendance of 31, being 44 per cent. of the members, and fourteen other members of the staff.

Edinburgh.—The opening meeting, presided over by the late District Manager, was held on Nov. 7, and was attended by a large number of the staff. Mr. B. S. Cohen, of the Head Office, gave a lecture, illustrated by lantern slides, on "Transmission." The interest taken in the society by the members generally is indicative of a successful session.

Exeter.—The telephone society has started its 1910-11 session with two very successful meetings, the papers, "The Securing of Telephone Contracts" by Mr. J. Ritchie, and "Sidelines on Operating" by the Operators, being greatly appreciated. A library and other features are in course of formation.

Gloucester.—The session opened with a splendid attendance on Nov. 9, under the chairmanship of Mr. F. W. Sceats, vice-president. Mr. C. Elliott, District Manager, gave a very instructive and interesting paper on "District Office Work," dealing with expenditure and allocation, and explaining with a number of curve forms the method of arriving at and governing expenditure in the various centres. Interesting discussions followed, and a successful session is being looked forward to. Mr. C. Elliott is offering two prizes for the best competitive papers given on "Operating, Electrical and Clerical Work," and Mr. F. W. Sceats one for "Line Work." Mr. S. G. Hare has resigned the position of secretary and treasurer and Mr. W. G. Jack has been elected in his place.

Hastings and Eastbourne.—The first meeting of the present session of this society was held at Hastings on Nov. 2, when Mr. H. Hatton, of Brighton, gave a very interesting paper on "Accumulators." Mr. T. J. Hickmore occupied the chair in the unavoidable absence of Mr. Curling, the Local Manager.

Hull Telephone Society.—The second meeting was held on Nov. 14, when an excellent paper was read by Mr. Green (Head Office staff) on "Cable Design," illustrated by lantern slides. The lecture was extremely interesting to those members of the society who have the handling of cable.

Isle of Man.—The third meeting was held on Oct. 28 at Rosebery Chambers, Douglas. The District Manager opened the meeting by showing some interesting figures as to time allowed and actual time spent on instrument visits and clearing faults. In the absence of Foreman Smith through illness, Wireman King read his paper and showed some most interesting points in the repairing of twisted wires, etc. A keen discussion took place after the paper had been read.

Leeds.—Meeting held Nov. 16, Mr. W. R. Senior presiding, the speakers being Miss Dransfield and Mr. E. J. Gillett. Miss Dransfield's subject was "First Aid." This was considered in its general aspect, and also in its specific application to accidents to which the company's staff may be liable. Mr. Gillett dealt with "The Distribution and Recording of Underground Cable," illustrating his remarks with diagrams. The membership is larger than ever before, whilst the attendance at this meeting constitutes a record and gives good hopes of a successful session.

Liverpool and Birkenhead.—The first meeting of the session was held on Oct. 20, Messrs. R. Shepherd, T. A. Prout and E. S. Francis (past presidents of the society) being present. Mr. O. G. Lee, president, addressed the meeting. His association with telephone work covered a period of eighteen years, and for many years he had been an enthusiastic member of telephone societies. Mr. R. Shepherd (Provincial Superintendent) congratulated the society on their selection of a president, and in an interesting address made special mention of the extremely valuable work—valuable to the Company and to its servants—which was being carried out by the telephone societies. The distribution of silver cups, awards and certificates obtained in connection with the Company's Correspondence Classes was then proceeded with, Mr. Shepherd having kindly consented to undertake the presentations. The two silver cups (the gift of Mr. G. H. Robertson) were presented—to be held for one year—to Messrs. E. H. Morgan and H. B. Carroll for successes in the Correspondence Classes, the society also awarding to the former a gold medal, and to the latter a silver sovereign purse (Mr. Carroll having been awarded the society's medal last session). The remainder of the evening was occupied in a miscellaneous lantern lecture, including the following:—"Exchange Equipment" and "Line Work," kindly lent by the Engineer-in-Chief; "Gerrard Exchange, etc.," Mr. R. Shepherd; "Underground Construction, etc., in Ireland," Mr. Graham; "Nature under the Microscope" (photographs by Mr. W. K. Wood), together with photographs of members of the Liverpool electrical staff in the "early days," etc., etc., Mr. Wood.

Liverpool and Birkenhead Operators.—The first meeting was held on Oct. 11, Mr. Hidden presiding, when (at the special request of the society) Mr. Francis, Traffic Manager, read a paper on "Supervision." The paper was greatly appreciated, much valuable instruction being conveyed. The rendering of a few musical items brought the meeting to an agreeable conclusion.

On Nov. 11, Mr. C. W. Diggott, Traffic Manager, of Birmingham, read a most interesting paper, entitled "Past and Present," illustrated by a number of lantern slides. A short musical programme terminated a very enjoyable evening.

Luton.—Mr. J. H. Wilson (District Manager) opened the 1910-11 session on Oct. 24 by giving an interesting lecture on "Points for Consideration." He repeated the lecture at Watford on Oct. 31. An interesting syllabus has been prepared.

Manchester.—The first paper of the session was read by Mr. H. Green, Engineer-in-Chief's Department, on Oct. 21, the chair being taken by the vice-president, Mr. G. F. Staite, in the absence of the president, Mr. W. Cleary, who has been transferred to the Inventory staff. Mr. Green gave a description of the cables in use by the Company by showing the proportionate value of conductors to total cost of L. C. cables, relation of diameter of conductor and diameter of cable, tensile strength tests, adaptability of coloured pairs for identification purposes, also comparisons of pure lead and alloy lead and tin sheaths, tension in cable hauling, etc.

The second paper of the session was read by Mr. G. F. Staite on Nov. 11, the subject being "Exchange Supervision," the Engineer, Mr. A. Magnall, presiding. Mr. Staite divided his subject under three headings, the object of supervision, means, and application of means, and illustrated by curves shown on lantern slides the improvement in operating, i.e., the load dealt with by individual operators and the increase in revenue due to the introduction of supervision.

Nottingham.—A social evening to inaugurate the fourth session was held in the Huntingdon Street Schools on Oct. 28. An interesting musical programme was contributed by members of the staff. The chair was taken by Mr. H. Saywell. New members were enrolled for the session and the Correspondence Class certificates distributed.

Nottingham Factory.—The first meeting of the session took place on Oct. 21, Mr. Fenton presiding; 65 present. After a few preliminary remarks from the president, the official reader was called upon to read six papers sent in in connection with the "Ten-Minute Paper Competition," the names of the authors being kept secret until after the result of the ballot for prizes had been declared. The object of the competition was to encourage those who felt they were not yet qualified to attempt a paper of longer duration. Three prizes were offered, totalling 10s., divided *pro rata* to the number of votes received. The papers were most interesting, the following being their titles, and the prizes were obtained by the first three in the order named:—"The Improved Efficiency of the Hand Micro-telephone," "Practical French Polishing," "Ten Minutes in a Plating Shop," "The Object of the Correspondence Classes," "Keeping Wood-working Tools in Order," "A Complete Electro-Plating Plant" (illustrated). During the counting of the votes Mr. Fenton emphasised the importance of the Company's Correspondence Classes and also the local University College Classes in telephony, especially in view of the near approach of the transfer of the telephone undertaking to the Post Office.

North-East London.—The first meeting of the session was held on Oct. 24, when (owing to the absence of the president, Mr. H. S. Peck, on the Inventory staff) Mr. F. Morley Ward kindly read a very instructive paper entitled "Ringing Dynamotors and their Uses," in the course of which he explained the construction and wiring of the machines, and how the various signals and tones were obtained, also the theory of party line and harmonic ringing systems. A new feature is being introduced this session by inviting members to send in notes of any difficulties with regard to their daily work, technical or Correspondence Classes, which are discussed at the ensuing meetings.

Portsmouth.—On Nov. 4 the opening lecture was given by Mr. Stanley Wainscot on "High Tension Electricity." It was illustrated by numerous

experiments with a large Wimshurst machine (constructed by the lecturer) and several experiments with Franklin's condensers, C' spark induction coil, vacuum tubes, etc., and about 24 lantern slides illustrating freak lightning conductors and the effects of lightning discharges, and an illustration of the false security of a badly erected so-called "lightning conductor." One feature of the lecture was the words "Success to the Society," picked out in small sparks connected across the terminals of the Wimshurst machine.

Plymouth.—The opening meeting took place on Nov. 9, when the president, Mr. R. A. Dalzell, gave a very interesting opening address, which was followed by a paper entitled "Economics," given by Mr. E. S. Byng, of the Inventory staff. Mr. Byng dealt ably with the subject and made it most interesting.

Sheffield.—The first meeting was held on Oct. 19, when, after the president's address, papers were read by Messrs. W. Thyne and A. Broomhead on "The Relationship of the District Office to Other Departments of the Company," and Messrs. H. G. Rowe and W. Burnett on "The Instrument and Service from the Point of View of the Subscriber and the Company." The chair was taken by the president, Mr. W. Thyne. There was a fair attendance and the papers were discussed at the close of the meeting.

The second meeting was held on Nov. 16, when a paper was read before a good attendance of members (over 85 per cent. being present) by Mr. J. Scott, the Assistant Provincial Superintendent, on "Notes and Comments on Management." The chair was taken by the District Manager, Mr. R. C. Bennett. The paper was thoroughly enjoyed by those members present, the subject was treated so broadly that discussion was somewhat limited.

Sheffield Operators.—The first meeting was held on Oct. 27 and took the form of a whist drive. A very enjoyable evening was spent, 148 members and friends were present, only one prize, however, came to the staff, this being the ladies' first prize, which was won by Miss H. Mettam. Mr. S. R. Vaughan (Exchange Manager) took the duties of M.C.

The second meeting was held on Nov. 17, when the president, Mr. E. J. Johnson, gave his presidential address before a fair attendance of the operating staff. Discussion took place at the close of the meeting on points referred to in the address.

Southern London.—This society held a very successful meeting at the Hop Exchange on Nov. 2, when a paper on "Line Maintenance" was read by Mr. J. Hayes, with Mr. Woollard, D.M.E., kindly undertaking the duties of chairman in the absence of the president. By dealing with the subject in a practical way the point of view of the fault-finder was emphasised and with the aid of many slides his difficulties pointed out.

Southampton Operators.—A society has been formed and a syllabus prepared covering various phases of traffic. The president is Mr. W. Howe; vice-presidents, Messrs. J. Gwyer and S. O. Allen. The lecturers for the session 1910-11 are Misses Smith, Starkey, C. G. Haynes and L. H. Haynes, Southampton, and Miss C. Harper, Bournemouth, Messrs. J. Gwyer, E. Quinn, A. Wilson and S. O. Allen, Southampton. The inaugural meeting is fixed for Nov. 28, to be followed by a social evening at the Grosvenor Restaurant.

Sunderland and South Shields.—The first monthly meeting for session 1910-11 was held at Sunderland on Oct. 26, Mr. E. Spink presided. The election of officers took place and the following were duly elected:—Hon. president, Mr. A. L. E. Drummond; president, Mr. W. J. Douglass; vice-president, Mr. J. G. Dixon; hon. secretary and treasurer, Mr. Thos. E. Thompson; committee, Messrs. E. Spink, R. Guthrie, J. Smith and J. Martin. The rest of the evening was devoted to a discussion on "Telephone Matters." The new proposed P.O. automatic operating, the P.O. telephone developments at North Shields, and other items regarding telephone work were discussed.

Swansea.—The second sessional meeting was held at the Docks Exchange Hall on Nov. 16, Mr. W. E. Gauntlett (District Manager) occupying the chair, when a very interesting and instructive paper, entitled "Some Notes Concerning the Maintenance of Primary Batteries," was given by Mr. A. L. Stanton (Acting Electrician). Important points relative to the making up and maintenance of local batteries were dealt with, and the need for the carrying out of efficient tests emphasised. The paper provoked an animated discussion, in which several members took part. There was a very good attendance, 72 per cent. of the membership being present, together with eleven visitors.

Swansea Operators.—The second sessional meeting was held at the Docks Exchange Hall on Nov. 9, when two excellent papers were given by Mr. A. G. Bristow (Traffic Manager) on the following subjects:—"A Chat to the Swansea Operating Staff" and "A Trip Across America" (illustrated by lantern slides). The first paper dealt with the position and progress of the Swansea operating staff individually and collectively, pointing out the aims and ideals essential to success and the means of attaining the same. The short but interesting lecture which followed was illustrated by some excellent views of the most famous cities and scenery of America.

Tunbridge Wells.—A social evening in connection with the above was held at Ralph's Restaurant, Tunbridge Wells, on Oct. 19, and a most enjoyable evening was spent. During the evening the vice-president announced the programme for the coming session of the telephone society, a feature of which will be discussions on matters dealt with in the Correspondence Classes, which will follow the reading of the usual papers. The secretary intimated that a series of prizes had been promised for the best papers read.

Western Metropolitan.—The opening meeting of the 1910-11 session was held at Gerrard Exchange on Oct. 27, on which occasion Mr. W. E. Cardon read a paper on "Central Battery Intercommunication Telephones Ashore and Afloat." Lantern slides were shown to illustrate the circuits, and the paper proved very interesting.

Wolverhampton.—The first meeting of the session was held on Nov. 11, when Mr. H. G. Watkin, of Hanley, gave some practical demonstrations of wireless telegraphy and "X" rays. His lecture and experiments were closely and enthusiastically followed by an audience of 52. Mr. Archer W. Smith, District Manager, occupied the chair, and before the lecture he distributed the certificates (25 in all) to the members who had gained them in connection with the Correspondence Classes of last session.

STAFF GATHERINGS AND SPORTS.

Cork.—A social evening and dance was held on Oct. 28, under the auspices of the telephone society, when a company of 60 of staff and friends spent a very enjoyable evening. The following officers have been appointed for the ensuing session:—President, Mr. J. Roy; vice-president, Mr. A. Lynn; treasurer, Mr. G. Henry; secretary, Mr. W. Patterson; committee, Misses Gallagher and H. Peard, Messrs. W. Clifford, P. Clifford and H. Hay.

Manchester.—The C.D. Club held their first meeting for the session 1910-11 on Oct. 10. There was a capital attendance of members, and the proceedings started with a tea, followed by a good musical programme. Mr. Elliott was in the chair, and in his opening remarks gave a short *resumé* of the work of last session. Mr. Magnall, District Engineer, and Mr. Staite, Traffic Manager, were the guests of the evening. Added interest was attached to the proceedings by the presentation of wedding gifts to Messrs. Dawes and Ellis, consisting of a salad bowl and Sheraton clock respectively, subscribed for by the members of the contract staff.

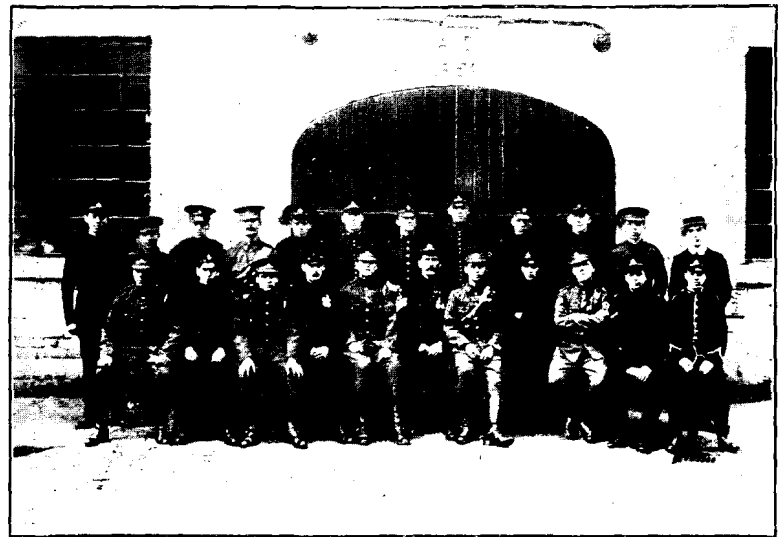
Swansea.—A whist drive and dance in connection with the Swansea Operators' Society was held at the Hotel Grosvenor, Swansea, on Oct. 28, when a gathering of about 80 members and friends spent a very enjoyable evening. The prize winners at whist were: first prize, ladies, Miss C. Johns; gentlemen, Mr. W. Allen; consolation prize, ladies, Miss M. Roach; gentlemen, Mr. Parnell. Dancing was commenced at 10.30 p.m. and continued until one o'clock, at which hour the company dispersed, delighted with the success of the gathering.

Plymouth.—The Plymouth and Inventory staffs and other friends, numbering 100, spent a very enjoyable evening on Nov. 12 at Goodbody's Café, Plymouth, the function being a whist drive and dance. The prizes for whist were secured by the following:—Ladies, first, Mrs. Thorn; second, Miss Page; consolation prize, Miss A. Ellis. Gentlemen, first, Mr. Hague; second, Mr. W. M. Hannaford; consolation prize, Mr. R. Thorn. The evening was an entire success, thanks to the efforts of Mr. C. E. Drabwell and Mr. W. E. Walter, who acted as M.C.'s, and to the organising committee.

Brighton.—The Brighton staff held a whist drive and dance at the "Bon-Bon" Shop, Preston Street, on Nov. 16, when 76 members of the staff and friends were present. Mr. H. Drury acted as M.C., assisted by Miss Trot, Miss Agutter, Mr. E. J. Clarke and Mr. W. Jenkins, the latter of whom also assisted as dance M.C. The prizes were distributed at the close by Mr. C. F. Moorhouse, District Manager, and a vote of thanks was passed to the M.C. and those who assisted. Mr. K. Curling, Local Manager, Eastbourne, Mr. T. R. K. Rogers, of the Head Office audit staff, and Mr. Vaughan, of the Brighton Post Office, were among the visitors taking part in the drive. The prizes fell to Miss M. McManns, Miss M. Webb, Mrs. G. Gunning, Mrs. Drury and Messrs. B. Britt, W. Tyler and R. H. G. Houndle.

Great Yarmouth.—On Nov. 5 a football match took place at Yarmouth between the Norwich and Yarmouth staffs. The Norwich team had most of the play and won easily by three goals to *nil*, thus recapturing possession of the "Megohm" cup. The goals were scored by W. Parish (1), and A. J. Balls (2), both district office clerks. An enjoyable tea and smoking concert, presided over by Mr. J. D. Pugh, Local Manager, pleasantly terminated the day's proceedings.

[Several reports of Staff Gatherings are held over until next month owing to lack of space.]



THE above photograph represents a group of Territorials, who, with seven others, form Nottingham Factory's contingent towards Home defence.

The following are represented in the group: Royal Horse Artillery, Yeomanry, Robin Hoods (Seventh Battalion), Eighth Battalion Notts and Derby Regiment, Field Ambulance, R.A.M.C.

There is no Engineers' corps available near Nottingham, otherwise the number would probably be greater.