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## TELEPHONE MEN.

### LIX.—CHARLES SKAIFE WOLSTENHOLME.

CHARLES SKAIFE WOLSTENHOLME was born at Ripon, a small cathedral city in Yorkshire, and educated at the Grammar School in that town and in the Engineering Department of the Yorkshire College, Leeds (now the Leeds University), under Professor Goodman. At the age of seventeen Mr. Wolstenholme entered the engineering shops of Messrs. Hudswell, Clark & Company, locomotive engineers, Leeds, and after five years' training in the machine shops, fitting bench, drawing office and erecting shop he acquired further drawing office experience at the Leeds Steel Works, where he remained four years.

Whilst at the steel works he secured a position as assistant engineer on a railway in Assam, and the agreements were on the point of completion when a junior appointment was offered him in the National Telephone Company at Leeds under Mr. Prout, who was then District Manager, Mr. Swithinbank being the Local Manager. Here Mr. Wolstenholme obtained an insight into the various branches of the Company's work, including the process of opening new exchanges from the signing of the agreements for the new lines through the different steps up to and including the completion of the work. He also gained some experience in underground work as the Leeds scheme was just then commencing.

Mr. Wolstenholme was subsequently given control of the installation of the underground plant at Harrogate, the work being carried out by Messrs. John Aird & Sons. Here steel distributing poles with ornamental cast-iron bases were largely used. These were placed in the footway and designed with the intention of their being adapted as ventilating shafts, an arrangement required by the Harrogate Town Council who granted the wayleave. As soon as this arrangement became public property it was the cause of some concern. The council evidently saw trouble ahead and decided that the sewers should not be joined up to the poles until a twelve-month after their erection. People residing near the new standards began to imagine that the new public ventilators prevented their

opening their windows owing to the abominable smells they emitted. Explanations were in vain, and it was only when an assurance that the sewers were not yet connected with the poles was given by the town authorities that the complainants could be satisfied.

On Mr. Swithinbank's promotion to Middlesborough, Mr. Wolstenholme was appointed Local Manager at Leeds in 1898. During his term of office the following exchanges were opened:—

Burley-in-Wharfedale, Menston, Wetherby, Boston Spa and Guiseley, and extensive underground schemes carried out at Stanningley, Morley and Roundhay, in addition to extensions to the original lay-out of the Leeds underground scheme.

In 1904 Mr. Wolstenholme was appointed District Manager of East Kent with headquarters at Canterbury. It was realised that in such districts as this it was imperative to open up new ground if there was to be a steady increase of stations. Whilst he was in the district, therefore, new exchanges were opened at Sturry, Kennington, Kearsney and Eastry, whilst arrangements were in progress, before he left, for opening at Bridge, Selling and Willesborough. Underground schemes were carried out at Folkestone and Ramsgate with the object of providing metallic circuits in place of earth circuits and of relieving congested routes. At the same time underground extensions were being carried out at Dover.

In 1906, following upon the retirement of Mr. Thomas Rowe, Mr. Wolstenholme was promoted to the position of Engineer at Liverpool, and in July, 1910, the Birkenhead district was amalgamated with Liverpool and was added to his charge. During his period of office at Liverpool the new Bank Exchange was opened in that city in 1909, and in 1910 exchanges were opened in the Company's own premises at Bootle, Anfield and Wavertree, all entailing considerable underground work in the cutting-in of existing circuits from the old premises to the new.

On the formation of the Inventory staff in the autumn of 1910



Mr. Wolstenholme was selected as a Divisional Officer, and is still acting in that capacity.

Mr. Wolstenholme generally surrounds himself as far as he is able with a well-trained staff, and is a good disciplinarian.

As a bachelor he cultivates the social side of life, has given several years to Volunteer work, and among his recreations is lawn tennis. He is now an ardent golfer.

## THE FORTY-SEVENTH ORDINARY GENERAL MEETING OF THE NATIONAL TELEPHONE COMPANY.

At this meeting, held on Feb. 23, the PRESIDENT (Mr. Franklin) said that the report and accounts for the half-year ended Dec. 31 last, were in every respect the most satisfactory which had been presented to a half-yearly meeting of shareholders, either by himself, or by his predecessors.

In spite of the restriction of capital expenditure due to the shortly terminating period of the licence, the results indicated at all events the Company's determination, whatever else it did, to fulfil its duties to the public, and so there had been added to the Company's system, during the past half-year, some 14,324 stations, or during the whole year 30,610 making a grand total of 534,253 stations to which the telephone was attached. And although it was true that these additions were largely accomplished as the result of using up what was known as the spare capacity of the plant, it was evident that the result of it would be to hand over to the Postmaster-General, when the transfer took place, a very much larger income than would otherwise have been the case, and as the Postmaster-General would not have it in spare plant, he would have it in income, which he might or might not prefer.

The income accrued in respect of the business of the half-year was £1,744,111 as compared with £1,599,990 in the corresponding period, giving an increase of £144,121. Then the deduction of the Post Office royalties £167,613, as compared with £153,857, an increase of £13,756, left as the net income £1,576,498, as compared with £1,446,133, an increase of £130,365.

Coming to working expenses, which, like the poor, were always with them, they found that the working expenses for the half-year amounted to £1,015,442, as compared with £922,692, or an increase in expenses of £92,750. The net result for the half-year was an increase of £37,615, and to those shareholders who were curious and would like to see how that extra amount had been dealt with, he would suggest that they should add it to the increase in the amount brought forward, £2,367, and they would then get a total of £39,982. That had been disposed of by an increase in the interest on the reserve fund, £9,574, an increase in the transfer to reserve, as compared with the corresponding half-year, of £30,000, and an increase in the amount carried forward of £408, making up the total of £39,982.

It had often been explained that their business for some reason or another did not lend itself very well to divisions into equal half-years, and so it was that their June half-year, which to some extent was in the nature of an estimate, was never quite comparable with the December half-year, and therefore they would probably find it more convenient to look at the figures for the complete year. Income accrued in respect of the business of the year, £3,422,423, as compared with £3,149,126, or an increase in income of £273,297. Post Office royalties, £329,494, as compared with £302,984, an increase of £26,510.

Here he might pause for the purpose of saying that that made up a sum of about £3,500,000, which had been exacted from this Company and its predecessors by the Government since the license was granted, which millions had been taken from them without any services at all to the Company in return, unless perhaps it revealed itself in Dreadnoughts and other things in which the shareholders of this Company were not exclusively interested.

The net income was £3,092,929, as against £2,846,142, giving an increase of £246,787. Working expenses £1,987,357, as compared with £1,813,491, an increase of £173,866, as to which he proposed to say a few words to them presently, leaving the net result for the whole year, £1,105,572, as compared with £1,032,651, an increase of £72,921.

Maintenance and renewal of lines and instruments and depreciation allowances were £373,725, as compared with £338,607, or an increase of £35,118 in the half-year.

The increase during the twelve months had been over £80,000, which meant that during the year 1910 they expended £80,000 more than they did in 1909 upon the maintenance of the Company's plant. That, he thought, disposed effectually of the foolish prediction that the policy of the Company would no doubt be to run down its plant and to spend little or nothing upon maintenance, so that the Postmaster-General might take over an attenuated concern. That had not been the policy of the Board, who regarded it as of the highest importance, alike to the shareholders and to the public, to maintain plant, as far as possible, at the highest point of efficiency.

The increase in the percentage of working expenses to net income, which shareholders would notice had increased from 63.80 to 64.41, was due to the class of expenditure to which he had referred, that was the increase in the provision with regard to the maintenance of plant, and also to the next item, on which he wanted to give them a little information.

The special expenditure which called for comment was in net revenue account No. 3, and appeared for the first time. It was inventory and arbitration suspense account, £25,000. That was a new item of expense, and represented in round figures the amount expended by the Company up to Dec. 31, 1910, a period of about three months, in the taking of an Inventory, and it was subject to

adjustment as between the Company and the Postmaster-General under an arrangement made with him, to which it might be convenient if he now referred.

At the last half-yearly meeting he mentioned the fact that the absence of an agreement with the Postmaster-General as to the value of the Company's assets would involve that such value would have to be determined by arbitration, and that the Company's officers were then engaged upon preparations for an Inventory upon which the Company's claim would ultimately be founded. The taking of this Inventory was a huge task, and was expected to occupy a staff of about 450 persons drawn from the Company's officers for a period of about fifteen months. The work commenced in October last, and by agreement the Company had arranged for the checking of such Inventory as it proceeded by the staff of the Postmaster-General, who had appointed about 200 persons for that purpose. This work was now proceeding in various parts of the United Kingdom, and in its results should produce a satisfactory enumeration of the plant, agreed to by the Post Office, with whom it was also hoped to be able to settle the question of the age of the plant, leaving for later determination and subsequent negotiations the all-important questions of the cost of construction, and the proper amount to be allowed for depreciation. With all these factors the Company would be able to prepare its claim for the Arbitration Tribunal, if necessary, and the Railway and Canal Commissioners, who were the authority who have to determine differences as between the Company and the Postmaster-General.

The entire expenses of taking the Inventory by the Company's staff and of checking it by the Postmaster-General's staff were, under the agreement, to be added together and divided equally between the Company and the Postmaster-General.

In connection with the taking of this Inventory, few shareholders had any idea of its magnitude and the worry and the trouble and the perplexity that it involved, and it is only due that he should say of their Engineer-in-Chief, Mr. Gill, and of the Company's staff who had helped him in this work, how very much the Company appreciated the admirable work done in the preparation of the scheme and the plans for the taking of the Inventory, which gave evidence of care and forethought contributing to the smooth working which had been so far experienced.

When it was remembered that the Inventory staff of 450 were mostly taken from the various districts, whilst those remaining had much heavier and more onerous work in consequence, the extent of the Company's call upon its officers and staff might be the better understood, and the Board had much appreciated alike the response of the staff and the spirit which has prompted it, a spirit of which any business enterprise might justly be proud.

The Board had hoped that some arrangement might have been possible by which this enormous task might have been lightened, and the future development of the telephone service more rapidly secured, but as the Postmaster-General has not felt at liberty to agree to any course obviating the necessity for arbitration, the Board deemed it of the highest importance to proceed as rapidly as possible with the enumeration of the plant, which, as he said, would be the basis of their claim and would probably be adjudicated upon by the Railway and Canal Commission.

Mr. T. W. STEPHENS said he would like, in proposing a vote of thanks to the President, to join the staff and all connected with the Company for their splendid and zealous service. (Cheers.)

Mr. T. W. KELLET seconded that.

THE PRESIDENT said it was an extremely satisfactory thing to have those votes of thanks, especially when they were arriving at a time when the interests of all shareholders might not be exactly the same. They had seen that day that no end of questions might arise on the division which might ultimately take place, yet, on the other hand, it was satisfactory to know that the Board had the entire confidence of the shareholders behind them. They appreciated very much those expressions which shareholders enforced from time to time, and the Board would in the future, as in the past, endeavour to do their best in what was an extremely difficult and anxious business. He entirely agreed with every word that Mr. Stephens said with regard to the staff. The staff of that Company, as he said in his opening speech, deserved a great deal more than they got in the way of appreciation of the value of their services, given with a fine spirit on behalf of the Company in which they all of them took great pleasure and great pride. On their behalf as well as on his own, he begged to thank them.

## INVENTORY OF PLANT.

The following additions have been made to previous lists:—

TRAVELLING STAFF.			
Aylesbury, W. H.	..	Instrument Inspector	.. .. Cardiff.
Brown, A.	..	Instrument Fitter	.. .. Glasgow.
Coltart, A.	..	Instrument Inspector	.. .. Glasgow.
Driffill, J. W.	..	Instrument Inspector	.. .. Hull.
Evans, R. S.	..	Wireman	.. .. Bristol.
Futter, H. J.	..	Chief Fitter	.. .. Dublin.
Gairn, J. B.	..	Instrument Inspector	.. .. Edinburgh.
Kirkham, E. C.	..	Instrument Department	.. .. Liverpool.
Leahy, J. A.	..	Instrument Department	.. .. Liverpool.
Lumsden, A.	..	Fitter	.. .. Glasgow.
McGraw, F. S.	..	Instrument Inspector	.. .. Leeds.
Niemann, P. S.	..	Instrument Inspector	.. .. Leeds.
Taylor, G. J.	..	Lineman Inspector	.. .. Cirencester.
Tilt, A. H.	..	Exchange Inspector	.. .. Birmingham.
McMillen, D.	..	Assistant Test Clerk	.. .. Dublin.

## HEADQUARTERS.

Jameson, J. C.	..	Clerk (General Supt.'s Office)	.. .. Head Office.
Lynn, Alex.	..	Chief Clerk	.. .. Cork.

## TIME AND MONEY.\*

BY EUSTACE HARE.

THE financial success of an individual, or of the aggregate of individuals which forms a business body, public or private, depends, not on the number of hours occupied, nor on the quality of the results attained, but on the skilful blending of both; that is to say, on the efficient practical output which each occupied hour yields. I am speaking, of course, of "financial" success only, and of financial success to the immediate person or persons concerned; for there are other phases of success where the rule I have suggested would not apply. There is, for example, the posthumous success of the artist or musician born a decade or two before his time; there is the success of the discoverer or inventor who spends his life in perfecting his work and dies in poverty; and on the other side there is the rare child of fortune who by a happy conjunction of uncontrolled circumstances or a lucky throw of the dice achieves in half an hour what better men have lived and worked for in vain. Again, there is the man who thinks he is economising time by cramming into it a vast amount of useless work which neither brings him prosperity nor benefits anyone else; but he is not worth thinking about.

If we are to expect success according to the quality of work completed in the time at our disposal, it would almost appear that the ideal method of remuneration is payment by results, or, in other words, by piecework. Well, I venture to express the view that, given favourable conditions and proper cultivation, payment by results is a fairer and sounder principle than a fixed rate of payment by time. There are, I know, several arguments against piecework, and one of them is that it tends to produce not the best work but equal work. So it does, but the same may be said of timework if we are paid solely for the time consumed. The only complete answer to this proposition is, payment by individual merit, and not only so, but according to the merit of each separate piece of work produced. Obviously an impossibility. Then, piecework is an incentive to speed, by which the more active workman makes the most money, but not necessarily the better article. The slower man may be his equal as to quality of workmanship but financially becomes his inferior, because, being paid by the article and not by the hour, he earns less money in the same time. There is, however, nothing inequitable here, assuming the standard of production is the same in both cases. The man who does the most work, provided it is good and useful, is entitled to the most pay.

In piecework the position of employer and employed though definite, is opposite, for the profit of the employer is derived from the number of articles produced while that of the employee accrues from the speed of production. In other words time is money to the employee but not to the employer; it would only be so in his case if instead of merely paying so much per article he laid down a time limit, which would destroy the essence of piecework.

On the surface, it may seem that piecework denotes a want of confidence, if not an absolute antagonism between the worker and the man who gives him work; that the employer has so poor an opinion of the man he employs that he will not trust him to make the most of the time which he himself pays for, while, at the same time, he is unwilling to incur the expense of the closer supervision which timework necessarily involves. We shall soon drop this idea, I think, if we view the matter from a higher standpoint. It is true that the amount of the workman's wage depends upon his output, but what after all does this mean? It means that there is being put into his work an element of enterprise; he is being placed more on a level with the class of man who, relying solely on his own efforts, has built up his own business—the man who does not and cannot reckon success by the time he gives to his undertaking, but by the results of it, although no one knows better than he that every minute of his working day must be profitably spent. In this sense, therefore, the man who is paid by results compares more nearly with the man who employs him than does he who merely sells his time. Temporarily he becomes a capitalist; the employer advancing capital in the shape of raw material to be converted into

the finished article, to which is added the cost of manufacture, part of which is the workman's profit. And the more capital the workman turns over the greater is the profit he earns. Moreover, the employee has this advantage over his employer; his market is found for him, whereas the employer has to seek one.

It is also apparent that the system is selective, favouring the adept while it penalises the shirker; but who will say that this is an unreasonable position? It only emphasises the similarity between, and the mutual interests of employer and employed. For no employer who hopes to live by his business—and by "living" I mean something more than a hand-to-mouth existence—can afford to waste time or miss an opportunity; can afford to slacken his energies for one moment during the hours dedicated to work.

Universal payment by results (or what is usually recognised as such) is not, however, practicable. You could not reward a soldier according to the number of lives he destroys any more than you could a doctor for the number of lives he saves. It is, mostly, creative men, artists, authors, inventors and so forth, who are paid and live by results; all, in a sense, manufacturers who have to find a market for their wares; producing no two things exactly alike, and thereby making remuneration by time an impossibility.

The strictly professional man is in quite a different position. The man, for example, who conducts a lawsuit for you or against you, wins or loses (assuming, of course, his ability) according to the strength or weakness of the case. What he requires to be paid for is the time and knowledge he puts at your disposal. He did not invent the case, and, in itself, it is of no consequence to him except in so far as he may gain *kudos* from its successful issue. The result concerns the litigant alone, and the importance of the case to him cannot be gauged by the cost which the conduct of it involves; the cost may be, and often is, out of all proportion to the value of the result to either side, greater or less, as it may be.

Take again, the position of the doctor. The notion of "no cure, no pay" is as absurd as it is illogical. A doctor summoned at a critical juncture may by some simple remedy save a life—valuable or otherwise. He is paid his fee (or not) and goes his way. It is not his own life which is concerned, and his interest in it is purely professional. On the other hand, he may be engaged on a case for many months where no serious issue is to be apprehended, but where the lucrative benefits to himself are far more substantial.

It is clear, therefore, that you cannot put a value on knowledge and experience any more than you can measure the baneful effects of ignorance and neglect. When you need the assistance of the trained mind of the specialist you can but reward him for his time. Not, mark you, for the trivial hour or two he dedicates to your wants, but for your share of the cost of those years during which he was qualifying himself for his responsibilities. But you have the right to expect him to observe his part of the bargain; that what he undertakes to do he will do honestly, that he will bring the fruits of his training to your aid, and for the time being will identify himself with your interests. Nothing less than this, nothing less than mutual confidence, conscientious work on the one side and a recognised indebtedness on the other, justifies payment by time.

This, then, seems to me to be the position as regards remuneration for the work of men and women: payment by results where the value of the work can be definitely and accurately gauged by prevailing economic conditions or the exigencies of supply and demand; otherwise, payment by time. Or, shortly, piecework where it is possible, timework where it is not. I am not concerning myself with questions of degree or rates of payment or the comparative merits of individuals, but only with the broad principles by which a money value can be placed on work and time.

Now, there is an aspect of the telephone business which I do not remember ever to have seen clearly expressed and which has not yet, I think, received the full and general attention it deserves. Not only the public, but we, as a staff, are accustomed to look upon and speak of telephone facilities as a *service*, and as a service only; and if any of us were asked if we regarded ourselves as members of a manufacturing concern, we should, without stopping to think, unhesitatingly answer "no." If we stopped to think, we might answer differently, or at all events, less glibly. Individually, this answer would be absolutely correct; for, speaking generally, few of us, if any, during our telephone careers can claim to have fashioned,

\* Paper read to the Brighton Telephone Society, Feb. 27, 1911.

telephonically, a complete, saleable and commercial article. But, collectively, the answer would be wrong. All this creation and interweaving of departments, all our technical and commercial training, all this enormous expenditure of brain and money finds its culmination in a manufactured article—viz., that simple, saleable commercial commodity, the telephone call. Poles, wires, cables and switchboards (a point, by the way, for tariff reformers) are merely our raw material, and "service" is only the generic term for the multiplication of messages which the raw material makes possible. So that, although no individual, and no particular branch of the staff is wholly responsible for the complete article and can only therefore be recompensed for his services by the time he gives to his work, the concern as a whole is entitled to demand payment by results, that is, for each article which its staff, as a whole, produces.

And yet, after all "payment by time" is not, strictly, an accurate description of the position as regards our staff. It is a highly convenient system and assures continuity of work and service both to employer and employed, and it carries with it many advantages to the latter, among which is the certainty of that blessed institution a regular pay day. What we are really paid for is our output of work, which in a particular week may be worth less than the payment and in another week more. But in the end a clerk, for example, has kept so many books or rendered so many accounts for which he has received, by instalments, so many thousand pounds; and in speaking of thousands I am not exaggerating.

Has it ever occurred to any of you to take stock of the time you give to the Company and what you get for it. If not the following few statistics may be interesting, if not a little astonishing.

I will suppose the case of a clerk who lives out the full span of three score years and ten. Allowing for seventeen leap years these 70 years represent 25,567 days, or 613,608 hours, or 36,816,480 minutes. Imagine further he begins to earn a living at the age of seventeen and retires on a pension of two-thirds of his final salary at the age of 60. This means 44 years' work and I assume he works eight hours on five days of the week and four hours on one day. We must leave out of account Sundays and holidays which total to 70 days in the year, allowing twelve working days annual leave and six days public holidays. Therefore from the 365 days in the year I deduct 70 and also 25 for half Saturdays, leaving 270 working days of eight hours each, or 2,160 hours in all, or 129,600 minutes. I throw the luncheon hour in. In 44 years the clerk has devoted 5,702,400 minutes to his employer out of the 23,141,787 minutes of his life during that period, or out of the 36,816,480 minutes which make up his whole life. Put in another way, he spends 15.5 per cent. of his life in earning his living and only 24.6 per cent. of his working life is given to his employer.

So much for his time; now for his pay. For facility of calculation I will deal only with round figures and assume that he commences with a salary of £30 a year and rises at an even rate of £10 a year, till he reaches £350 a year, at which he stops. In 44 years he will have pocketed £10,120, or an average of £230 a year, or 43d. (nearly one half-penny) for every minute of his working time. If we add the pension of two-thirds of £350, which amounts to £2,333 in ten years, his total receipts reach £12,453, or 53d. for every working minute of his life.

Without, perhaps, representing an actual case, these figures may, I think, be claimed to be fairly typical, and to those of us who are inclined to be thriftless of our time and money, they may perhaps provide food for reflection in regard to our business and private responsibilities.

Employment is such a general thing that the seriousness and importance of the compact between employer and employed is not infrequently lost sight of; and a curious feature of the mutual understanding between the two is that although this compact is of greater personal importance to the employee than to the employer—due partly to the fact that there is better fish in the sea than was ever got out of it—it is usually the employee who fails to strictly observe his part of it. By way of simple illustration I need only suggest that a man who has a weakness for habitual unpunctuality would be astonished, not to say aggrieved, if his employer showed a similar failing at pay day. The chief reason, no doubt, being

that the immediate result of such a lapse would be more pronounced and more quickly felt than in a question of time alone; or in other words, superficially, money seems more important than time. A doubtful proposition, because time in this case being the cause of money, it follows that the effect is superior to the cause; which needs some proving.

The whole is greater than the part, and it is this law which goes far to explain why the receipt of wages possesses a higher value than the payment of them. Because although the amount represents to the employer so much work for so much time, it represents to the recipient the means by which he wholly lives, year in and year out.

In my view, whether a man is master of his own time in the sense that he has made no bargain with an employer, or whether he is in the paid service of another, the particular time set apart for work involving recompense or recognition of any kind is not his own. If he be a writer, or an artist, or an actor, and puts not forth what he knows to be his best during those working hours, he is defrauding someone; for he is expecting payment or recognition for what he knows to be inferior to what it pretends to be. That he is foolish and improvident is accidental, but at the same time true, the experience of centuries being that it is only the best work that ultimately prevails. But, for all that, the man who in the ordinary acceptance of the phrase is "his own master" and lives by results, *i.e.*, by piecework, has only two responsibilities—viz., the responsibility to himself and that to those whom his work is intended to benefit or interest. We, as employees, and all who are similarly circumstanced, have a third responsibility, that which we owe to our immediate masters as our share of the compact; while, on the other hand, our masters have a like burden. They are directly responsible for the business as a whole as it is presented to the public; they have their own part of the bargain with the staff to observe, and they have their own individual responsibilities.

The contract, definite or implied, between the Company and ourselves, is a simple one: time to be fully occupied on the one side and payment therefor on the other; measure for measure. But it is an extremely rare thing to find the benefits of a bargain exactly equal on both sides; and it is not too much to say that with employer and employed the effect of the bargain is entirely in the hands of the latter. Not to speak of ourselves disrespectfully, the Company buys a pig in a poke every time it adds to its staff. How each novice will turn out may be known to himself but is certainly unknown to the management. All the management does know for certain is that for so much time it will part with so much money, but what that time will bring forth is in the lap of the gods. To balance the scales exactly, every grain of sand that falls through the hour glass should carry its quantum of work. The work may be mediocre, but if it is the best the worker can produce, the worst that can be said of it is that the evil star of the Company was in the ascendant when it secured his services.

Every minute of time that has to be accounted for has to be paid for; every minute of time occupied produces something; and every minute wasted means a loss of something to somebody.

*(To be continued.)*

#### THE GENTLE WAY.

GENTLENESS has in recent years become a business virtue. It has proved far superior to roughness and bullying. With very few exceptions, the men who are now at the top of the great corporations are men of quiet manner and courteous speech. It is a good thing for a man to have a roar in his lungs in case it may sometimes be needed. It is necessary for him to be strong willed and resolute at all times, but no matter how strong he is, or how resolute, it is always wise to try the gentle way first. In the early days of commercialism men undervalued gentleness. They undervalued steam until Watt and Stephenson showed what steam could do. They undervalued electricity until Morse and Bell proved what could be done with the tiniest of electric currents. They undervalued air until the Wright Brothers began to fly with aeroplanes, and in the same way they undervalued kindness and courtesy, until they saw in every line of industry the gentle-mannered men moving to the top.

SLOWLY and after many mistakes, we are learning that the way to build up any business is to make friends for it. We are outgrowing that juvenile idea that business is a game of fight, and we are being taught that the best asset any business can have is the good will of the general public.

## IRON IN ITS RELATION TO ELECTRICAL ENGINEERING.

BY THOS. PETTIGREW, *Glasgow.*

(Concluded from page 253.)

ALL brands of wrought iron are not equally good. Perhaps the best is known as Swedish black charcoal iron, which is widely used in electrical apparatus.

Iron suffers in machining, and a good piece of iron will show a lower magnetic quality after machining than it did before. Fortunately these bad effects can be eliminated by careful annealing, and after annealing the iron will be found to be as good as ever it was. Annealing consists in heating the iron to a red heat, carefully baking it at an even temperature and allowing it gradually to cool. The cores of relays and suchlike apparatus should always be annealed after machining, as otherwise trouble through residual magnetism, with its consequent sticking faults, is sure to result.

The magnetic quality of iron depends to a very great extent upon its chemical composition, and the presence of a low percentage of impurities has a very detrimental effect upon the quality. Conversely, if certain additions be made to iron, its magnetic qualities are improved. Thus as far back as 1838 a Mr. Caldwell discovered that if from 2 per cent. to 4 per cent. of silicon were added to cast iron, an all-round improvement in its magnetic qualities resulted. Since then further research has shown that if certain percentages of tungsten, nickel and manganese be added to steel, its quality for permanent magnet work is considerably improved; so much so that these steels are universally employed for receiver magnets, etc. Further, if some 12 per cent. of manganese be added to steel it renders the metal, to all practical intents, non-magnetic.

A few years ago Mr. Hadfield, of Sheffield, with some co-experimenters, established a research to investigate in this direction, and about 120 samples were made up, each of a different composition. The test rods were subjected to exhaustive tests, first before annealing and again after annealing.

One specimen showed remarkable characteristics, and a repeat experiment proved that it was no chance result. The metal was a mixture of silicon, aluminium and iron, and is to-day sold under the name of "stalloy."

Very exhaustive tests have proved beyond doubt that it is vastly superior to the best hitherto known irons, and it is not too much to say that the electrical manufacturer who would retain his position in the forefront of the industry simply *cannot afford* to continue to use the older irons. Particularly is this so in alternating or varying current apparatus, and we may be certain that the Company will not be behindhand in calling the latest advance of science to its aid.

A B H curve for stalloy was given in one of the Company's "B" Correspondence Course papers last session, and should be studied by everyone who is at all interested in the subject.

Have we reached finality in this direction? He would be a very bold or foolish man who would say "Yes," as we may be certain that many are patiently striving for even better results.

One great problem remains unsolved. No magnetic insulator is known. We can, and do, shield our apparatus to prevent interference from external magnetic fields, but we do this by providing a low resistance path for the stray lines of force, or in other words, we use an iron cover. The man who discovers a material, metallic or otherwise, which will not allow magnetic lines of force to pass through it, will revolutionise the electrical industry.

*Effects of Temperature on the Magnetic Properties of Iron.*—If a thick sheet of iron be made white-hot and allowed to cool in a dark room, a very remarkable effect may be easily observed. As the iron gradually cools, its colouring passes from white through orange to red, but at a certain moment the cooling iron suddenly brightens up again, then gradually cools to blackness. The point of the re-brightening is known as the "temperature of recalcence." The theory is that at this particular moment, owing to some molecular change or reconstruction, there is a sudden release of energy, resulting in the re-heating of the mass. Perhaps some of the thinkers who go deeply into the structure of matter may be able to

advance some theory in explanation of the phenomenon. So far as I know no satisfactory explanation has ever been offered.

However, one fact—one very significant fact—we do know, viz., that above the point of recalcence temperature, iron is no longer magnetic, or very feebly so, and that in cooling it is at the moment of re-brightening that it regains its magnetic properties. Different kinds of iron show different temperatures of recalcence.

With magnetic fields of ordinary strengths a rise in temperature results in a falling away in the magnetic properties of the iron. I speak now of temperature rises of hundreds of degrees Cent.

At very low magnetising values however, this order of things no longer holds good, as will be seen from the two remarkable curves in Fig. 3. These curves are due to Dr. D. K. Morris who carried out a very exhaustive research on this subject.

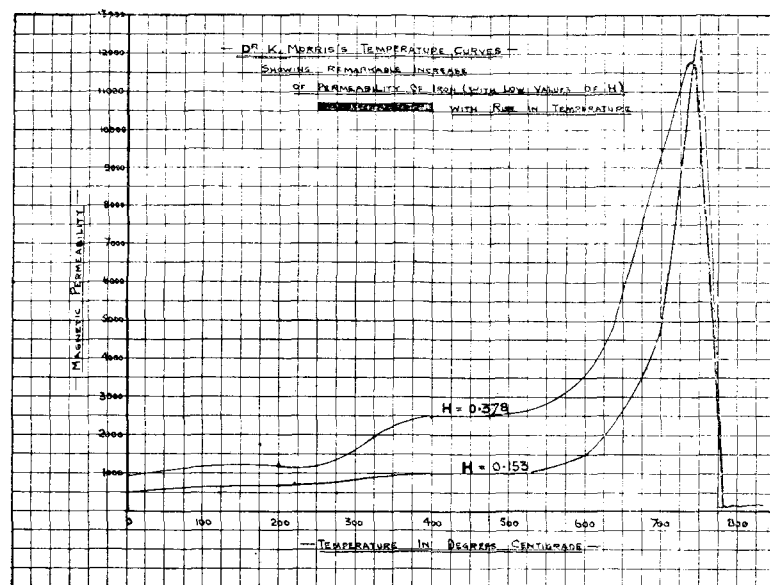


FIG. 3.

It will be seen that between 600° and 750° C. the iron becomes remarkably sensitive to weak magnetising forces, and magnetisation results are shown which at ordinary temperatures would require the application of a much stronger magnetising force.

The condition of the iron, however, is very unstable and a small percentage variation in the temperature, up or down, brings about a disastrous falling away in the degree of magnetisation. Very considerable difficulty lies in the way of taking practical advantage of this peculiar property in iron. The high temperature, the constancy of temperature required, insulation troubles, etc., all militate against its practical application.

This remarkable effect seems to be due to the molecules of the iron being in a very sensitive condition, probably the result of the expansion of the mass, and if the iron could be fixed in this condition at ordinary temperatures, it would find extensive application in iron-controlled sensitive instruments of all kinds.

Nothing seems more likely to bring about such a result, than the addition of some material which will act as a kind of molecular lubricator.

*Practical Application.*—The practical application of the principles we have roughly outlined is well exemplified in the modern telephone exchange. The thousands of relays, register meters, etc., are simply special forms of electro-magnets, each proportioned and designed as regards size and winding according to its particular function. Steady currents are employed in relay circuits as a rule, hence the cores, yokes and armatures are forged from wrought iron.

Repeaters, transformers, induction coils, etc., carry speech currents, and are therefore provided with cores of annealed iron wire of high magnetic quality.

*The Receiver.*—Perhaps the most remarkable piece of apparatus in the telephone circuit is the receiver. Here, by the action and reaction of two magnetic fields upon each other and upon a disc of iron, speech currents are converted into sound waves.

Considering that Bell's invention made telephony possible, and that it was designed and constructed at a time when little or nothing was known of the laws of electro-magnetics the conception of such an idea would appear to have been a heaven-born inspiration. It is a remarkable fact that even at the present day Bell's instrument is still the standard. It has been improved in detail, but the principle remains, and this, notwithstanding many ingenious but futile attempts to produce something better; speech currents as received from the telephone line are so microscopic in value that, acting through coils directly on a diaphragm, little or no effect would be produced.

Small as these currents are, they are quite powerful enough to vary the strength of an existing magnetic field, and it was this that led to Bell's success.

The action of the line currents will be best understood by reference to a B H curve. Between magnetisation values of from, say, 4,000 to 7,000 lines per sq. cm. the B H curve is practically perpendicular, indicating that between these limits, small changes in the magnetising force produce very marked variations in the field strength. This is the fundamental principle of the telephone receiver.

A permanent magnet designed to give a field in the region of the perpendicular of the B H curve (refer to Fig. 1) is provided with soft iron pole pieces carrying coils for the reception of the line currents. In front, but clear of the pole pieces, is fixed the thin iron diaphragm.

The varying line currents produce corresponding changes in the field strength, and the diaphragm is subjected to varying pulls. It is consequently given a vibratory movement corresponding exactly to the speech current interferences, and, by setting the air in front of the diaphragm in motion, speech is reproduced.

An important compound effect enters into the problem, due to the fact that the pull of a magnet varies as the square of the density, and this has a multiplying effect on the movements of the diaphragm, but time does not permit of my doing more than mentioning the fact.

*Recent Developments.*—We shall now turn to recent developments and discoveries in connection with iron and steel, and while there is much to say on this part of the subject, I must confine myself to a few interesting examples.

*Telephonograph.*—Poulsen, a Dane, discovered that if a steel wire were made to travel close to, but not touching, the pole pieces of an electro-magnet, to which was connected an ordinary telephone transmitter circuit, sounds spoken into the transmitter were magnetically recorded in the mass of the wire, and could be reproduced by substituting a receiver for the transmitter, and again causing the wire to travel in front of the magnet.

This is a most remarkable phenomenon.

Mr. Cohen, a year or two ago, showed us by means of the oscillograph what a very complex series of currents were required for the transmission of a single simple word, and yet, by this ridiculously simple apparatus, a magnetic picture of these complex currents can be accurately recorded on a hard steel wire, and, moreover, can be reproduced, not once or twice, but practically as often as one may wish.

Consider what this means. The molecules in the mass of the wire have, by the action of these very weak and rapidly varying magnetising forces, been rearranged and fixed in such beautifully accurate magnetic order that, acting inductively on the electro-magnet, a perfect facsimile of the recorded current waves is reproduced, which, passing through the receiver, is heard as speech. Using this steel wire apparatus, if an exhaustive research with the aid of a very sensitive oscillograph were made, one might obtain photographs of the current waves of a large number of words, and from the shapes of the waves a code of word signals might be evolved. It would, doubtless, be found that each word had its own characteristic shape, and it is not beyond the bounds of possibility that by a careful analysis of the records an alphabet, or its equivalent, could be constructed which would enable the now meaningless waves which a sentence spoken into the oscillograph would show to be deciphered and read off.

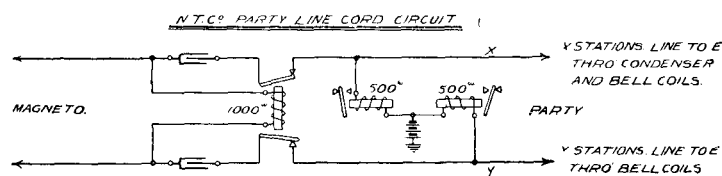
Given that such a result is possible, it would mean a great advance in telegraphy. For instance, it is quite conceivable that the number of signals to be transmitted for a given word might be

reduced to one per syllable; whereas under present conditions as many as five currents per character are required. If, further, it were found that the shapes of the various syllable signals were not too intricate, or were so outstandingly characteristic in appearance as not to be readily mistaken one for another, it might be that the code would be of great value for submarine cable work. The capacity on long cables has a very serious effect on wave signals, but if the smoothing-out effect were not too great, then the revenue per cable might be increased some 100 per cent. to 300 per cent.

No doubt you will conclude that my imagination has run riot; nevertheless, one must admit that, allowing for certain assumptions, I have but carried a certain line of thought to its logical conclusion. Possibilities in this direction there undoubtedly are, yet one cannot foresee just how far they may be practical, but it would not be altogether wise to say that such a development is impossible.

This is a digression however; let us return to the telephonograph.

Poulsen designed an instrument to be used in conjunction with the telephone, to which he gave the name of the "telephonograph." This instrument was intended to record private messages over the exchange line should the required party not be at hand. The telephone line would simply be switched through to the telephonograph, the message spoken over the line in the usual way, and the record would then be ready to reproduce its message directly into



C.B. (STONE SYSTEM) CORD CIRCUIT  
P.O. CORD CIRCUIT (WATERLOO EXCH.)

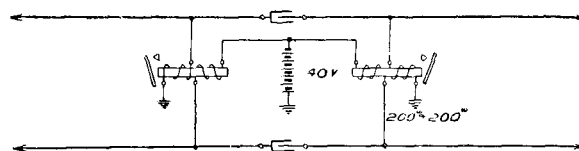


FIG. 4.

the ear of the interested party. Recorded messages can be filed away for future reference, or effectually wiped out of existence by causing the wire to travel in front of a permanent magnet provided for that purpose.

It is interesting to note that the timbre or quality of the reproduced speech is very much better than is the case with mechanical instruments of a similar kind.

*Speech Reproduced in Iron by Molecular Vibration.*—One of the early discoveries in electro-magnetics was that at the moment of switching on the current an electro-magnet emitted a peculiar sound, which became known as the "magnetic tick." The sound is more of a dull thud than a sharp note, and is very suggestive of a kind of molecular shudder which passes through the iron.

It has also been known for years that with the diaphragm removed, provided one listened very intently, speech could be heard in a receiver. I would not go the length of saying that this effect could be observed with every receiver, but that it can be observed with some is an indisputable fact.

Again, soon after the introduction of omnibus line working in Glasgow the electricians and others of the staff were sometimes rather startled to hear a conversation reproduced by the relays. This effect has all along the line been associated with the 1,000-ohms double make-and-break Ericsson relay as fitted in the party line cord circuit, but when I came to analyse this speaking effect I found considerable difficulty in offering any feasible explanation. Indeed, I came to the conclusion that the relay ought *not* to speak.

SPEECH REPRODUCTION EXPERIMENTS.

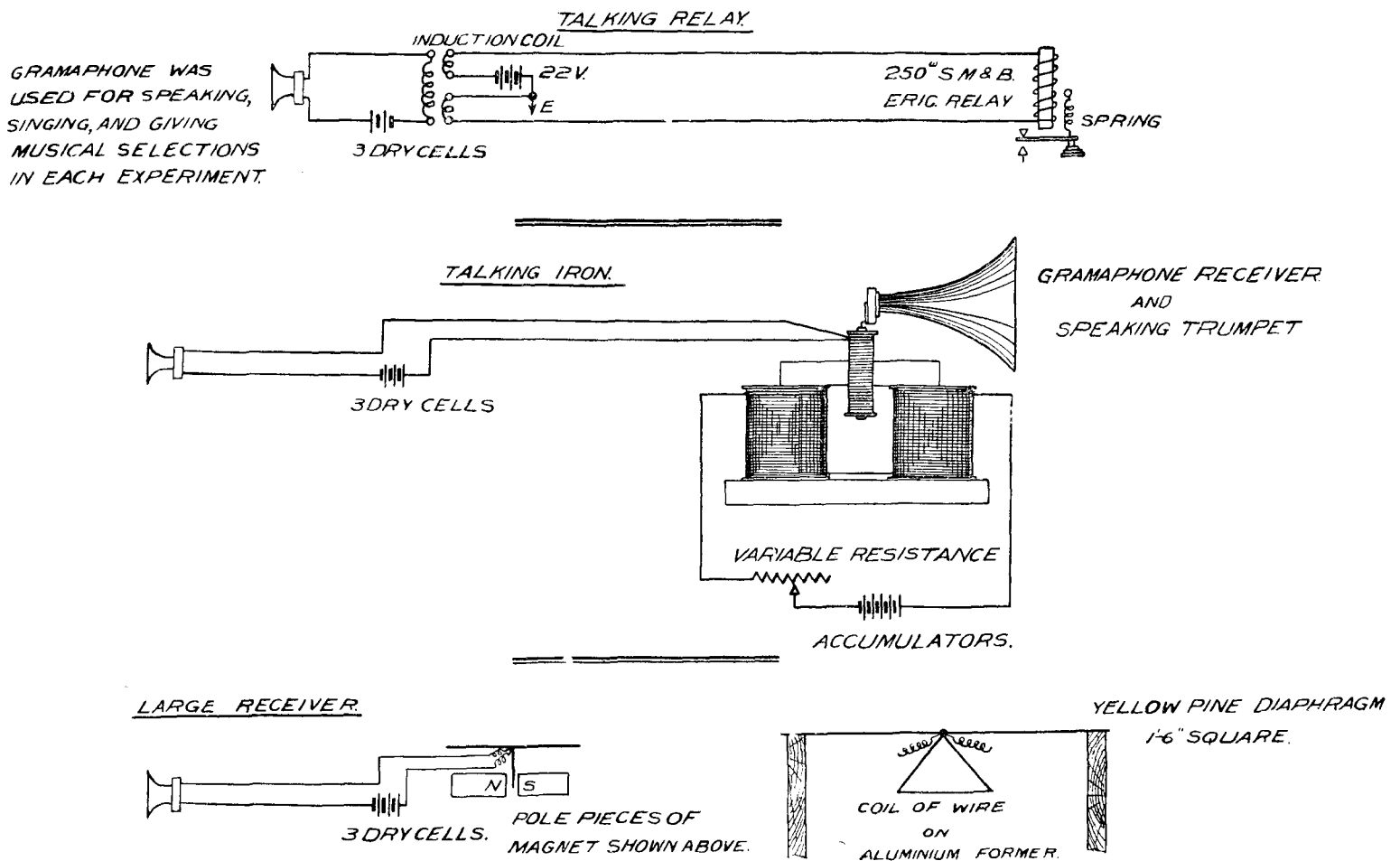


FIG. 5.

The matter seemed to call for further investigation, and accordingly an experimental circuit was set up, and, with the assistance of Mr. A. Browne, a thorough investigation was made. We proved to our complete satisfaction that the 1,000-ohms relay plays little or no part in the effect referred to, and that the speech reproduction is entirely due to the receiver action of the two 500-ohms party line relays. It is interesting to note, however, that with a howler connected to a party line circuit the sound can be heard not only in the three relays, but also in the condensers.

Before leaving this circuit I would draw your attention to a somewhat remarkable feature in it. Compare the party line circuit in Fig. 4 with the cord circuit of the new system as now being installed in the new Post Office Exchange in Waterloo Street.

One can see at a glance that our party cord circuit is actually a combination of local battery and Stone central battery systems. Does this account for the excellent transmission on the party line circuits? From experimental results made in a very rough way I am of the opinion that the battery current on the line and the effect of the condensers thereon play a very important part in raising the transmission efficiencies on these lines. One is tempted to go further into this matter, but time does not permit.

I would strongly urge the Head Office Scientific Department to make a thorough investigation of the problem, as there is no saying how much value the obtained results might be in future transmission problems.

We now come to the study of speech reproduction by molecular vibrations.

It is very curious that, notwithstanding the many indications which telephone engineers have had that molecular vibration in iron could produce speech, the matter was left for a German professor to investigate. The research proved very successful, as beginning with special apparatus the professor was led to try large masses of iron, and in each and all cases he found that the iron could be heard speaking. His last experiment was made on a dynamo. The armature was disconnected from the field magnet, leaving the two free to be coupled up to different circuits. The field was excited from a set of storage cells. An ordinary telephone transmitter was connected across the armature connections, and it was found that if the ear were placed on the field magnet yoke, words, singing, laughing, etc., spoken into the transmitter were all distinctly reproduced in the mass of iron.

The professor published a paper on his discoveries, a translation of which appeared in one of the numbers of the *Post Office Engineers Journal*. In that article the bare facts are recorded, and there is little to assist one in reproducing the experiments. I have experimented on dynamos, motors, induction coils, repeaters, relays, etc., and have succeeded in getting the effect in every one of them. The difficulty was, however, to obtain results, which could be heard all over a large room. I struck the idea of using a gramophone receiver and speaking trumpet to pick up the mechanical vibrations in the iron and reproduce them as speech, and experiment showed that this added to the results obtained. After experimenting with every conceivable kind of coil, etc., very good effects were obtained latterly with the coil and core of a pilot relay as shown in Fig. 5.

And now a word in explanation of this phenomenon. A very strong magnetic field is required, so that we may look upon the lines of force as being comparable to violin strings. The molecules in the iron mass are all perfectly lined up to lie along the lines of force. The transmitter currents deflect the main field to a varying degree, first in one direction and then in another, and the molecules in the mass follow these movements, set the whole mass of the iron in vibration, and speech is reproduced. The transmitter currents may therefore be said to pluck the taut violin strings, set them in vibration, these in turn setting the molecules in motion, so producing speech in the mass.

As a last experiment I attempted the reproduction of speech by a giant telephone receiver, which, as far as I know, is quite original in design. The idea occurred to me while puzzling out another piece of apparatus in connection with our experiments. A rough model was made up, and we obtained startlingly good results right away. A coil of wire is attached to the centre of a thin pine diaphragm and is free to move vertically between the pole pieces of a powerful electro-magnet. The transmitter currents are passed through this coil direct, and a vertical motion is produced, upward or downward, according to the direction of the current.

The arrangement is therefore surprisingly simple; indeed, I made up a receiver in which a coil was fixed to the bottom of a cigar box, and splendid results were obtained.

And now I have finished. We have not by a very long way exhausted the subject we set out to discuss, but if I have succeeded in convincing you that iron is the most wonderful metal known to man, my task has not been in vain. If on the other hand you are in doubt as to the truth of this remark, put it down to the weakness of the writer, but believe in the iron.

In conclusion, I beg to acknowledge the wholehearted and enthusiastic assistance I have had in my experimental work from Messrs. Rafferty and Forrester. They have been ready to assist me late and early, often at serious inconvenience to themselves; and in a very great measure I have them to thank for some of the interesting experiments I have been able to make.

## A GRIEVANCE.

By PERCY CHESTER.

Now my grievance is this. Why should I, as a telephone subscriber on the message rate system, be obliged to pay an unduly high rate of subscription so as to enable a large number of flat rate subscribers to have their telephones at unduly low rates?

Firms and individuals in business are often very proud of announcing that they spend, say, £500 a year on telegrams and £100 a year on postage stamps, and such amounts are paid quite cheerfully and with the feeling that value has been received.

Now supposing the Post Office were to suggest allowing firms or individuals to send as many telegrams as they liked for a lump sum of £50 a year, or letters for £10 a year, and, to equalise matters, to make ordinary people, like myself, pay 2d. for every letter and 1s. for each telegram, I have no hesitation in saying that the individual responsible for making such a suggestion would be regarded as a madman.

As a matter of fact this is exactly what is taking place as regards the telephone. A flat rate subscriber is often getting £40, £50, or even more value a year out of his £17 telephone and to make up for this I, with many thousands of other people, have to pay an excessive rate for my telephone as a message rate subscriber.

This is not logic or common sense, and it behoves message rate subscribers, as a body, to see that this unsatisfactory state of affairs be altered as soon as possible.

Before, however, dealing with this point, I should like to give a condensed report of an interview that might have recently taken place between the Postmaster-General and a deputation from the London Stock Exchange on this momentous question, which, I believe, has not hitherto been published.

The report reads as follows:—

The Postmaster-General received the deputation from the Stock Exchange with the usual official courtesy, and having begged the members to be seated, he remarked that the gentlemen present would no doubt be aware that for a number of years they had had the good fortune to have their flat rate telephones at an absurdly cheap rate, much to the detriment of the message rate subscribers, who had consequently had to pay a much higher rate than they would otherwise have had to. (At this point an emaciated message rate broker ventured to say "Hear, hear." This gentleman had unfortunately seated himself between two overfed flat rate jobbers and a momentary disturbance occurred whilst his remains were carried out on a stretcher.)

The Postmaster-General then resumed his remarks by telling the deputation in impressive tones of what George Washington, who never told a lie, had said when he was approached by a canvasser (since deceased) to have a telephone on the flat rate system. "Young man," said he, buttoning his coat and looking the canvasser straight in the face, "are you not aware that one of the greatest privileges a man has in this world is to pay, like a man, for what he gets. Your offer contravenes this great principle, and I will have none of it. Begone!"

Again, addressing himself to the older men present, he asked if anything could be more injurious to the morals of a young broker or jobber just entering business life, with high and noble ideals, than being offered a telephone on terms which the great George Washington, who never told a lie, had so sternly and justly denounced. Would it not possibly be the first step downwards that only too often ends in selling short and drinking long.

\* \* \* \* \*

The silence that followed this speech was only, at last, broken by a nervous jobber dropping a cough lozenge. This brought the assemblage back again to mundane affairs, and each member of the deputation, buttoning his coat, left the room, apparently filled with the firm determination of leading better and purer telephonic lives in future.

This is, of course, helpful, but it is obvious that flat rate subscribers will fight tooth and nail against the abolition of a rate which is of immense pecuniary benefit to themselves, and in connection with this, I would like to convey a special word of warning, and that is, if any body of gentlemen meet publicly to discuss the telephone question, and the abolition of the flat rate does not occupy the most prominent place on the programme, message rate subscribers can take it from me that these individuals are not so innocent as they look.

I have not the slightest sympathy with any message rate subscriber who complains of the cost of his telephone, unless he is prepared to assist in every way possible in the abolition of the flat rate, and I have no hesitation in saying that the only hope for message rate subscribers is to join together in a body, and insist on being relieved of this unfair burden at present placed on them, and unless they do this they will probably have the privilege of paying for the benefit of flat rate subscribers until the crack of doom.

I should like to think that some prominent message rate subscribers will take this matter up, and I, for one, would be only too happy to subscribe to any organisation formed for the protection of message rate subscribers.

## NEWCASTLE-UPON-TYNE OPERATORS' THRIFT CLUB.

The annual meeting of this club was held in the operators' dining-room on Jan. 13. The secretary read the report on the past year's working, which proved to have been very successful.

The number of depositors is 72, which is an increase of ten on the previous year, the total amount of money received from depositors since the formation of the club being £425 19s. 6d.; amount paid to depositors in 1910, £245 19s. 6d.; leaving a balance in the bank of £180.

We think the above figures show the usefulness of the "thrift club," and several members expressed their appreciation of its work. A vote of thanks was passed to the honorary officials for services rendered.



## TELEPHONE WOMEN.

## LXXXVIII.—CELIA KATE HOOPER.

The present Clerk-in-Charge of the North Exchange (London) was born at Stoke Newington, and educated at the Skinner Company's Girls School, Stamford Hill. She entered the service in 1897 as an Operator at Holborn, subsequently being appointed



CELIA KATE HOOPER.

Clerk at that exchange. In July, 1904, she was promoted to be Supervisor at London Wall, and, four years later, to be Senior Supervisor-in-Charge at Hammersmith being further promoted to the position of Clerk-in-Charge at Brixton in July last.

Miss Hooper's keen interest in her work has led her to seek wider knowledge outside the immediate sphere of her labours. In 1904 she obtained 74 per cent. marks in the Mathematical Course of the Company's Correspondence Classes, and last winter she attended the classes of the Regent Street Polytechnic, receiving a second-class certificate in connection with the City and Guilds examination in telephony. She acted very successfully as honorary secretary for the traffic branch of the London Telephone Society last session, and has this year been appointed honorary secretary and treasurer of the newly formed London Operators' Telephone Society. This society has a membership of 540, and she must find in her arduous duties plenty of scope for her natural enthusiasm and ability. In the February of this year Miss Hooper was transferred to the position of Clerk-in-Charge, North.

Miss Hooper fully appreciates and upholds the responsibilities of her position, but retains those attributes of disposition and manner which must always make for popularity and gain her firm friends.

## LXXXIX.—CONSTANCE MARION GREGORY.

WHEN Miss Gregory entered the service in May, 1895, she reported for duty at Coleman Street, and, like all operators prior to August, 1899, was largely dependent on the good nature of those colleagues sitting on either side of her at the switchboard for her tuition. Her first duty was to learn the numbers of the different exchanges in London. In those days, instead of commencing with the unit for each exchange, Coleman Street subscribers were numbered from 1 to 500; Leadenhall (afterwards cut in with others to Avenue), 501 to 1,000; Cornhill, 1,001 to 1,500; Queen Victoria Street (now Bank), 1,501 to 2,000; and so on. Subscribers, in asking for numbers, did not give in the name of the exchange, and the operators were therefore obliged to be perfectly acquainted with the divisions.

Shortly after Miss Gregory joined the Company the re-numbering of the exchanges and the necessary mention of name by subscribers was adopted at Mr. Clay's suggestion.

Miss Gregory's first promotion was as Supervisor to London Wall on Feb. 13, 1903, and she became senior Supervisor-in-Charge of Streatham on Nov. 29, 1907, this exchange then being of the magneto type, and situated in small and very old premises. It was



CONSTANCE MARION GREGORY.

transferred to the central battery system in the present excellent new building in January, 1910, Miss Gregory being promoted to Clerk-in-Charge in April of the same year.

She has throughout her service been a quiet, conscientious worker, and has justified her selection for the position she now holds. She states that her chief recreation is walking, but confesses to a weakness for football—we may say watching the game, not playing it.

## IMPUDENCE AND ASSUMPTION.

MRS. COBB: Was the grocer's boy impudent to you again when you telephoned your order this morning?—Cook: Yes, Mrs. Cobb, he was that; but I fixed him this time. I sez, "Who the — do you think you're talking to. This is Mrs. Cobb."—*Berkshire Chronicle*.

## THE MEASURED RATES.

By THOS. BELL, *Electrical Department, Glasgow.*

WHEREVER the measured rate system has been adopted it has been amply justified by the increased efficiency and improved service which have been obtained by its use.

It is a remedy for the ineffective calls which compose 25 per cent. of the total calls made under flat rates, as it prevents loading of the lines with unnecessary traffic and leaves them free for urgent business.

It also ensures the best service for the subscriber, as each ineffective call under measured rates is a loss to the Company. It allows scope for the expansion of the telephone service, while promoting at the same time an efficient and reliable service. As the telephone system develops under the measured rates, the cost of construction for increased number of lines will be, to some extent, balanced by the increased revenue which results from the extension of the service. Also, the maintenance charges will tend to decrease as the number of calls per subscriber per day fall to the measured rate standard which is only 75 per cent. of that under flat rates.

When we wish to fix a suitable rate with flat rate charges under given conditions, two ways are open to us.

We may anticipate a large development and fix the rate accordingly fairly high. This, however, will discourage the small user, as this method simply means penalising the small user in order to make up for the extra cost of the service rendered to the large user.

On the other hand, if we fix the rate according to present conditions of development, the result will probably be that in a few years it will be quite inadequate to meet the costs of the service.

A short consideration of the factors governing the cost of producing the telephone message, or unit of telephone service, will make this clearer.

In the first place, there is the capital cost, consisting of the sum spent in installing the subscriber's line, instrument, and the necessary exchange plant and apparatus. A rough estimate places this sum at an average of £35 per subscriber.

The next item is the cost of handling the call consisting of operating expenses, recording, etc. There is also the cost of maintenance which may be taken as a certain percentage of the capital cost of construction.

When extensions takes place in the exchange equipment the increase of capital cost on several items of exchange apparatus such as subscribers' relays, answering jacks, calling lamps, operators' positions and equipments of cords and keys, is simply proportional to the increase in the number of subscribers' lines.

The cost of extending the multiple switchboard, however, increases very much more rapidly, being proportional to the square of the number of additional lines accommodated on the switchboard.

That is to say, it is found that if we double the number of lines contained on the switchboard the cost of the multiple jacks will be not double but four times that of the original cost.

For example, taking an exchange of moderate size and assuming that each operator can handle 100 lines, and taking the capacity of the switchboard at 6,000 lines, the number of operators'

positions required would be  $\frac{6000}{100}$  *i.e.*, 60 positions. As there are three operators' positions per section;  $\frac{60}{3}$  *i.e.*, twenty switchboard

sections are required. Each section would have 6,000 multiple jacks, and the total for the whole switchboard would be  $20 \times 6,000 = 120,000$  multiple jacks.

As showing how the cost of construction increases we may consider the capacity of the switchboard doubled; giving 12,000

lines. Here the number of operators' positions would be  $\frac{12,000}{100}$

$= 120$  and the number of switchboard sections  $\frac{120}{3} = 40$ .

The number of multiple jacks required would be  $40 \times 12,000 = 480,000$ ; nearly half a million jacks.

That is to say while the number of positions has been doubled, the number of multiple jacks has been increased four times, and the cost of construction and maintenance is proportionately increased.

There is also to be considered the greatly increased number of soldered connections made on the multiple jacks, and the cost of the additional switchboard cable required.

There is also the cost of the junction lines which must be provided to take the extra traffic from the additional unlimited subscribers. Under flat rates the number of junctions required for a given increase of lines is often excessive.

For instance, in one centre where an increase of 25 per cent. of stations had taken place the increase of junctions that had to be made was 100 per cent. Of the calls passing over these lines it is estimated that 25 per cent. are unnecessary.

By adopting measured rates the number of junctions necessary for a given number of subscribers can be reduced as the number of calls to be dealt with falls to the measured rate standard, while the cost of providing additional junctions will be met by the revenue.

Further, as the capacity of the switchboard increases, the number of calls per subscriber also tend to increase in a certain proportion, as many of the existing subscribers are likely to require connection with a certain number of the new subscribers. So that with extension of the service there is a steadily increasing number of calls per day, and a greatly increased expenditure upon construction and maintenance, which yields no further revenue so far as the existing flat rate subscribers are concerned. Obviously this tends to hinder the development of the telephone system.

Similarly, a company has not the same inducement under flat rates to push the sale of auxiliary apparatus tending to increase the use of the telephone, as such increased use would provide no adequate revenue.

With measured rate subscribers, on the other hand, as the telephone system is extended, increased facilities of service cause an increased number of remunerative calls.

The increased cost of construction and higher maintenance charges are balanced by the increased revenue from the measured rate subscribers, who are using the extended service. Thus, by the adoption of the measured rates, the obstacles existing under the flat rate system vanish and give the service full scope for development.

## OPERATING BY THE SENSE OF TOUCH.

By H. SADLER, *London.*

THERE is installed at one of the subscribers in this district a 50-line common battery switchboard which is operated by a man who is practically blind and depends on the two senses of touch and hearing for the purposes of operating.

I have recently had an opportunity of watching his methods whilst at work, and the following gives an idea of how a connection is made and afterwards disconnected.

When an exchange line indicator is energised he feels, with his left hand, along the row until he comes to the desired one, at the same time selecting, with his right hand, an answering plug and throws the corresponding listening key; then he feels along the strip of exchange line jacks and inserts the plug, held in readiness, into the jack corresponding to the indicator.

He then accepts the extension number asked for, picks up the corresponding calling cord, feels along the strips of extension jacks until he locates the desired jack, when he inserts the plug and rings. When the connection is through he places the listening key in normal position and waits until he hears the slight click of the supervisory signal falling to its normal position, when he clears. One would surmise that it would be nearly impossible for him to tell which signal fell when two or more connections are on, but he made no mistake during the time I was watching him at work. To prevent any mistake occurring he challenges the line before clearing. Of course, the operation takes longer than if dealt with by an operator in possession of full faculties, but the precision with which the blind operator is able to locate the different pieces of apparatus on the switchboard is remarkable.

## BOLTON OPERATORS AND POOR CHILDREN.

EACH year as Christmas approaches the Bolton telephone operators work enthusiastically for many evenings making warm and useful clothing in great variety for the poor and crippled children connected with the Bolton Queen Street Unsectarian Mission.

Not content with this piece of good work, which brought brightness and warmth into many cheerless homes in Bolton at the opening of the new year, the operators made or dressed a handsome lot of dolls and got together a most creditable collection of useful toys for the needy children who are reached by the Mission.



BOLTON OPERATORS' DOLL SHOW.

The mere monetary value of the operators' benevolent contribution this year was nearly £20.

The Mission sent out postcards to the large number of needy children known to their workers, telling them that on bringing the card they would receive a toy, "the gift of the staff of the Bolton Telephone Exchange."

The exhibition of clothing and dolls was visited by the mayor and mayoress of Bolton, the town clerk and many other influential citizens, who were surprised at the taste and extent of the good work done by the operators in their own time after the conclusion of their arduous daily duties.

Mrs. and Miss Haley, the wife and daughter of the Bolton District Manager, enthusiastically joined with the operators in the benevolent work in every way possible, and the male staff provided funds by a football match, and deeply grateful as the poor recipients were, it is doubtful whether the whole work was not equally enjoyed by the operators.

## GOOD OPERATING.

- GOOD operating by employees gains the goodwill of the subscribers.
- ON every occasion answer promptly.
- ONly to your duty be inquisitive.
- OBey your instructions with cheerfulness.
- OWn a pleasant voice.
- DON't delay answering a signal.
- DEPending on another operator to answer.
- ONly when off duty let your thoughts occupy your mind with subjects foreign to your work.
- PACify angered subscribers by a pleasant "Number please."
- ENDeavour to acquire accuracy and speed and earn recognition from your superiors.
- REason with yourself as to your work—then remember our policy "A desire to please."
- ACquire the habit of punctuality and apply it to all your work.
- TALK directly into your transmitter—hereby avoiding unnecessary repetition.
- IDentify yourself to your subscriber by courtesy.
- INviting courtesy from them.
- NOTE the inconvenience caused by your errors.
- NEVER fail to profit by them.
- GIVE to the Company the best that is in you.
- GOOD operating will surely result therefrom.—R. J. FERGUSON.

## THE VALLEY OF BHONG.

At the Metropolitan staff dinner on March 9 the following version of "Peace, Peace," by Mr. J. H. BIGLAND, was sung by him to the well-known air in Lionel Monckton's *Country Girl* with great success:—

1.

Now I'll sing you a song of the Valley of Bhong,  
A land where we'll soon be adjourning;  
We shall wake up one morn in that beautiful bourne  
From which there can be no returning.  
It's as well to explain that it's in Carter Lane  
That this heaven on earth is located,  
And that some people say its advantages may  
Be the least little bit over-rated.

Chorus.

Peace, Peace, beautiful peace,  
The Millenium's coming along!  
Can it really be true we'll have nothing to do  
When we get to the Valley of Bhong?  
Peace, peace, beautiful peace,  
I fear that impression is wrong,  
For you mustn't suppose it's all *couleur de rose*,  
In the beautiful Valley of Bhong.

2.

About two years ago Daylight Saving, you know,  
Was the subject of much agitation;  
And a Member arose and dared to propose  
To alter the time of the nation.  
But it came as a shock when we put on the clock,  
Though they certainly did give us warning,  
Well, it may be a boon in May or in June,  
But it's *not* on a cold winter morning.

Chorus.

Peace! Peace! O for some peace!  
The present arrangement is wrong;  
We shan't have to arrive at 8.35  
When we get to the Valley of Bhong!  
Peace! Peace! slumber in peace,  
The present arrangement is wrong!  
They don't think it right to economise light  
In the beautiful Valley of Bhong!

3.

Although no one will try to dispute or deny  
That our work should receive supervision,  
And it's right, I surmise, that we should dot our "I's"  
And cross all our "T's" with precision.  
But I happened to hear a distressed Engineer  
Complain of a practice that wearsies,  
"Every moment" he sighed "Is now occupied  
In answering Works Order Queries."

Chorus.

Peace, peace, soon there'll be peace  
This trouble won't last very long,  
For I happen to know that they've got no "S.O."  
In the beautiful Valley of Bhong.  
Peace, peace, then there'll be peace  
Though your estimate comes out all wrong  
If they do ask you why, well you needn't reply  
In the beautiful Valley of Bhong.

4.

I'm delighted to hear at the close of the year,  
When we get to the end of our tether,  
And the time comes to go to the great G.P.O.,  
We shall all be migrating together.  
But it does seem to me that the late P.M.G.,  
On one point has certainly blundered:  
For it passes belief that our popular Chief,  
From the rest of the staff must be sundered.

Chorus.

Peace, peace, O for some Peace,  
I'm sure that decision is wrong,  
We'll have something to say if we lose Mr. Clay,  
When we go to the Valley of Bhong.  
Peace, peace, O for some Peace,  
But if *he* isn't coming along,  
Still it's something to know we shall have Harvey Lowe,  
When we get to the Valley of Bhong.

## POST OFFICE INSTITUTION OF ELECTRICAL ENGINEERS.

THE following paper read before the above institution can now be obtained:—

"Pneumatic Despatch," by H. R. Kempe. Price 6d.

# The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

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

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APRIL, 1911.

[No. 61.]

## THE POSTMASTER-GENERAL AND THE MUNICIPAL DEPUTATION.

A LARGE and fairly representative deputation of municipal and other authorities was received by the Postmaster-General on Feb. 27. It was introduced by Mr. SCOTT DICKSON, M.P., and its principal spokesman seems to have been Mr. D. M. STEVENSON, of Glasgow telephone fame. It asked that the question whether there should be local administration of the telephone service should be the subject of a Parliamentary enquiry. Its principal concern was, of course, the reduction of rates and the working of the telephone at cost price.

Mr. HERBERT SAMUEL, after pointing out that there was no declared demand at the present time on the part of any municipality to undertake the telephone business, enunciated the fairly obvious truth that a Government Department was in a better position than a municipality both from a technical and financial point of view to conduct efficiently a public service like the telephone. He also stated that there was no intention of altering the present rates on the transfer of the business to the State, and promised that any revision of rates after the arbitration should, if desired, be the subject of an enquiry. To that extent only he acceded to the wishes of the deputation, and the municipal agitation may be said to have received its quietus once and for all.

In delivering these decisions to the deputation, Mr. SAMUEL gave them some useful instruction on telephone politics and economics. He pointed out that it was false policy to pay low fees if the result was a service slow, untrustworthy and troublesome. The first principle of telephone policy is efficiency. The second, the widest possible extension of its use. The third principle, he held, was that while the telephone service should not provide a large surplus for the relief of general taxation, telephone

subscribers ought not to expect to be subsidised by the Exchequer.

The flat rate, as the Postmaster-General truly said, was, of course, a great convenience to the telephone user who wanted to know precisely what he would be paying for his telephone, and it was undoubtedly a great economy for the larger user to get his service below cost price—as many of them did now. In all these services the cost was in relation to use, and the whole weight of telephone experience in England and America was against the principle of a flat rate with an unlimited service. What the amount of a measured rate should be was, of course, a different question, which he did not now wish to prejudge. He referred to the experience of the Glasgow Corporation, who, he said, gave a five-guinea flat rate telephone service. After five years the plant was valued by the Post Office at £258,000 and purchased at £305,000. Since then the Corporation had had to find £16,000 to make good the loss they suffered, and the Post Office had had to spend £100,000 to provide a really adequate plant. The experience of Glasgow Corporation was not one the Post Office would desire to follow, with the possibility of the result being the same; and he did not know on what principle the Glasgow Corporation advised the Post Office to have a five-guinea rate, unless it was on the principle of the fox in the fable, which, having lost its tail, wished the other foxes to lose their tails also.

These in substance were the Postmaster-General's observations on the rate question, and, as regards the past experiences of municipalities in the telephone field, he said: "In 1899 Parliament passed an Act which authorised the municipalities which desired to do so to undertake a telephone service, and it was made known that the Post Office would freely grant licenses to authorities which so desired. Of the many hundreds of authorities in the country in a position to take advantage of the offer 60 were known to have given close consideration to the subject. Of the 60 only thirteen applied for licenses, which were granted. Of the thirteen only six actually started a municipal service, and of the six only two now survived, two having been sold to the Post Office and two to the National Telephone Company."

It is indeed difficult to see what other decision Mr. SAMUEL could have come to or what other course he could have pursued in regard to the question of municipal telephony. To throw the provision of the telephone service of the country on unwilling and unprepared bodies at the instance of a few willing ones (which have not been conspicuously successful) must have resulted in a system of mixed controls and divergent policies which could not make for the fullest or even the moderately full development of a service of the highest public utility.

## THE TELEPHONE AND THE STRAIN OF MODERN LIFE.

FOLLOWING in the footsteps of the Bishop of Stepney, an "Elderly Business Man" in the *Daily Mail* takes up the plaint of overwork induced by telephones, motor cars and private secretaries. Man, we are told, instead of deriving additional ease from "labour-saving" inventions, becomes their slave, and crowds more and more work into his day until his nervous system reaches

the breaking point. Appendicitis, according to the writer's quasi-humorous deductions, is attributable to the telephone, measles to the motor car ; in other words, what the nerve-shattered community is really suffering from is telephonitis and motoritis.

In all this, of course, there is nothing new. In the early nineties, Dr. MAX NORDAU, in his widely read book *Degeneration*, cheered the spirits of Philistinism by maintaining that all it mistrusted most in Art, Literature and Music was tainted with degeneracy, and that this degeneracy was directly due to the restless hurrying, express-train epoch in which the artists and authors lived, moved and had their being. *Degeneration* is little read now, but a fresh explosion of the same type would assuredly have its eager and unquestioning readers, and it is safe to say that the diligent wader through the periodical and ephemeral literature of the last 50 or 60 years would be rewarded by finding articles laying the blame for the "strain of modern life" at the door of each successive invention of importance.

But what does this theory of nerve-straining amount to? When did the process commence, and how far are we to go back to find the evil genius who first set our feet on the downward path of degeneracy? Was it FAUST or GUTENBERG or CANTON who by multiplying the written word in the form of type first gave the fullest signification to the Preacher's words: "Of making many books there is no end"? It is so obvious that we hesitate to enlarge on the fact that every invention throughout the history of the world which has enabled man to do something a little quicker, a little easier or a little better than heretofore, has enabled him either to have more time for leisure or to crowd more work into his working hours. It is unreasonable to call a halt at the motor car rather than the railway train, at the telephone rather than the telegraph.

As regards the labour-saving devices especially referred to, we do not think the majority of busy men keep powerful cars with which to rush about the country doing 100-horse-power business. A far larger number must there be who keep them for recreative purposes. Private secretaries we had not imagined to be a particularly modern invention. Busy men have always kept confidential clerks to deal with such of their affairs as do not need personal attention. As to the telephone, we can only say that it is insufficiently used both in business and domestic life. If more reliance were placed on it, fewer sleeping and dining cars would be run, fewer letters written, fewer calls made. The telephone habit is not yet fully developed in this country.

Let us take a concrete case. The article referred to is based on the fact that quite a number of public men of both parties are (or were) broken down with over work. But it is notorious that the demands on members of Parliament have been growing steadily for a century. This is, of course, not due to the progress of science, but to the progress of democracy. More is expected of a candidate elected by a democratic electorate than from one elected by a limited electorate, and more was expected of the representative of a limited electorate than of him who sat in the interest only of the lord of the manor. As the population and business of the country increase twofold, fourfold and tenfold, so the demands made on the Government and on the Legislature must increase, and yet we expect the conditions of PEEL and

GLADSTONE's early days to obtain still, to say nothing of those of PITT and FOX. Why therefore blame the telephone and the motor car for the overworking of statesmen? Does the possession of these conveniences leave a man so much leisure as to make him desire to combine the offices of, say, Home Secretary and First Lord of the Admiralty? Is it not the fact, on the contrary, that the work of public men has grown so enormously from perfectly explicable causes that it would be an impossible burden without the aids furnished by progress?

HIC ET UBIQUE.

IT is a pity that the advocates of cheap telephone rates always seek to bolster up their case with such disgracefully inaccurate statistics. It is surely not impossible to obtain reliable information from abroad on the subject; it is certainly easy to obtain the correct rates in force in this country. Paragraphs have recently appeared in the Press with the following figures:—

	£	s.	d.
London (all-round service) ... ..	17	10	0
Hull " " ... ..	6	6	0
Portsmouth " " ... ..	5	17	6
" (small users) ... ..	3	0	1
Stockholm (minimum, with ½d. per call in addition) ... ..	1	2	3
Denmark (all-round) ... ..	1	0	0

Four out of the six figures are unreliable. It will be seen that 10s. has been added to the London unlimited rate. Of course, the error is on the wrong side. The Stockholm figure (as usual) we are unable to identify. The lowest rate we can find is one of 34s., with an entrance fee, in addition of 11s. 3d. It permits of 150 calls quarterly. What the all-round rate of £1 in Denmark may be, we utterly fail to conjecture. In Copenhagen there is a four party line rate of £1 13s. (large houses, city proper only) plus ¾d. for each call. This is, of course, a very different thing from an all-round rate for a direct line. In fact there are now no unlimited rates in Copenhagen. Even in Jutland and the small Danish islands the rates run from £2 15s. upwards. The £3 0s. 1d. Portsmouth rate refers, we suppose, to the recently raised message rate of £3, with an additional charge of a penny per call.

ISLINGTON seems to think there was too much Glasgow at the municipal telephone conference. At least, according to the *Islington Daily Gazette*—

Alderman Myers caused considerable amusement at the borough council by his report. Of the delegates, he said, nearly all were Scotsmen; he had never seen such an abundance of Scotch in any hotel. Glasgow, it appeared, wanted to have control of the telephones in that town. He did not know why they were so anxious. They had had them once and made a muddle of them.

At any rate they proposed to form a committee, but when they came to London they were only going to allow London with its 28 boroughs two representatives. He protested, but was ruled out of order. (Laughter.) Later they went before the Postmaster-General and heard the Scotsmen speak; it was difficult to understand what they said. The most businesslike man (with the exception of Mr. Walsh) was Mr. Herbert Samuel, who swept their arguments aside.

WE should be very pleased, if only for patriotic reasons, to be able to agree with Alderman Brown that Hull with its one telephone to every 24 inhabitants was the best telephoned area in existence, especially as 9,000 out of the 12,000 telephones in the place are National telephones. When he goes on to say that this beats Sweden and Denmark, the comparison of a town with a whole country is absurd. Stockholm, Copenhagen, Stuttgart, Gothenburg, Frankfurt and Hamburg, all have less than eighteen inhabitants to each telephone, while in America numerous towns have attained a development of one telephone to every seven or eight inhabitants.

THE improved talking over the new submarine cable between England and France has again opened up prospects of telephonic communication between this country and Germany, Holland and

Switzerland. Schemes are under consideration for obtaining connection with Basel and Zurich *via* Paris, and it is hoped to afford communication with Amsterdam, Cologne, Frankfurt and places considerably further distant *via* Lille.

THE system of telephony between moving trains and signal boxes, etc., invented by Mr. H. V. Kramer, is to be experimentally installed on the Stratford-on-Avon and Midland Junction Railway, says the *Electrical Review*. The apparatus consists mainly of a coil of wire wound round a railway coach, connected with the telephone instruments, and a wire laid alongside the track connected with instruments at stations and signal boxes. Communication is effected by induction between the coil and the wire along the track. A buzzer can also be installed on each train, which automatically warns the engine driver of the presence of another train on the same line within a radius of five or ten miles.

### GLASGOW STAFF DINNER.

THE annual dinner of the Company's Glasgow staff was held in the Grosvenor Restaurant on the evening of Friday, March 3. Mr. D. Johnstone Smith occupied the chair, and amongst others at the chairman's table were Mr. Wm. Alexander Smith, Mr. Stanley J. Goddard, Mr. Gill, Mr. Webber (Postmaster); Mr. F. Douglas Watson, Mr. W. A. Valentine, Professor Magnus Maclean (Technical College); Dr. T. Kennedy Dalziel; Mr. D. Stewart (Post Office Superintending Engineer); Mr. Macfee Glasgow (Post Office Telephone Department); Mr. John Scott, Birmingham; Mr. C. J. Millar, Glasgow; Mr. Stockens, Aberdeen; Mr. Brown, Dundee; Mr. Burnside, Kirkcaldy; Mr. Edmond, Stirling; Mr. Worte, Edinburgh; Mr. McFarlane, Galashiels; Mr. McDonald, Kilmarnock; Mr. Lamb, Greenock; and Mr. Whitelaw, Hamilton. There was a large and representative attendance of the staff in Glasgow and from other Scottish districts.

After the loyal toasts had been honoured the Chairman gave the toast of "The Company." He mentioned that he was the only member of the old staff who joined the Company in 1881 and was still connected with it in Glasgow, and went on to give some interesting details of the early circumstances of the Company. In these early days the Company's subscribers in those parts of the country in which it operated numbered only 1,000, with a revenue of about £15,000 per annum. The last balance sheet of the Company at Dec. 31, 1910, showed a gross revenue of close upon three and a half millions, with a net revenue of over £1,100,000. He went on to say that there was a feeling in the public mind that the public would not be so well off when the telephones were transferred from the Company to the Post Office, but he thought it was sometimes forgotten that the Telephone Department would be manned largely by the old staff of the Company.

In the course of his speech the Chairman paid a tribute to the memory of the late Lord Wolverhampton, a former President of the Company, whose services, he said, had been very great to his country as well as to the Company.

Before concluding, Mr. Johnstone Smith referred to the function as being in all likelihood the last of the kind which those present would participate in in their capacity as servants of the National Telephone Company. There could not, he said, be other than an element of sadness in that fact. If he had treated it lightly it was not because he or any of those present could feel it so. All must regret that their connection with the Company was drawing to an end. Its progress and the place it had taken in the commercial life of the nation had been very great, and he was sure none of them would ever forget the time they had served the great National Telephone Company.

The toast was coupled with the name of Mr. S. J. Goddard, who in acknowledging said that the Company was not dead yet. He had noticed that a certain number of gentlemen had gone to the Postmaster-General earlier in the week and had asked him to institute municipal telephones, while there were rumours of a Telephone Authority, and altogether they did not quite know where they were. He went on to refer to the loyalty of the staff and said it had been the envy of everybody. The Company had always set before it a high ideal in the matter of encouraging the staff to become more proficient in their work, and he instanced the Correspondence Classes with their 4,000 members, the 50 telephone societies with their 4,613 members, the payments made by the Company to enable members of the staff to attend technical classes and the awards by the education committee for meritorious suggestions as to the working and improved methods. In concluding Mr. Goddard ventured to say that when the Company did retire it would not go down to its grave "unwept, unhonoured and unsung," and that the staff would always be able to look back upon some good work done under the Company's auspices.

Mr. W. A. Valentine proposed the toast of "The Guests," and Professor Maclean responded. The toast of "The Chairman" was proposed by Mr. F. Douglas Watson.

While the dinner was in progress a telegram was sent Mr. Franklin conveying to him the heartiest good wishes of the Glasgow staff, and shortly afterwards a reply telegram was read by the chairman, in which Mr. Franklin thanked the staff for their good wishes and expressed hearty reciprocation.

An excellent programme of songs, readings and instrumental music was given during the evening by a number of talented artistes, and variety was lent to the proceedings at intervals by the "skirl" of the bagpipes. A happy and in every way most successful function ended with the singing of "Auld Lang Syne."

### THE SOLID BACK TRANSMITTER.

Address delivered by Mr. EMILE BERLINER before the Washington Telephone Society, Dec. 1, 1910, and reprinted (abridged) from the "Telephone News" of Philadelphia.

MR. CHAIRMAN AND GENTLEMEN: If we would divide the history of inventions or the technical development of science into off-hand periods, we could do so by starting with the time of the Greek mathematicians. We would then have to bridge over a considerable period until we arrive at the invention of the printing press in 1438. Then we would come to Newton's time and the discovery of the principles of gravitation and his celebrated work on Celestial Mechanics in 1675. Next there would be a century intervening when we would get to the steam engine in 1765. Then would follow photography in 1820, magneto-electric induction in 1831, the telegraph in 1844, the telephone in 1876, and finally the flying machine in 1904.

The telephone is distinguished in this enumeration because with it started a very marvellous development in science, and between the invention of the speaking telephone and the flying machine there were the following discoveries and inventions put before the world:—The talking machines, the commercial electric light, the Röntgen rays, colour photography, wireless telegraph, liquid air and radium. Of course, I do not mention a great many other important progresses in invention, but I would call those that I have mentioned "epoch making," and among them the speaking telephone undoubtedly ranks very high.

I do not believe there are many of you here to-night who can imagine the world without the telephone, and I thought I would give you a picture, in an off-hand statement, of 33 years ago, when there was no speaking telephone.

I lived in Washington then, as I do now, and there was one little store that dealt in electrical goods—the store of Mr. George C. Maynard. Mr. Maynard is still living, and is in charge of the Scientific Department of the National Museum, and I know he would enjoy being here to-night. He had a store on G Street, between 14th and 15th Streets—a little bit of a store, not larger than this corner here—and there were a few keys and sounders and bluestone batteries (they did not have any other to speak of) and some relay and some tapes, and some wire, and probably one or two more highly scientific induction coils and galvanometers. But that was all. That comprised the electrical stores of Washington. There was no commercial electric light, but there was at the Capitol, near the dome upstairs, a large room in which was a big battery consisting of about 100 so-called Smee cells. At that time these were very well known among scientific men. Each consisted of a jar full of sulphuric acid and water, a piece of carbon and a piece of zinc. That was a Smee cell. Of course, you know it polarised very quickly. On every 4th of July the daily papers announced: "To-night the electric light will be shown from the Capitol," and everybody was down on Pennsylvania Avenue. All at once we would see a brilliant arc light at the lower part of the dome. The electrician was at work. By and by it went out because the battery polarised, and then they had to wait about twenty minutes or a half an hour, and then we had another glimpse of the shining electric light. It was quite an interesting exhibition and everybody enjoyed it very highly. There were no dry cells known, and there was no electric bell. The house bells were mechanical. In the old times the bell wire was used, and every blacksmith or every locksmith knew how to fix the house bell, and from time to time the wire would stretch, or something of the kind, and they had all kinds of trouble with the bell. Of course, it was a pretty good-sized bell, and gave the old-time jingle such as you hear now and then in boarding houses.

Then there were horse cars. There were no electric cars, simply horse cars. Afterwards they had the cable car, and one day, as you may remember, the power-house was burned, and they had to supply horses for the cars. I recall that I then had the privilege of riding up to Mt. Pleasant in a mule car. They got the mules over in Alexandria to help out. Of course, that required some time to get around, but people had plenty of time then. If you wanted anything you had to send a messenger, and you could attend to

only two or three transactions a day, where you can now attend to a hundred with the aid of the telephone.

There was but one electrical paper in the United States, and that electrical paper was the official organ of the Western Union Telegraph Company, and was known as the *Journal of the Telegraph*. It came out once a month on a little bit of a sheet, such as you showed me, Mr. Chairman, relating to your own telephone journal—and there were one or two semi-scientific articles, and the rest was taken up with the official orders of the Western Union Telegraph Company.

Those were the conditions 33 years ago. Then came the Centennial Exposition, and Professor Bell has, in that connection, told you himself, I am informed, how he invented the telephone. I need say but very little upon the principle of what you know as the receiver to-day—a diaphragm, a magnet and a coil—while at the Centennial Exposition it was not an iron diaphragm, still it was a diaphragm, and the Bell telephone was used both as a transmitter and as a receiver. We did not have for several years anything of what is now known as a transmitter, except that the Bell Telephone Company, in the early years, put out what was called the box telephone, which was a large Bell telephone, as a transmitting instrument. You have no doubt seen pictures of them, or maybe an original instrument. Some are in the National Museum. The box telephone was fixed against the wall, and you spoke against it by getting quite close and pressing your mouth into the mouthpiece. Then you had the small telephone with which to listen. That was the system in 1877 and 1878, in the first telephone sets that were put out. The change did not begin until about the latter part of 1878 or the beginning of 1879.

I had become interested in the telephone in 1876. I had heard of the Bell telephone, although I had never seen it. I had thought of it, and I got some little electric wires and some other things from Mr. Maynard's store, and some batteries, and it occurred to me right away that the proper manner to transmit speech should be by means of the battery current. I thought since Mr. Bell had made the invention with the magneto current it might be possible to do it some other way, so I set to experimenting in the latter part of 1876, before the Bell telephone was fairly known, except to a few scientists or a few people who had seen it at the exhibition in Philadelphia. I was then clerking here, and I spent my leisure hours on Sundays and evenings in experimenting. It occurred to me that what I should be able to do would be to take a diaphragm and a contact-pin or screw, touching it in the centre, and in some way produce an undulatory electric current by continuous action of that contact, not by interrupting it, but by some way of continued current. I did not catch on right away to the pressure principle, but I thought if I would take a flat spring and attach that to a screw, I could adjust that spring against the diaphragm (and the current, of course, passing across the contact)—so that if I spoke against it, the pressure of each vibration would give a little broader contact of that spring against the diaphragm and thereby produce electric sound waves in the current.

That was the first idea, and I rigged up a sort of telephone, consisting of a membrane and a piece of spring in front, and I tried to transmit speech, but it would not work; somehow or other there was no action that I could discern. Of course, with the sensitive receiver of to-day it might get some results, but the real results would not be such that the flattening out of that spring would produce sufficient of variation to give sufficiently loud speech.

There was at that time here in Washington a gentleman named Richards, who was the chief operator of the fire alarm telegraph office. I knew him very well, and he invited me to come up and visit him at the fire alarm office. At that time, of course, they had the bluestone cells—I do not know whether they still have them—and the usual paraphernalia of instruments and of alarm bells, etc. One day—it was in the early part of 1877, in January, I think—I went up to see him, and since I had become interested in all kinds of electrical experiments, I had tried to learn telegraphy. I said to him, "I have been practising telegraphing, and I want to show you." He said, "Come back and let me hear what you can do." There was an instrument which was out of use, and I began to send an alleged message. He said, "Hold on, this is not right. You must press down a key—not simply touch it."

I said, "What difference does that make whether I press it down or not, if it makes a contact?"

He said, "Yes, but you have to make a *firm* contact; otherwise your message might not be readable at the other end; for instance, in long distances where the resistance is high, you have to press down considerably, in order to get efficient long-distance work in telegraphy. We use men for long-distance work exclusively because they naturally press down hard. Women would not do that, and therefore for long-distance work women are not adaptable."

That struck me very forcibly. I said, "do you mean to say that more current passes over that contact when I press hard?"

He said, "Decidedly."

I said, "All right. Good-bye."

I went home, and I knew I had it. I rigged up a diaphragm and made a contact with a steel button, polished it up nicely so as to make a clean contact (it is still in the National Museum in one of the cases). I began to adjust it, until the galvanometer showed the current. I then very gently pressed, and found that each time I pressed against it I got the galvanometer to deflect a larger angle, and I knew the principle was right. I want to say right here that my receiver was not in a good condition; it was still the old membrane, the skin membrane with a patch of iron glued to the centre. I had not then heard of Bell's further development of the iron diaphragm, which came a little later. It came out only in the patent of 1877, which showed for the first time an iron diaphragm. I did not know at the time that my instrument had an iron diaphragm—quite a good-sized diaphragm—and a steel button at the end of a screw, and while I connected it to the battery all at once I heard a sound coming from that iron diaphragm. I listened and I took my terminals and connected them off and on, and I heard a loud tick, tick, tick. That was strange to me. So I took a tuning-fork and tied one of the wires around it, to make an electric connection. I then struck the tuning-fork and held the prongs to the other wire, and, lo and behold, the sound came off that tuning-fork—came from the diaphragm. Now, I said, I have here something entirely different from Mr. Bell: I have a transmitter which is different from his, and a receiver which is different from his. And so I made two instruments, consisting of nothing else but an iron diaphragm and a steel ball, and I connected two of them, one upstairs and one downstairs in the building, three stories, I think. I had a friend talk into the instrument upstairs and I listened carefully downstairs, and I could plainly understand what he said. It was, I claim, the simplest instrument—electrical instrument—ever made for transmission and reproduction of speech.

Now, let me speak about the loose contact. It was something to be avoided in electricity. It was the rule, and it is to-day, that you screw everything tight; any other contact is a bugaboo in electricity. A loose contact is to be avoided, as it burns the terminals, or does something of the kind, and it does not transmit the current properly. I had, however, as I had showed you, found a way to utilise that which had been avoided before, and to make a speaking telephone out of it. Well, I tried hard to make the loose contact receiver talk loud. I continued experimenting in my leisure time, and in the early part of 1877, and I filed my petition for patent, first in the form of a caveat.

By and by I found that the trouble I had was that when I adjusted one instrument and went to the other one downstairs—or in a stable over in the yard—and adjusted it, before I got through the warmth of the current would bring that out of contact, and I could not transmit anything. It occurred to me, why could I not interpose two induction coils, and use the primary current on each end in circuit with each instrument, bring the secondary over the line, and again bringing it through the secondary of a second coil, affect the receiver or other contact instruments that way? That was the first time an induction coil had been used in telephoning. In fact, I got a patent for that the next year, before even there was any use for it, because the transmitter was not introduced until a year after I got the patent for the use of the induction coil. The idea worked, and for a long time during that year and the next I carried on experiments with friends of mine that way. The reproduction was faint, but it was there.

The telephone remained, so to speak, in obscurity. The people heard of it, but they never listened to one, or saw one. They thought it was a little plaything, and there seemed to be but little

progress made. All at once we heard that they had been used on longer distances, and a few people in Massachusetts were using it for intercommunication between their houses, but I was still here in Washington waiting for my opportunity. Then it was said that Mr. Edison had also invented a new telephone: I heard of that. He had what was known as the carbon button transmitter. He had taken some lampblack and compressed it into a button, and put two platinum discs on it. That was the old Edison telephone, and his idea was that when he spoke against the diaphragm and compressed that lampblack inside the carbon button he would get speech through that. He was on a tack similar to mine, only in some other direction. His idea was to compress loose conducting matter and get the undulation of the voice, so to speak, or have an undulatory current by that means. I want to point out here that in my earliest application, in the summer of 1877, there was shown a hard carbon button, so-called gas carbon (they did not have electric light carbon at that time; that came a year later)—and a round metal bead against it. That was to be used as a loose contact on the surface, not as Mr. Edison wanted to use his by compressing by a soft carbon button, and that figure is still on record in the Patent Office, and became a prototype of what was afterwards the Blake transmitter, of which I will speak later.

I told you that I filed my application for patent, and soon I was informed by my patent attorney that there was a big interference declared in telephone applications. There were not so many; they involved Mr. Bell and Mr. Gray and Mr. Edison, and one or two other people, of whom I had never heard, and myself. By and by the Bell Telephone Company instructed its attorney here, Anthony Pollock, to find out, among the applications in the Patent Office which were in interference with Mr. Bell, whether there were any which they had rather try and control. Mr. Pollock went over the applications and reported afterwards—so I heard—"The only application that you would want to control is that of Mr. Berliner, of Washington." Whereupon Mr. Thomas A. Watson, who was Mr. Bell's assistant, and who had been appointed Superintendent of the Bell Telephone Company, came to see me. I took him around to my little room on Sixth Street, between H and I, and exhibited to him my loose contact telephone, and he was very much surprised. He said, "We want that, Mr. Berliner." And soon afterwards Mr. Gardiner G. Hubbard sent for me and said, "Mr. Watson and Mr. Pollock tell me you have something valuable; we want that, and I would like to make a contract with you." By and by Mr. Theodore N. Vail, afterwards the president of the Bell Telephone Company, and now also president of the Western Union Telegraph Company, who was then superintendent of the Railway Mail Service in Washington, joined Mr. Hubbard and his associates.

He was very much interested in the experiments, as a matter of course, and after a while we drew up a contract, which I signed and the Company signed, and from that time began my connection with the Bell Telephone Company. But they had not gone into business as yet, and they did not need my active services. They only thought they would want me, and I said I was very anxious to get into a scientific field; I had a smattering of it and was studying and preparing myself. They said, "You will have to wait." The year went along until the summer of 1878—when they told me: "Now, we would like to have you come with us in September." Before that happened, I will say that I was taken sick and was in the hospital, but after I got out of the hospital I went to the office of the Bell Telephone Company in New York. Now, you must not imagine the Bell Telephone Company as you know it to-day. They had half a loft at 66 and 68, Reade Street, New York. That was their headquarters, and the *personnel* was Mr. Vail, Mr. Watson and Mr. Devonshire, who is still with the American Bell Telephone Company as general manager and assistant controller of the A. T. & T. Company, and my humble self. That was the staff of the Bell Telephone Company in the latter part of 1878, but during the summer Mr. Francis Blake, jun., had joined them. Mr. Blake was a scientific man, and was connected with the service here—the Geological Survey. He got to tinkering with transmitters and got on to the idea that the correct way to mount the two loose contact electrodes—that is, the carbon and the little bead—was to suspend them on two springs and let them lean against the diaphragm, and that became what was afterwards known as the Blake transmitter, and for a number of years the Blake transmitter

was considered the standard instrument. Mr. Blake had invented it, to be sure, but it was not in practical shape. Mr. Blake was taken sick before he finished it, and they asked me to come as soon as possible. I went from the hospital, and they said: "Mr. Berliner, you must finish that Blake transmitter for us; it is not entirely in shape. The thing is there, and works beautifully; the idea is correct, but it can't go on the market as it is. When we put it in adjustment at night, in the morning it is out of adjustment, and, of course, such a condition is out of the question." We could not make ten transmitters alike; they were all different. Each one had a separate adjustment, and the next morning they were out of adjustment. So on Feb. 1, 1879, we all went to Boston, and there the headquarters were established and remained ever since. My particular office was in the factory of Charles Williams, jun., who was the first man who made the telephone, and at whose place Mr. Bell invented the telephone. You will remember Mr. Bell's telling you how in the factory he was experimenting with Mr. Watson. I went there and worked on the Blake transmitter.

I soon found that the principal trouble with the Blake transmitter was in the carbon button. We cut up electric light carbons into buttons, and there was only the firm of Wallace & Sons, in Massachusetts somewhere, who made them. They were the only ones to be had. They made carbon pencils for the first time that could be used in a semi-commercial electric light.

Now, those carbon buttons were very soft, and the trouble was that the vibration of the metal bead would dig a hole into the carbon button and destroy the adjustment. So one day one of the firm came to see us, and I said: "Can't you make these carbon pencils hard?" He said: "Well, yes, we could make them harder, but they wouldn't be homogeneous, but would be full of little holes and all that, and that I suppose would not do at all." So I set to work. After thinking the matter over it occurred to me that if we would take some of those soft carbon buttons and send them to the gas works where they make gas in a retort, and put them in a cage and leave them there, that the carbon gas might condense itself on the surface of those soft carbon buttons and thus give us a coating of hard gas carbon. This could not be used in blocks, because it was too difficult to saw it; so I rigged up a cage, filled it with buttons and sent it down, and they sent it back the next day. When I opened the cage I was very much disappointed. The buttons had all shrivelled up, were partly burned, and the idea seemed to be an utter failure. But I took a piece of emery paper and rubbed off the loose burned crust from one of the carbon buttons, and all at once I could not rub any more; it was so hard that I could not rub it and it took the highest kind of polish. I then thought there must be some way of doing it without burning the carbon pieces. I was told how the thing had been put in the retort, and became familiar with the place in the retort where the carbon gas condensed. The next day I sent another lot down, and they came back without being burned, and gave the most beautiful carbon buttons, which were used ever since, and after a few more minor improvements we had no trouble with the Blake transmitter. We could make 200 a day, which was considered at that time a very large number, and we adjusted them, and they stayed there, working absolutely perfectly.

That was my practical work in the development of what was known as the Blake transmitter—the Blake type of loose contacts suspended on two springs.

Now something about the theory of the scientific principle of a loose contact transmitter. It is not so easy to explain. You have a loose contact and you press it. Now what happens there? You do not press it hard enough to make any mark, and yet you can speak to a loose contact, or speak in a Blake transmitter for years, and when you examine it there is no mark. What then is happening at that loose contact? The theories about this have been widely different, but my original one, which I arrived at very early, has finally been accepted, and that is this: I know that there are a great many of you here who have not studied physics, and yet it is now so simple a proposition that I think you will all understand it. Air is a conductor of electricity as well as a wire, the only difference being that a wire conducts electricity better; it has less resistance than the air. If I had a current, a spark, from a friction machine or from an induction coil, I could send it over quite a distance through the air. That shows that the air conducts electricity as



well as the wire; but it takes a higher voltage to bridge the air, and when you have a voltage like a flash of lightning you can bridge over miles of air. And you can make the air a conductor, as, for example, in the wireless telegraph, over thousands of miles, although the wireless telegraph works somewhat differently, there is the ether, which is a conductor, but air is undoubtedly in it. Now when you have a loose contact between, for instance, the metal and carbon, or between two metals or platinum, or anything, there is an intervening layer of air that can be shown by proper instruments, and when the current passes over that contact it has to pass over a very thin layer of air, and when you vibrate the diaphragm you increase or decrease the thickness of that layer of air, and that is what gives you these considerable variations of resistance which are necessary for the production of a speech current.

I forgot to mention to you that while the Bell telephone was employed independent of any other transmitter that you could use it both for speaking and for listening, as it used the magneto current, and after the discovery of the microphone you could use a loose contact both for transmitting and for receiving. It was found, however, after a short time that the best results were obtained in using Mr. Bell's receiver and the loose contact transmitter, so the two completed each other, taking part of one principle and part of the other, and ever since such a pair has been used. Other transmitters have been invented experimentally on scientific principles; for instance, liquid transmitters, gas transmitters and others, but the effective transmitter remains the same as it was 33 years ago—the loose contact.

There are a great many other interesting episodes in the early telephone history, but this really completes my connection with it.

[Note.—The so-called "long distance" transmitter, now in general use, was first evolved by Hunnings in England. The loose hard carbon granules therein form multiple loose contacts, and the idea of using several contacts being affected by the voice at the same time was mentioned by Mr. Berliner in his earliest patent paper. So was also the idea of having the primary of the coil on the line, mentioned in his earliest publication describing the use of the induction coil in 1877.]

## CORRESPONDENCE.

### THE LAST STAFF DINNER.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MAY I be permitted to point out that "Villen's" excellent proposal to signify the end of the Company's existence by a special social gathering is, as far as London is concerned, a little late in the day.

This suggestion was put forward at the end of last summer, and after receiving the hearty approval of the Metropolitan Superintendent, the King's Hall, Holborn Restaurant, was duly engaged for Saturday, Dec. 30, next.

The arrangements are in the hands of the Metropolitan staff dinner committee, of which I have the honour of being secretary, and whilst no details have yet been gone into, it has been decided that the entertainment shall be as far as possible one to suit all tastes. It will commence with a dinner, at which, for the first time I believe, ladies will have the opportunity of being present.

Dinner will be followed by a Cinderella dance, and those who do not care for dancing will find a concert or similar entertainment (possibly a dramatic performance) going on at the same time. Others again who prefer to smoke or to play cards will be able to do so.

I have little doubt that this unique occasion will see a record gathering, and it also seems safe to prophesy that a most enjoyable evening will be spent.

Full particulars will be announced later on, and the committee will certainly be glad to receive any suggestions from members of the staff with regard to the matter.

March 14.

JNO. H. BIGLAND, hon. secretary.

### WORD WANTED.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

It has very often occurred to me when making reference to a message received by telephone and having to describe such by the expression "Telephone message" that a word is required to take the place of this phrase.

Soon after the telegraph was invented a new word sprung into popular favour, the word "telegram." It expressed what the people wanted to say, so it survived and has been added to the language. No one has so far suggested a word to take the place of "telephone message." This I think opens up a very interesting field for thought, and I feel sure if any of your readers could suggest a word it would be of great public service.

I have given the question many hours of thought, but have not been successful.

Manager's Office, 17, West India Dock Road,  
London, E., March 7.

R. FERGUSON,  
Exchange Manager.

[Mr. Ferguson, perhaps, hardly knows what a terrible Nemesis he invites when he calls for a correspondence under the above head. The subject was dealt with in the Press in 1907, and in a defunct paper called the *Telephone* it was fully discussed under the very title "Wanted a Word" as far back as

1889. The most respectable word brought forward was *telepheme*, which, we believe, is to be found in some dictionaries. A New York contemporary which has embarked on the same quest has collected from the ingenuity of its correspondents a list of over 100 words, some of which are truly appalling monuments of misapplied inventiveness.—ED., "N. T. J."]

### SALE OF TELEPHONE DIRECTORIES.—BOLTON DISTRICT.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

As it was thought advisable from a service point of view and for other obvious reasons, it was decided to institute a canvass by telephone with a view to securing an increase in the sale of the January, 1911, issue of the Telephone Directory over that obtained for previous issues, and perhaps the result will be of interest to some readers of the JOURNAL.

I think that use of the trunk service in this district is somewhat greater than the average use and this should be taken into consideration in possible comparisons. The district comprises some 4,800 direct exchange lines, the annual takings in respect of Post Office facilities being £16,800, or approximately £3 5s. per annum per direct exchange line. It was decided to canvass subscribers whose accounts were of 5s. per month and upwards, this number being 1,250. Consequent upon pressure of other work, which all districts will no doubt appreciate at this period of the Company's history, only 1,174 subscribers were rung up, 251 orders, or 21 per cent., being received, of a value of £74 2s.; 33 per cent. of the total orders were from subscribers originating calls, etc., to a less amount than 10s. per month. The bulk of the business was in North-Western Province books, 211 being disposed of, the value of sales in respect of books of other districts and provinces, and complete and half volumes being £21 7s.

In comparison with the result, the cost may be said to be negligible, and may be estimated on a basis of a five minutes' talk per subscriber, the packing and despatch of the books sold and the invoicing and accounting of them.

As regards two of the four centres forming the district, the result may be said to be satisfactory, the result achieved in the remaining two centres being only moderate. This was due to a more liberal policy in the past as regards the supply, free of charge, of books in respect of districts within the same province.

Bolton, Feb. 20.

A. N. ENTWISTLE.

### THE LIGHTSIDE OF THINGS.—EXPLANATION OF THE MANX ARMS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

FOR long years historians have wrangled over the question "What is the explanation of the Manx arms (three legs of man)?" In revising my district map of junction lines I think I have found out the explanation, or at least an explanation that will satisfy telephone men. It is that our local junction system, which consists of three routes, stretches out from Douglas in the form of three legs to Ramsey, Peel and Port Erin.

These three routes may not be quite in the shape of human legs, but they are dog-legged enough in all conscience. I hope historians will accept this reasonable and practical solution of the mystery, and that all controversy on the matter will now cease.

Douglas, Feb. 28.

G. GILLMORE, District Manager.

A letter has been received signed "Not Sensible after Thirteen Years' Service," but the Editor is unable to publish communications over pseudonyms unless accompanied by the name and address of the writer.

## LONDON NOTES.

THE most important event of the month certainly the one which aroused most interest—was the Metropolitan staff dinner, held at Frascati's, on March 9. The one note of disappointment in the proceedings was the absence of Mr. Clay through illness; his place as chairman was taken by Mr. Harvey Love, Assistant Metropolitan Superintendent. Some amusement was caused by the rather cryptic wording of the principal toast, "'National' Telephones and National Telephones," which was proposed by the chairman. Mr. Goddard, General Superintendent, who responded, made a very happy reply. The whole proceedings were most enjoyable, and characterised by a heartiness which showed that the shadow of approaching changes had not tended to lower the spirits of the staff. The programme of music was excellent, not the least appreciated feature being the contributions by members of the staff; Mr. Bigland's topical song was very popular, while the singing of Mr. McGregor and Mr. Beck, and the violin solos of Mr. White, were all excellent. A photograph of the company was taken: the proof is in the hands of Mr. Bigland, who will be glad to show it to enquirers, and take orders for copies at 3s. 6d. each, which price will be reduced to 3s. if 50 copies are sold. The attendance was 257.

The intimation by the Chairman at the staff dinner that the dinner committee have engaged the King's Hall of the Holborn Restaurant for a final gathering of the staff on Saturday, Dec. 30, was loudly applauded, and has excited a good deal of interest. It is, of course, too early to do more than indicate the proposed arrangements. One thing, however, which is very clear and decided is that ladies must have the opportunity of being present; it has always been a source of criticism that hitherto a place has not been found for them at the annual dinner. In addition to a dinner, a dance, smoking concert, and card tournament are spoken of as part of the programme. There ought to be a bumper house, and it is hoped that each member of the staff will keep the date free, and decide at once to be present.

MR. J. H. PATTMAN, who has been busy this session reading papers before the London Telephone Societies, gave an excellent address at the operators' society meeting on March 8, on the method of handling the electrophone service of to-day. Without worrying his audience with complicated diagrams, he

explained the system lucidly by aid of cleverly designed models prepared by Messrs. Fuller and Harvey, of the Electrophone Department. The distribution of music is now arranged on scientific lines, so that all subscribers under the worst conditions get an approximately equal volume of sound which is not less than a certain fixed value. To enable this to be done, the equated values of all subscribers' circuits, consisting of receivers, local lines, and junctions to the Electrophone Exchange, have to be known, and, according to their values, so the grouping is arranged. The models consisted of coloured bobbins, the lengths of which were in proportion to the equated values of the various portions of some typical circuits. These bobbins were threaded on vertical rods, and the lines so built up were measured by means of a card with slots in it, the length of each of which was a measure of the permissible grouping. The colour scheme adopted in connection with this method of distribution was also made clear. The one regret of the author of the paper was that he was not able to give his audience a "hearing" by means of the loud-speaking receiver, which has yet to be invented. Mr. T. M. Oldham, Assistant Exchange Manager, Holborn, also read a paper entitled "Some Records and their Uses." He dealt in a most able manner with the most important points of the load line and other records from an operating point of view. The paper was illustrated by lantern slides, and was followed by discussion, which unfortunately had to be curtailed owing to the time limit.

RECENTLY illness of various kinds has been depleting the staff somewhat seriously; an epidemic of influenza has been responsible for the bulk of the sick leave. Many of the chief and senior officers have been absent, Mr. Clay, the Metropolitan Superintendent, and Mr. Edmonds, the Traffic Manager, having been among the latest victims. Both have now returned to duty, the former much better and the latter quite recovered.

ANOTHER epidemic, but of a much more pleasant and attractive nature, has been that of social gatherings amongst the staff. These have been so numerous that only a brief reference can be made to each. The North-East smoking concert, to which reference was made last month, was a great success; the hall was packed, there was a capital programme, and Mr. Tattersall, as usual, proved an able and popular chairman; after the "smoker" he was able to hand over £3 to the Staff Benevolent Fund. The Croydon traffic staff had an attendance of 110 at their "social," games, songs, dancing and competitions whiling away an evening which was all too short. The *fière de resistance* was a gentlemen's hat-trimming competition. Dalston staff had a similar gathering, there being over 100 present; an enjoyable time was spent, and Mr. Edmonds presented the prizes to the successful competitors. "Holborn" succeeded in securing an attendance of 274 at their whist drive, and as a result £2 10s. has been handed over to the benevolent fund; Mr. L. Harvey Lowe presented the prizes. The South-West staff also had a successful whist drive, and realised £1 3s. 5d. for the benevolent fund; Mr. Corner, Assistant Traffic Manager, presented the prizes. "London Wall" completes the list, also with a whist drive, at which about 200 were present; the arrangements worked smoothly, and the evening was voted a great success; Mr. Napier, of the Engineer-in-Chief's Department, presented the prizes.

THE London Telephone Society committee is to be congratulated on having given the members an opportunity of hearing a paper from one of the Company's provincial staff. Mr. A. Magnall, Engineer at Manchester, who acceded to the committee's desire that he should address the society on March 1, took as his subject "Recent Line Troubles." Mr. Magnall's freshness of style and thorough acquaintance with all branches of line work were much appreciated by his audience. There was a wealth of illustrative slides, showing samples of faults old and new, and enabling the lecturer to point his moral very graphically. There was a discussion and several interesting questions were raised by speakers. Now that the ice has been broken it is to be hoped that London will have further opportunities of hearing some of the well-known men in the Provinces; doubtless the Metropolitan men would be pleased to reciprocate.

THE Clay Challenge Cup semi-final between "Salisbury House" and "City" was played on Feb. 25. At call of time each team had scored three goals; extra time was therefore played, resulting in "City" scoring again and thus winning the match by four to three. The final between "City" and "South" was played on March 18, the latter winning by four to two, and thus becoming holders of the cup for this year.

TWO well-known members of the staff—Mr. R. P. Lowe, Divisional Contract Agent, North-East, and Miss Peet, Correspondence Clerk, Metropolitan Engineer's Office—have recently left the service, and were the recipients of parting gifts from their colleagues and friends. Mr. Lowe, who has accepted a position with the Provident Association of London, was presented with an American roll-top desk. He has been fourteen years in the Company's service, has been on the committees of the Benevolent Fund and Staff Transfer Association, and has acted as secretary of the chess club. The memento to Miss Peet took the form of a gold bangle and gold brooch. Both presentations were made by Mr. L. Harvey Lowe, Assistant Metropolitan Superintendent.

THE last meeting for the session of the London Telephone Society will be held on Monday, April 3. As it is the annual meeting, at which the election of officers and committee will take place, it is hoped that the members will turn out well. The successful papers in the annual competition will also be read. The attendance at some of the meetings during the session has been somewhat disappointing; the quality of the papers read, however, has been excellent, and if the committee can succeed next session in maintaining that high standard, there ought to be successful meetings.

THE Operator's Society has an attractive programme of competition papers for its meeting on April 10. The subjects are allocated to various sections of the

traffic staff, and are (1) "How to Acquire Early Proficiency in Operating"; (2) "The 'Wrong Number' Trouble"; (3) "Some Needed Reforms." There is also an open subject for clerks-in-charge, exchange managers and their assistants, and all male staff. The society has acquired the art of "whipping up" its members, so that there is sure to be a good meeting.

AN interesting incident, exemplifying the usefulness of the telephone, even when no reply can be obtained by the exchange, has come under the Company's notice. On Sunday evening, Feb. 26, the house of Mr. Hyde, General Manager of the Great Eastern Railway Company, was broken into by burglars, when all the family and servants were out. The whole of the silver in the dining-room and the valuables in the bedrooms were collected ready for removal, but the burglars evidently decamped hurriedly, leaving their booty behind. It is known that at 7 p.m. a call was put through to Mr. Hyde's number, and as the caller thought that an answer should be obtained, persistent ringing was kept up by the exchange; the police theory is that this ringing frightened the burglars.

## GLASGOW NOTES.

WE regret to report the death of George P. McGill, who since January, 1898, was employed with the Company as an Instrument Inspector, and had also charge of the Rutherglen sub-exchange. The deceased had been unwell for several months, and, as stated, died on March 10 of consumption. He leaves a widow and seven children, for whom much sympathy is felt in their bereavement.

The Company has generously given a gratuity of £25 to Mrs. McGill in view of her husband's long service.

The sixth meeting of the National Telephone Society (Glasgow and West of Scotland districts) was held in the Lecture Room of the Technical College on Wednesday, March 8, 1911, when Mr. C. J. Millar, the president, occupied the chair, there being some 35 members of the society present.

Two papers submitted in connection with the Head Office Premium Competition were read, one by Mr. J. M. Stewart, entitled "The Subscriber's Telephone Life," and the other, by Mr. James Forrester, entitled "The Why and the Wherefore of the Loaded Line." The subjects were dealt with by the writers in an instructive and interesting manner, and a vigorous discussion ensued, after which a hearty vote of thanks was accorded to the readers.

An adjournment was thereafter made to the refectory.

The annual business meeting of the society will be held on April 12, when the society have in view an entertainment in addition to the business proceedings. It is a matter of regret that the last two or three meetings have been so poorly attended, but it is hoped that every member will make a special endeavour to be present on Wednesday, April 12.

THE change-over of the Company's subscribers at Springburn to the new Post Office Exchange there was successfully accomplished on Saturday, March 18. In connection with Clydebank, the new No. 10 C.B. board which the Company are installing is expected to be in working order by March 29.

FURTHER, to our note of last month, it is with regret that we record the death of Mr. C. T. Grant, which took place at his residence at Hillhead, on March 1. Mr. Grant was well known in the business circles of the city. For a good many years he was with the N. B. Railway Company, but about 30 years ago he started business in the coal trade in Glasgow. Mr. Grant, on two occasions, was a candidate for the town council, but was unsuccessful each time. He was long a member of the Chamber of Commerce, taking a prominent part in the business of that body, and being responsible for bringing forward several important matters. As indicated in last month's JOURNAL, Mr. Grant was long a friend of the Company in Glasgow, and rendered useful service. A floral tribute was sent by a few members of the staff.

A VERY pleasant evening was spent in "An Old Oak Tea Room" on Friday, March 10, when the staff and friends of Argyle Exchange held a whist drive. There were three prizes for ladies and three for gentlemen, three of which were won by members of our own staff. Miss A. McNair, Supervisor, Argyle Exchange, won second prize, and Miss I. Pruvic, Argyle, consolation prize. The second prize for gentlemen was won by Mr. J. Gibson, Rentals Department.

THE sixth and last meeting of the session of the operators' society and club was held in the Masonic Halls on Monday evening, March 13, Mr. Rodger, Traffic Manager, presiding. Three short papers were read by Messrs. R. P. Crum, C. N. Carter and G. Edward, on "Junction Working," "Transfers of Exchanges" and "Service Observations" respectively. A number of questions were put and answered, the readers being thereafter accorded a hearty vote of thanks. Being the last meeting of the session, an extended social programme was given and much enjoyed. The opportunity was taken during the evening to present Mr. J. C. Kelly, Night Operator, who is going abroad, with a kit bag and a silver cigarette case, the former a gift from the members of the society and club, the latter from the night operating staff. The punctuality prizes for the evening were won by Miss Jamieson, Royal Exchange, and Miss Bain, Tron Exchange.

There were also presented on this occasion the regularity and punctuality prizes for the session. These were won by Miss Sharp, Milngavie Exchange, Miss I. Murray, Langside Exchange, and Miss E. Kemp, Argyle Exchange.

THE first meeting of the season of the Bell Golf Club was held at Carntyne, on Feb. 25, and the monthly medal was competed for. Only four couples turned up, but the result was close, Mr. H. Thomson (100 - 7 = 83) only getting home one stroke better than Mr. W. Stewart (100 - 9 = 84).

The members of the office staff and friends held their annual dance in the Trades Hall, Glassford Street, on Saturday, March 11, when about 75 couples were present. Messrs. J. D. C. Mackay and James Blair acted as M.C.'s, and the committee are to be congratulated upon arranging for and carrying out a most enjoyable function.

**SPECIAL COMPETITIVE PRIZE NIGHT—BRISTOL OPERATORS' TELEPHONE SOCIETY.**

By FLORENCE NICHOLLS, Clerk-in-Charge, Bristol.

This meeting was held at Bristol on March 2, 1911, by the members of the Bristol Operators' Telephone Society.

A special competitive prize night had been decided upon, and papers were invited from the staff on any subject pertaining to the telephone business generally, and operating in particular; each paper written had to be sent in under cover to the Bristol clerk-in-charge, and each writer was requested to append a *nom-de-plume* to the paper so that she would recognise it if successful in winning one of the many prizes offered.

In order that the competition might be open to all grades of the staff, and to avoid at the same time unfair handicaps upon the juniors and sub-exchange operators, the whole of the Bristol district operating staff were divided up into various sections, each section being allotted certain prizes which could be competed for by members of that section only. To obtain a better idea of these divisions it may be stated that there were seven such sections; the first four being for the various grades of staff in the Bristol Exchange, the fifth for sub-exchange staff Bristol area, the sixth for Bath centre operators, and the seventh for Weston-super-Mare centre operators. The prizes were evenly distributed between the sections in the ratio of one prize to five members of the staff, but the committee reserved the right to increase or decrease the number of prizes according to the number of papers sent in for each section, in order to maintain an equal proportion of prizes to papers for each section and to ensure competition for all prizes.

In all 47 papers were received, this being twelve in excess of the previous highest number (March, 1910). Not only was the number greater, but the standard was very much higher and showed the staff to be possessed of greater knowledge and insight into the reasons for the various methods adopted by the Company than ever before, and they also showed that the society, as a means of education, had been of great value.

The final decision of the committee was to award sixteen prizes (one prize to three papers), while the president (Mr. A. Perkins) and vice-president (Mr. R. A. Dalzell) very kindly consented to award special prizes for the most original and most humorous papers respectively; the competition for these two prizes to be open to the whole operating staff of the Bristol district.

The meeting commenced at 6.30 p.m., and from then until 7.30 p.m. extracts from various papers were read. These extracts were from all papers, quite irrespective of the fact of their being prize-winning papers or not, and the readers were not then aware which were the prize papers.

At 7.30 p.m. there was an interval of 30 minutes, and light refreshments were served round by the senior supervisor and members of the senior operating staff at Bristol; the whole of the refreshments being provided by the Bristol operating staff.

From 8 to 8.30 further extracts from the papers were read. The adjudicator, Mr. Alfred Perkins (District Manager), afterwards amidst much enthusiasm announced the various prize winners. Not until the *nom-de-plume* appended to each of the winning papers was announced, and the prize winner acknowledged it, was it known who had been successful. Mr. R. A. Dalzell (Provincial Superintendent) very kindly presented the prizes, and there was intense excitement when the two special prize winners were identified.

Below is given a list in detail of the awards:—

	Name.	Section 1. <i>Nom-de-plume</i>	Paper on
1st ..	Miss N. B. Hunt	.. "Transfer"	.. Imaginary Conversation between Two Telephones.
2nd ..	.. C. Cooper	.. "P. B. O."	.. P. B. Operating.
3rd ..	.. D. M. Bubbear	.. "St. Clair"	.. Divisional Working.
Section 2.			
1st ..	Miss I. M. Melrose	.. "Glory"	.. Efficiency.
2nd ..	.. E. Bromfield	.. "Portia"	.. Registration.
Section 3.			
1st ..	Miss W. K. Hook	.. "Portia"	.. Operating and Character.
2nd ..	.. O. K. Ferris	.. "Another Knut"	.. Co-operation and Encouragement.
Section 4.			
1st ..	Miss J. G. Robertson	.. "Onoto"	.. "Penny, Please."
2nd ..	.. D. E. Morris	.. "Rox"	.. Subscribers' Irregularities.
Section 5.			
1st ..	Miss W. Simmons	.. "Mercury"	.. Suggestions.
2nd ..	.. E. G. Kimberley	.. "Alice in Wonderland"	.. First Impressions.
3rd ..	.. M. Lawrence	.. "Rowena"	.. Things I Think About.
Section 6.			
1st ..	Miss D. M. Hall (Bath)	.. "Excelsior"	.. A Few Thoughts.
2nd ..	.. P. M. Kingsmith (Swindon)	.. "Observant"	.. People who Use the Telephone.
3rd ..	.. I. A. Garlick (Bath)	.. "Agatha"	.. General Rules and Regulations.

	Name.	Section 7. <i>Nom-de-plume</i>	Paper on
1st ..	Miss E. Vearncombe (Bridgwater)	.. "Crocus"	.. Recipe for Standard Operator.
	Miss N. B. Hunt	.. "Transfer"	.. Imaginary Conversation between Two Telephones.
	Miss W. K. Hook	.. "Portia"	.. Operating and Character.

After the adjudication and awards had been completed Mr. A. E. Coombs (Traffic Manager) proposed a cordial vote of thanks to the president and vice-president for their services and assistance to the society during the term of its existence (November, 1907, to March, 1911) with the Company. He stated it had been thought by all members of the society that the usual formal votes of thanks were insufficient on a special occasion of this sort, and with the kindly help of the draughtsman (Mr. J. Pike) these votes were placed on record by means of a short illuminated and framed address, which was signed by all the members of the society. Mr. Coombs asked the president and vice-president's acceptance of these as a small token of the esteem in which they were held by the members of the society. The presentation was made with vocal honours ("They are Jolly Good Fellows").

The president (Mr. Perkins) and vice-president (Mr. R. A. Dalzell) responded, thanking the members of the society for the vote of thanks.

The meeting was a remarkable one, in that it had been the means of collecting together members of the operating staff from the furthest limits of the district, extending from Swindon to Wellington, and it was the unanimous opinion that never before in the history of the society had such an enjoyable and successful meeting been held.

**NEWS OF THE STAFF.**

Mr. F. W. FRANCIS, of the Engineer-in-Chief's office, was elected an associate member of the Institution of Electrical Engineers on Jan. 26 last.

Mr. C. S. WESTON, Chief Clerk, Guildford, who joined the inventory staff, has been presented by the whole of the staff in the Guildford district with a handsome case of cutlery.

Mr. C. WILLSHIRE, on leaving the Company's service to join the Naval Brigade, was presented by the District Manager with a safety razor shaving outfit from his colleagues.

Mr. F. KING has been transferred from Contract Officer, Exeter, to be Wayleave Officer and Draughtsman, Torquay.

Mr. R. J. SKELTON, Chief Inspector, Keighley, was the recipient of a slide rule and a pearl penknife on the occasion of his leaving to take up an appointment as Engineer with the Western Electric Company, Limited, Woolwich. Mr. Aked, the Local Manager, made the presentation on behalf of the staff.

Mr. J. GUNSTON, Resident Inspector, Ilkley, has been transferred to Keighley as Chief Inspector.

Mr. A. MURGATROYD, Inspector, has been appointed Resident Inspector, Ilkley.

Miss PHYLLIS OLIVE WHALEY has been promoted from Operator to be Assistant Fees Clerk, District Office, Nottingham.

Miss WINIFRED MERRETT, Record Operator, Cardiff Exchange, has recently been appointed Traffic Manager's Clerk. Miss Merrett joined the Company's service on Aug. 17, 1906, and after successfully filling the post of operator at the Cardiff and suburban exchanges was appointed Record Operator in June, 1910, to assist with monitorial and clerical work.

Miss WINIFRED SAUNDERS, who was recently transferred from Hull to Cardiff, has found it necessary to resign her position as operator owing to the serious illness of her sister.

Miss GWENDOLINE MARY CLARGO, Cardiff, has been promoted to be Supervisor vice Miss Warmington resigned. Miss Clargo joined the Company's service in April, 1904, and was made Senior Operator, February, 1907.

Miss WINIFRED VIOLET SAUNDERS, Operator, Hull, has been transferred to Cardiff Exchange, to fill the vacancy caused by the promotion of Miss Clargo.

Mr. WILLIAM STEWART, Storekeeper's Clerk, Glasgow, resigned his position on March 9 to join a commercial house in the Bridgeton district. Two days later Mr. JOSEPH GRACE, Rentals Department, left Glasgow to become Senior Clerk in the Company's office at Kilmarnock. Mr. Stewart was presented with a gold-cased Waltham lever, suitably inscribed, and Mr. Grace with a gold albert.

Misses ETHEL NICHOLSON and AMELIA REDHEAD, Operators of the Central Exchange, Newcastle-upon-Tyne, have left the Company's service to take charge of telephone departments in a large shipbuilding firm on the Tyne. Each was presented with a gold bangle by the operating staff.

**METROPOLITAN STAFF CHANGES.**

Mr. J. W. STAFFORD, Clerk, Contract Office, Sydenham, to be Local Engineer's Clerk, Croydon.

Mr. W. A. SOPER, Clerk, Metropolitan Engineer's Office, to be Draughtsman, Paddington.

Mr. J. THORPE, Acting Foreman, Sydenham, to be Faultfinder's Overseer, Hop.

*Traffic Department.—Transfers and Promotions, etc.*

Mr. THOMAS A. MASON, Test Clerk, North, promoted to be Assistant Exchange Manager, Paddington.

Miss ADA SMITH, Senior Supervisor-in-Charge, Woolwich, promoted to be Clerk-in-Charge, Lee Green.

Miss MARGARET BOOTH, Senior Supervisor-in-Charge, Lee Green, transferred as Senior Supervisor to Brixton.

Miss CONSTANCE BOLTON, Senior Supervisor, Brixton, transferred to a similar position at North.

Miss ELIZABETH HEUGH, Supervisor, Hop, promoted to be Senior Supervisor-in-Charge, Woolwich.

Miss NELLIE SMITH, Operator, London Wall, promoted to be Supervisor, Bank.

Miss MAY HARPER, Operator, Battersea, promoted to be Supervisor, Hop. She was presented by the staff on leaving Battersea with a silver-backed mirror.

Miss MILLICENT KILBURN, Supervisor, London Wall, transferred to a similar position in the Operating School.

On Miss LOUISE BRANWHITE'S transfer to Paddington she was presented with a "week-end" bag by the Holborn staff.

The following operators leaving the Company's service at the East Exchange received various presents from their colleagues:—Miss HILDA RUMBLE, brooch; Miss KATHLEEN ROOD, silver-backed brush and comb; and Miss ETHEL WAGHORN, silver-backed brush and a specimen glass.

Miss HENRIETTA EVANS, Supervisor, on her transfer to London Wall, received a brooch from the East staff.

Miss DOROTHY BATEMAN, Operator, East, transferred to London Wall, also received a brooch.

#### MARRIAGES.

Miss MAY ALEXANDER, Glasgow, who left the Company's service on Jan. 23 to be married, entertained the operators at Langside Exchange to tea, and was the recipient of a case of silver tea and jelly spoons from them, besides various gifts from individual members of the staff.

Miss RACHEL THOMSON, of the Operating Department, Glasgow, who left on March 2 to be married, was presented by the staffs in City and Royal Exchanges with a case of teaspoons.

Mr. E. J. TRIBE, Clerk (Audit Office), Head Office, was presented by members of the Secretary's staff with a handsome marble timepiece on the occasion of his recent marriage.

Miss KATE WARMINGTON, Supervisor, Cardiff, left the Company's service on Thursday, Feb. 23, in view of her approaching marriage. Miss Warmington joined the service as an operator in November, 1903, was made a senior operator in November, 1905, and was promoted to be supervisor in October, 1909. On leaving the service she was presented by the operating staff with a brass coal vase and a pair of coal tongs. The operators in her division presented her with a silver photograph frame, and several operators also made her various personal presentations as a mark of respect and esteem, with their best wishes for her future happiness and welfare.

Miss FANNY RATCLIFFE, Senior Operator, Widnes, upon resigning after thirteen years' service to be married, was presented by Mr. Chambers, the District Manager, on behalf of the staffs at Widnes and Warrington, with a chiming clock, silver cruet and two flower vases.

#### OBITUARY.

We regret to announce the death of Miss G. L. HAMILTON, Operator, Bristol, who passed away on March 2 last. The immediate cause of death was heart failure, consequent upon congestion of the lungs and rheumatism of the heart.

Miss Hamilton had only been off duty for three weeks. The Bristol operators and the electrical staff sent wreaths as a token of respect, and Messrs. A. E. Coombs (Traffic Manager) and N. B. Noble (Exchange Manager) attended the funeral on March 6 on behalf of the staff and as representatives of the Company. Miss Hamilton's death is felt very keenly by her former colleagues. She had been in the Company's service just over three years.

### LOCAL TELEPHONE SOCIETIES.

**Bath.**—The sixth meeting was held on March 1, when Mr. W. Sturge (Chief Inspector, Trowbridge) gave a comprehensive paper on "Instrument Inspection." An animated discussion ensued, contributed to by Messrs. Ashbee, Avery, Caswell, Cole, Griffiths, Parnell and Taylor, and as the whole field of "visits" was covered, many interesting and practical suggestions were made, and are in part likely to be given effect to. Mr. W. C. Owen (Local Manager) presided, supported by Mr. G. L. Preston (Engineer, Bristol), and practically the whole of the members were present and followed the paper with interest.

**Birmingham.**—The fifth meeting was held on Feb. 3, when ten-minute papers were read on the following subjects by five members of the staff:—"Cement," by Mr. T. Sherratt; "Soldering," by Mr. S. Lambert; "Duties of a Fault Clerk," by Mr. H. J. Cooke; "Progress due to Telegraphy and Telephony," by Mr. T. Morton; and "Dynamos," by Mr. G. Ashford. A good discussion followed, and the innovation was quite a success.

The sixth meeting was held on March 3, when Mr. J. R. Milnes read his paper on "The Power Plant," which was very interesting and instructive. A discussion followed.

**Birmingham Operators.**—The last meeting of the session was held on March 9. Miss H. Crowther took the chair, and a very interesting paper was read by Mr. Abbott, Central Exchange Manager, the subject being "A New Method of Answering Calls." The points dealt with were: Should a call be answered and partly completed before taking another call? The effect upon the plugging up period; speed of answer; operators' irregularities; actual connection and clear. Unfortunately the charts which were shown were only imaginary figures, so that it was not possible to prove the actual result, but an interesting discussion followed. After the meeting the prize money of 10s., 5s. and 2s. 6d. was given to Miss Fookes, Miss E. S. Phillips and Miss Lambert for the best papers read before the society at the last meeting, the subjects being respectively "Standard Expressions," "Exchange Messengers' Duties," and "Scraps from the Monitor's Table."

**Blackburn.**—The second meeting of the session was held on Jan. 27, when Mr. P. Cunliffe, Acting Assistant Engineer, Burnley, read a paper on

"Engineering, Construction and Maintenance." The subject was handled in a very interesting manner, and the author improved his points with some clever diagrams. Afterwards a discussion followed, and the proceedings were closed by a vote of thanks to Mr. Cunliffe.

The third meeting of the session was held on Feb. 17, when Mr. E. Hopper, Inspector, Blackburn, read a paper on "Wireless Telegraphy." During the course of the paper several interesting experiments were performed. After the discussion which followed Mr. Hopper was awarded a very hearty vote of thanks for a paper which must have taken some considerable time to prepare.

**Bournemouth.**—The fifth meeting of the session was held on March 8, when Miss Barratt, Supervisor, Bournemouth, gave a paper entitled "My Operating Experience," before a fair attendance of the staff, the chair being taken by the Acting Local Manager, Mr. W. J. Moore. Miss Barratt's paper showed evidence of much careful thought, the essentials of good operating being intelligently dealt with, and several modifications of the operating expressions were also suggested. At the subsequent discussion the many points raised were satisfactorily dealt with.

**Brighton.**—A meeting of this society was held on Feb. 27, when Mr. E. Hare, Assistant General Superintendent, gave a most interesting and instructive paper on "Time and Money." Mr. C. F. Moorhouse (District Manager) was in the chair. The lecture was followed by a short discussion. Considering the climatic conditions, which were abominable, the audience was a fair one and followed the paper with close attention.

**Bristol.**—The last sessional meeting of the society was held on March 16 when a paper was given by Mr. R. G. Alexander, Cost Clerk, Bristol District Office, on "Costs." The paper was a very lucid one and appealed to all members of the staff whether junior or senior. The differences between various allocations were explained and "the reason why" illustrated by means of diagrams. A keen discussion followed and many queries were raised to which Mr. Alexander replied in a very able manner. Mr. E. L. Preston (Engineer) presided and there was a good attendance of members.

**Cardiff.**—The last meeting of the society was held on March 9. Mr. S. F. Whetton was in the chair and there was a very good attendance. A paper was read by Mr. W. Edwards entitled "Improved Methods in Cable Construction to Suit Present Requirements in Telephony." The paper was an interesting one, dealing with the history of the construction of cables, and was followed by a good discussion.

**Cheltenham.**—The fourth meeting of the society, postponed from Jan. 26, was held on Feb. 23. An interesting lecture was given by Mr. Geo. R. Collings on "Relays," which was illustrated by numerous lantern slides, including two original working slides; 94.7 per cent. of the members were present.

**Cork.**—The fifth meeting of the session was held on Feb. 23 when Mr. D. J. Murphy gave a most interesting lecture on "X-Rays." There were practical illustrations, the necessary apparatus having been specially procured for the occasion from the Christian College, Cork.

**Cornwall.**—On Jan. 11 two papers were given, one by Mr. R. Harris on "Points Raised by the H.O. Engineering Inspector," which evoked a large amount of discussion. The other paper by Mr. E. Beare on "Maintenance of Small Exchanges" was very interesting.

On Feb. 8 an excellent paper was given by Mr. A. E. Ball, Chief Clerk of Plymouth, entitled "Office Organisation," which was much appreciated and created plenty of discussion. Mr. S. G. Tregillus, the newly appointed Local Office Clerk, was unanimously elected hon. secretary and treasurer in place of Mr. A. H. Mansfield, transferred to Plymouth. The president, Mr. G. Hooper, District Manager, was in the chair on each occasion.

On March 15 a paper was given by Mr. W. E. Walton, Electrician, Plymouth, entitled "Inside Engineering"; many valuable points, illustrated by diagrams, were emphasised and freely discussed. Attendance, 100 per cent. In the unavoidable absence of the president, Mr. G. Hooper, Mr. R. Harris, the vice-president, took the chair.

**Dover.**—The fifth meeting took place on Feb. 21, when Mr. P. C. Langridge, Chief Inspector, Dover, gave a paper on "Receivers." Mr. Langridge exhibited and explained several types of receivers of both obsolete and up-to-date patterns. Mr. E. Mannock followed with a paper entitled "The Gang Boy, his Duties, his Difficulties, his Opportunities, his Experiences, and to what he may Attain." Both papers evoked interesting and instructive discussion.

The sixth meeting was held on March 14, when the following papers were read:—Mr. J. U. Wood, Stores Clerk, Dover, "Stores Bookings and How they Affect the Inventory Schedules." This paper was very useful to the members of the staff who deal with the bookings, especially now that the Inventory is completed in the district. Mr. P. J. Mannock, Rental Clerk, Dover, "The State in Relation to the Telephone Industry." Mr. Mannock criticised the paper recently read by Mr. Laws Webb before the London Chamber of Commerce and published in the JOURNAL. Both subjects proved of educational value and led to much useful discussion.

**Exeter.**—A paper was given by Mr. H. Reid, District Manager, on Feb. 21, the subject being "Some Points on Engineering." The lecturer, with aid of blackboard, lent emphasis to many debateable points in connection with engineering methods adopted by the Company. From an educational standpoint the lecture was a great success and there was a good attendance.

A paper was given on March 7 by Mr. Brown, Stores Clerk, the subject being "Two Phases of Stores." A large amount of detail was dealt with in the paper and many interesting points were raised. There was a good attendance.

**Edinburgh.**—The fifth general meeting was held on March 6, Mr. J. Robertson, Chief Electrician, occupying the chair in the absence of the president, Mr. C. C. Worte. Three papers were read by members of the society: "Some Notes on the Supervision of Sub-Exchanges," by Miss A. C. Ferguson,

Traffic Department; "Measured Rate Accounting," by Mr. R. C. Wilson, Chief Clerk; and "Registration of Calls," by Mr. D. A. Christian, Switchroom Inspector. The two latter papers were illustrated with lantern slides, and held an additional interest for the reason that while Mr. Wilson dealt with the clerical work, which the measured rate system involves, Mr. Christian showed the practical registration of the calls, giving a thorough explanation of the circuits and apparatus in use for this purpose. There was a large attendance and the proceedings terminated with a general discussion.

**Hastings and Eastbourne.**—A meeting of this society was held at Hastings on Feb. 28, Messrs. Hickmore and Hickman-Clarke, of Hastings, giving a joint paper, entitled "Contract Work." Mr. Barker, of Eastbourne, occupied the chair. The paper was a very interesting and amusing one, and at the end a general discussion took place on several of the points raised.

**Isle of Man.**—The twelfth meeting was held on March 17, the Chief Clerk, Mr. W. Kelly, presiding. The Assistant Superintendent, Mr. Prout, was to have given a paper, but will not be able to do so till April. The District Manager gave a most interesting and instructive paper on "Secondary Batteries," illustrated by actual batteries and experiments. He pointed out that as these batteries were now coming into general use all staff should understand them. Considerable discussion took place after the paper had been read.

**Leicester.**—At a meeting held on March 3, at the Foresters' Institute, Mr. L. Harvey Lowe gave an address on the "London Telephone System," which was highly appreciated by the society. The lecture was illustrated by lantern slides. Mr. J. Ashton occupied the chair.

**Leeds.**—On March 15, at the Church Institute, the Engineer-in-Chief (Mr. F. Gill) gave a lecture on "Standardisation" (illustrated by lantern views) to an appreciative audience. The Provincial Superintendent (Mr. J. C. Chambers) presided.

**Liverpool and Birkenhead.**—The fourth meeting was held on Feb. 23, when Mr. Milnes (Head Office) read a paper, entitled "Power Plant." Notwithstanding the broad lines on which the paper was constructed, a considerable amount of detail was included, and the entire subject was treated in a most interesting and instructive manner. The lecture was greatly appreciated, and after a short discussion the meeting was brought to a close.

At the society's fifth meeting held on March 16, Mr. O. G. Lee presiding, Mr. Street (Head Office) read a paper, entitled "Dry Air Apparatus." Mr. Street prefaced his subject with a careful explanation of the general principles of pneumatics and hygrometry, as forming the basis of a clear understanding of the functions of the pumping plant and of the changes wrought in the condition of the air inside cables. Stimulated by the clear and intelligent treatment of the subject by the lecturer, the audience took great interest in the paper, as was amply confirmed by the instructive discussion which ensued.

**Luton.**—Mr. S. Moody, Local Manager, Luton (now on H.O. Inventory staff), gave on Feb. 20 an interesting and very useful paper on "Transmission." Some practical demonstrations were given on apparatus loaned for the occasion by the Engineer-in-Chief.

The sixth meeting of the session, held on March 6, took the form of a competition evening. Sixteen papers were read, each of not more than five minutes' duration, as follows:—Five, "Office"; four, "Electrical"; three, "Engineering"; and four, "Operating." There was a decided improvement in the general tenor of the papers over those read under similar conditions last year. The winners of the first and second prizes, respectively, in each section were—"Office," J. Ireland and L. Sherratt; "Electrical," C. E. Williams and V. Kendrick; "Operating," Miss Walker and Miss Nash; "Engineering," E. Goodwin and H. Parr. E. Goodwin also won the special prize for the best paper of the evening.

**Manchester.**—On Feb. 3 a paper was read by Mr. A. Stewart on "Electrical Osmosis," in which some of the peculiar effects of the positive and negative poles were detailed. Some of the practical applications of Osmosis to ordinary manufactures and also to telephony were described. The paper, which was instructive and enjoyable, was followed by a very interesting discussion.

The seventh paper of the session was read by Mr. G. S. Wallace, on Feb. 17, on "City Exchange, a Review of Twelve Months' Working." The president, Mr. W. Cleary, occupied the chair. Mr. Wallace described the methods of operating, and showed by means of lantern slides the circuits when working, also pointed out the development during the twelve months ending Dec. 31, 1910, also the organisation of the staff which has been necessary since the opening of the City Exchange. Mr. Wallace also gave details of operating, e.g., average time in answering subscribers' signals when calling and clearing the line, which showed that the standard of operating is improving. The paper, which was most enjoyable, was followed by a very interesting discussion in which the following took part:—Messrs. Staite, Crane, Magnall, McGowan, Westerby and Stewart.

**Newport.**—A meeting of the Newport staff was held on Feb. 23, when a paper was read by Mr. W. J. Marsh, entitled "Departmental Co-operation." Mr. G. Field was in the chair, and there was a good attendance.

**Newcastle.**—The fifth meeting of the session was held on Feb. 13 before an excellent attendance of both ladies and gentlemen, Mr. J. Gwyther occupying the chair. A paper was read by the Chief Clerk, Mr. E. Payne, on "Electrical Experiments." The subject, which principally covered alternating current, the induction coil and its possibilities, was thoroughly dealt with in both a theoretical and practical manner, and the numerous experiments carried out with the lecturer's own set of electrical apparatus proved his interest in and knowledge of the subject and was much appreciated by the members present.

**North-East London.**—A meeting of this society was held at Dalston Exchange, Kingsland Green, on Feb. 27, when Mr. F. Morley Ward took the chair, and a paper entitled "Power Plant" was read by Mr. J. Gardiner, in the course of which he described the different pattern and makes of motor generators,

troubles experienced with them and how to remedy them. He also explained the making and maintenance of them and of the accumulator cells. Mr. Gardiner illustrated his paper with several lantern slides, which were very interesting, afterwards a very good discussion was provided by the members.

**Nottingham.**—The fourth meeting of the session was held on Feb. 24, when Mr. J. A. Read read a paper on "Some Rapid Methods of Clearing Switchboard Faults." A most interesting discussion subsequently followed touching such points as order wire working on C.B. exchanges, tripping relay circuit on order wire junctions, details in connection with machine and manual ringing keys, their liability to break down in insulation, the cause of same, etc., and test circuits and their use when subscribers were engaged on trunk lines.

**Nottingham Factory.**—The last meeting of the session took place on March 10, Mr. Fenton being in the chair and 52 present, when the official reader, Mr. H. Wilcockson, read a number of short papers written by members on "The Care of D.C. Dynamos and Motors," "Pattern-making Metals," "Switchboard Plugs S.L. 7," "Batteries," "Our Telephone Society," etc. On a vote of the audience the short paper prize winners proved to be Messrs. J. W. Faulkner, H. M. Fisher and F. Peet. For the three best questions sent in calculated to elicit information of most value to the workshop staff the prizes had been awarded to Messrs. W. Kerr, C. Hope and J. W. Faulkner. Mr. W. H. Clayton secured the prize for the best contribution to the previous meeting's discussion, whilst for the ordinary papers given during the session the prizes had been obtained as follows:—First prize, £1 11s. 6d., Mr. C. Hope; second prize, £1 1s., Mr. G. Goodhand; third prize, 15s., Mr. J. W. Faulkner. Mr. Fenton congratulated the society on the session's work, and expressed the hope that the next session would be equally successful.

**Portsmouth.**—On Feb. 21 Mr. F. R. Luckham, Assistant Test Clerk, and Mr. H. C. Lewis, Learner, gave papers on "Accumulators" and "Testing Instruments" respectively. The subjects were dealt with in detail, and were very ably rendered. The lantern slides (some of which were drawn by the lecturers) were very comprehensive, and an interesting discussion ensued afterwards, which was taken part in by Mr. Morice, Mr. Pharo and Mr. Wainscot. The chair was taken by Mr. Stanley Wainscot, and the lecture was attended by Mr. S. J. Smith, District Manager.

On March 1 Mr. F. D. Latimer, of the Engineer-in-Chief's staff, gave a very interesting paper on "The Manufacture of D.C.L.C. Cables." The lecture was illustrated by lantern slides, and the whole of the process of cable making from the wire drawing to the covering and sheathing was dealt with in detail. Some very interesting models were shown and also samples of cable and methods of joining, etc., explained. A discussion ensued, and was taken part in by Mr. C. J. Phillips, Provincial Superintendent (who is also president of the Portsmouth Telephone Society, and who very kindly took the chair on this occasion), Mr. S. J. Smith, District Manager, Mr. Pharo, Mr. Morice and Mr. Bennett.

**Sheffield.**—The sixth meeting was held on March 15, Mr. J. Wrigley (Contract Manager) being in the chair. This meeting was reserved for the local staff prize papers. Three prizes were offered and the duration of each paper was limited to ten minutes. The winners of the prizes were—First prize: Mr. H. A. Stokes (Cashier) who gave a paper entitled "The Autobiography of a Telephone Agreement." Second prize: Mr. D. Thomson (Service Inspector) who read a paper on his visit to the new Post Office, Sheffield. Third prize: Mr. J. L. Wilson (Contract Officer) whose paper was entitled "The Duties of a Contract Officer." After each paper had been read there was a brief discussion on points raised in the papers. The District Manager (Mr. R. C. Bennett) distributed the prizes.

**Southampton Operators.**—The fourth meeting of the session was held on Feb. 28, when Mr. S. O. Allen, Traffic Manager, gave a lantern lecture entitled "Operating, Past and Present," the slides shown covering a period of 32 years with a range of equipment from the earliest type of switchboards to the present standard C.B. equipment. There was a record attendance of operators, amongst those present being a number of visitors from the sub-exchanges, in addition to members of the Inventory and local staff. A pleasing surprise was the attendance of the Provincial Superintendent, Mr. C. J. Phillips, who was on a visit to the district and, the slides shown covering ground which was familiar to him, both in the earlier days and latterly, he was able to supplement the lecturer's remarks with a valuable and lucid description of the various types of apparatus shown, interspersed with reminiscences of a humorous nature which were much appreciated. Amongst those contributing to the discussion may be mentioned Mr. W. Howe, Mr. Escott, Mr. F. W. Richards and Mr. Drabwell. At the conclusion of the meeting Mr. Phillips presented prizes to the following Southampton operators on behalf of the Operator's Society:—Miss Edith Morris, copy of Mrs. Browning's poems, for a paper with most useful points, and Miss Dorothy Turner, autograph album, for the best show in debate. The chair was taken by Mr. F. W. George, Contract Manager.

**Southern London.**—The meeting of this society took place on Feb. 15, with Mr. T. M. Inman occupying the chair. Two very interesting papers were read by Messrs. G. W. Livermore and S. T. Buer on "The Contract Department and its Relations to other Departments" and "Notes on Transmission" respectively. The majority of the divisional contract staff were present by invitation of the committee, and the common idea of a contract man hawking telephones was dispelled by Mr. Livermore's explanation of the wide and varied range of the work of his department. Mr. Buer, with the aid of several lantern slides and analogies, put his subject into plain words, and was congratulated by Mr. Woollard, D.M.E., who, as usual, was present.

**Swansea Operators.**—The sixth and last meeting of the session was held on March 8, when competitive papers by members of the society were read. Eleven prizes were awarded, the recipients being as follows:—Seniors: first, Miss A. Elston; second, Miss M. Cousins; third, Miss M. Merchant; senior juniors: first, Miss M. Sweeney; second, Miss G. Frood; third, Miss G. Tollick; juniors: first, Miss N. Atkins; second, Miss I. Dailey; sub-exchanges: first, Miss H. Bruen; private branch exchanges: first, Miss E.M. Thomas; second, Miss L. Rees.

Special awards were also granted to Misses E. J. Davies, N. Thomas and W. Rowland for excellent papers which had been read by them during the session. The prizes took the form of books, the presentation being made by the president, Mr. W. E. Gauntlett (District Manager). A pleasing item in the programme was the presentation to the president, vice-presidents, Messrs. W. H. Crook (Chief Clerk), W. J. Hodgetts (Engineer) and chairman of committee, Mr. A. G. Bristow (Traffic Manager) of volumes subscribed for by the members of the society, as a mark of appreciation of the services rendered by the recipients to the society. The attendance was large and enthusiastic, 95 per cent. of the members and fourteen visitors being present.

**Swansea.**—The sixth and last sessional meeting was held on March 15, the president, Mr. W. E. Gauntlett (District Manager), occupying the chair, when an excellent demonstration on "The Trials and Troubles of a Telephone Instrument" was given by Mr. H. Freshwater (Inspector). The nature of various instrument faults, in particular those occurring with Ericsson table instruments was explained and a demonstration of the best means of clearing same was given. An excellent discussion resulted, several members of the Instrument Department participating. Prizes for the best papers read during the session were afterwards presented, the recipients being Mr. A. L. Stanton (Acting Electrician), Mr. W. Caine (Faultsman), Mr. H. Freshwater (Inspector).

**Torquay.**—A paper was given on Feb. 20 by Mr. G. E. Williamson, Local Manager, entitled "Torquay Exchange Equipment." There was a good attendance, and the various kinds of apparatus were inspected by the staff with great interest.

**Western (Metropolitan).**—The fifth ordinary meeting of the session was held at Gerrard Exchange on Feb. 20, when Mr. J. C. Fuller read a paper on "Automatic Telephony." A description of the apparatus and working of the "Strowger," "Lorimer," and "Clements" systems was given. Lantern slides, kindly loaned by Mr. Hyde, of Sheffield, and the Regent Street Polytechnic, also diagrams lent by Mr. Laidlaw, of Messrs. Siemens Brothers, Limited, greatly assisted the lecturer to illustrate his very interesting paper.

**Wolverhampton.**—On March 10 a paper was given by Mr. G. Taylor on "Combustion Engines." He explained the various kinds of motors in use, illustrating their workings by models. The audience present, numbering about 36, appreciated the paper very much. The chair was occupied by Mr. C. H. Johnston.

## STAFF GATHERINGS AND SPORTS.

**Bradford.**—On Saturday, March 11, the Bradford operators entertained to tea 330 poor children of Bradford, who are on the books of the Bradford Cinderella Club. After the repast, a programme of songs, choruses and instrumental music was given by various members of the staff. The entertainment was highly enjoyed and hearty cheers were given at the close in recognition of the effort and generosity of the staff in providing the entertainment.

The fund was subscribed to by all departments, and a local benevolent society (with about 35 members) has been started as the result, and it is hoped that this number will shortly be increased.

**Guildford.**—A very enjoyable whist drive and social was held by the Guildford district staff and their friends on Friday, March 17, in the St. Nicholas Rooms. There were about 100 present, including the District Manager and Mrs. Ransley, the Mayor of Guildford, and a number of friends from the Post Office. A most enjoyable time was spent, and following the whist drive, dancing was kept up to the early hours. The prize winners were—ladies: Miss Gorrings (first), Miss Capp (second), and Mrs. Williams secured the consolation prize. Messrs. Tabor and Dearle secured the gentlemen's prizes in the order named. A pleasing feature of the evening was the Morris Dances given by the children of the Guild of Play, Compton, under the direction of Miss Osborn, by kind permission of Mrs. Watts, wife of the late R.A., who takes a great interest in these children. Mrs. Ouston's singing was much appreciated, as was Mr. Alf. Watson's clever clog dance. The M.C.'s were Messrs. B. H. Bayley and L. G. Cosh. The prizes were distributed by Mrs. Cosh.

**Torquay.**—The annual social gathering in connection with the telephone society was held on March 10 at the Struben Hall. The proceedings were opened by a short concert followed by a supper, at the conclusion of which dancing, cards and other amusements were indulged in. The evening was a great success.

**Nottingham.**—A very successful whist drive and dance, arranged by Miss Tait, the Chief Operator, Nottingham Exchange, took place at the Victoria Hall. Nearly 140 attended, including a good number from the Nottingham Factory. The prizes were obtained by Misses Scholey and Leverton and Messrs. Briggs and Warman. Dancing was continued until 2 a.m.

**Edinburgh.**—A most successful series was brought to a close on Friday, March 17, when the last whist drive for the season was held in Telephone House, a company of 60—including Mr. Worte, District Manager, and Mrs. Worte—being present. The play was very close, Mr. Wilson, Chief Clerk, and Mr. Lumsden, Traffic Manager, tying, necessitating the playing of an extra hand, which resulted in the latter being declared winner. The winning lady was Miss A. L. Taylor, who was successful also at the January meeting.

After tea had been taken Mrs. Worte presented the prizes, consisting of a perfume bottle and a silver inkstand. Mr. McStravick, of the switchroom staff, received the consolation prize.

**Sheffield.**—The members of the social club had their annual dance and whist drive on March 1 at the Baths Hall, Sheffield. About 250 members of the staff and friends were present, and a very enjoyable evening was passed. The winners of the whist drive were—(ladies) Miss D. Hebden first, Mrs. Jones second, and gentlemen, Mr. B. F. Robinson first, and Mr. C. Wellings second. The committee responsible for the arrangements were Misses Ibbotson, Straw and Green, and Messrs. Burnett and Harrop. The duties of M.C.'s were ably

carried out by Messrs. H. E. Harrop and D. Thomson (dance), and R. F. Jones (whist). Mr. Rowe, the genial hon. secretary, is to be complimented on again carrying out the arrangements for a very enjoyable evening. Amongst those present were Mr. R. C. Bennett, Mr. and Mrs. Wrigley, and Mr. and Mrs. Thyne.

A very enjoyable whist drive was held on March 18 at the Central Café, High Street, under the auspices of the Sheffield branch of the A.S.T.E., over 100 members and friends being present. The staff had the pleasure of a visit from Mr. Barr (Local Manager), at present on the Inventory staff.

**Bristol.**—A successful smoking concert was held by members of the Bristol staff on March 11 at the "Crown and Dove" Hotel, Bristol. Mr. E. L. Preston (Engineer) was in the chair, and he was supported by Mr. W. E. Babidge (Electrician), Mr. A. E. Coombs (Traffic Manager), Mr. J. F. W. Wonson (Prov. Supt.'s Chief Clerk), and others. Between 50 and 60 members of the male staff were present, and a capital programme was gone through, Mr. Lionel Saunders (Engineers' Office) being responsible for this. A cordial vote of thanks to the chairman was proposed by Mr. J. Allen and was accorded musical honours.

A very successful whist drive was held at Stuckey's, Wine Street, by the staff and their friends on Saturday, Feb. 18. A party of 150 assembled and a most enjoyable evening was spent. Eight prizes were awarded, four for ladies and four for gentlemen. The first prizes were won by Miss Morris and Mr. E. F. Blackmore for the ladies and gentlemen respectively. Mr. Alfred Perkins, District Manager, awarded the prizes, and Mr. Lamb acted as M.C. in a very efficient manner. The drive was once again organised by lady members of the staff, and proved to be a complete success. The committee were Misses Hagley, Lee, Knowlden, Jarrett, Cann, Jones, Fox and Rice, and already there is talk of getting up another before the season ends.

**Chester.**—The annual whist drive was held on Tuesday, March 7, and a very enjoyable evening was spent. The Inventory staff, who were then working in the district, very kindly joined the district staff, and we also had the pleasure of the company of several of the Post Office officials of the Inventory department.

**Llandudno.**—On Thursday, March 9, the Llandudno staff, including the Inventory staff and a number of friends, held their annual whist drive at the Cambridge Restaurant. Members of the staff from all parts of the centre were present and a very enjoyable evening was spent. A musical entertainment was also arranged after the whist drive, the chair being taken by Mr. J. G. Ferguson, Local Manager. Solos were rendered by Miss Rich, Llanrwst; Miss K. Jones, Llandudno; Messrs. A. R. Wallworth, Chester; R. G. Chambers, Carnarvon; T. E. Lysons and C. W. Brown, Llandudno. Mr. F. Hives, of the Inventory staff, kindly distributed the whist prizes.

**Huddersfield.**—The operators at this centre, together with their friends, about 120, held a very successful whist drive and dance on March 9. At the termination of the whist drive prizes were distributed by the District Manager (Mr. H. B. Sutcliffe), after which supper was served and dancing indulged in until the early hours of the following morning.

**Birmingham.**—The electrical staff held their annual dinner at "Ye Olde Royal" Hotel on Saturday, Feb. 25. About 90 sat down, including a good number of the Inventory staff at present stationed in this district. After the dinner a capital programme of music was given, the members of the Inventory staff contributing largely to this in a very capable and pleasing manner. The District Manager (Mr. Williamson), who was in the chair, made remarks at some length reminiscent of the telephone development up to the present time, and ventured a prophesy as to its future, finishing by toasting the Company. Mr. Cornfoot (Chief Electrician) proposed the toast of the visitors, which was drunk with musical honours. Mr. Shackleton responded on their behalf and proposed another toast to the Birmingham staff. Altogether a very enjoyable evening was spent.

**Southampton.**—The members of the staff held an enjoyable whist drive and musical evening at the Grosvenor Restaurant, Above Bar, on Feb. 22. Owing to the exigencies of the service it was not possible to arrange for a full attendance of the staff, but about 80 members, with their friends, attended, the company including a number of the Inventory staff. During the interval, Mr. Howe, the District Manager, on behalf of the staff, made a presentation to Mr. Fred. W. Richards, the Chief Clerk of the Hants and Dorset district, who had that day completed 25 years' service. The souvenir, which was subscribed to by all sections of the staff in the district, took the form of a massive marble clock. The result of the whist drive was as follows:—Ladies: First prize, ormolu brass clock (the gift of the District Manager), Mrs. Reeves; second prize, hatpin stand, Mrs. Haig. Gentlemen: First prize, silver-mounted biscuit barrel, Mr. T. Freeman; second prize, shaving mirror, Mr. Blanchard. Ladies' hidden number prize, hammered copper bedroom clock, Mrs. S. O. Allen. The prizes were presented by Miss Dorothy Howe, after which an attractive musical programme was submitted, among those contributing being Mrs. Hague, Miss Muriel Sutton, the Misses Rolls and Fitzjohn, Miss Gandy, Mr. Andrews, Mr. Howe, Mr. Moss, Mr. Read and Mr. S. O. Allen, the party breaking up at 11.30 p.m. Mr. F. George efficiently carried out the duties of M.C.

The third of a series of successful whist drives and musical evenings arranged by the staff took place on March 6. There was a large and representative gathering, the attendance including the majority of the "Q" division of the Inventory staff, who are at present engaged in the district, Mr. B. Waite (Divisional Officer, "Q" division), Miss Waite, Mr. W. Howe (District Manager), and Miss D. Howe. The result of the whist drive was as follows:—Ladies' first prize, morocco writing case, Mrs. Hague ("Q" division); ladies' second prize, brass photograph frame, Miss Bugden. Gentlemen's first prize, whist set, Mr. Drabwell ("Q" division); gentlemen's second prize, Russian leather pocket wallet, Mr. May. Ladies' hidden number prize, silver shoe horn, Miss J. Hall. After the prizes had been presented by Miss Waite an attractive musical programme was submitted, and after a hearty vote of thanks to Mr. F. W. George, who had carried out all the arrangements, the evening was brought to a close by the singing of "Auld Lang Syne." Mr. S. O. Allen, Traffic Manager, was responsible for the musical programme presented.