BRITISH NATIONAL COMMITTEE

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A NEW ERA IN TELEGRAPHY

by Sir Geoffrey R. Clarke

THE electric telegraph has offered the world a means of rapid communication for more than a century. It has outlived nearly every other public utility of its time and is the parent of the telephone and radio. The advent of radio has supplemented wire services to such an extent that, with the present prices for telegrams, there is little danger of traffic congestion over any of the main communication systems of the world.

During the past 25 years the telegraph has had many vicissitudes and has felt the competition of the telephone very severely, especially over short distances. It is indeed unfortunate that telephony has been used to some extent to suppress telegraphy, instead of to supplement it, as these two services are in essence complementary rather than competitive.

TELEGRAPH AND TELEPHONES

For the conduct of modern business, the rapid conveyance of typewritten records between distant points is no less important than communication by the spoken word. It is evident, therefore, that where two methods of electrical communication provide such widely different, but equally essential, facilities as the telegraph and the telephone, they should both be used to supply the needs of public communication. Nevertheless, in spite of a steady improvement in the design and construction of telegraph instruments and a more efficient and economical use of wire plant, there has been for many years past a constant decline in telegraph traffic and, sad to say, a substantial annual deficit in the telegraph accounts of nearly all European countries.

It is interesting to study the reasons for this unsatisfactory situation, in view of the enormous progress which is now being achieved in the methods of telegraphy. Until recently the telegraph has found itself mainly confined to administrations and operating companies, by reason of its complicated terminal instruments and the need for operators with telegraphic skill. The ordinary procedure for a telegram is, first, to write it out by hand, convey it to a telegraph office either by hand or by telephone, and then the message is transmitted, one letter at a time, with very often frequent re-transmissions before it finally arrives at the office of destination. It has then to be delivered by messenger or by telephone, and the same lengthy procedure has to be repeated before a reply is received. All this involves delay and the operating costs are considerable.

On the other hand, the telephone saves time and effort. It provides personal contact between subscribers and the operating costs are relatively low, so it is no wonder that it has steadily ousted the telegraph from its pride of place. Numerous schemes have been proposed for attracting telegraph revenue, but it has long been realised that until some simple instrument could be evolved that would substantially reduce operating costs, eliminate the special skill

required and provide better facilities for the business community, it would be impossible to save the telegraph from further decay.

TELEPRINTER SYSTEMS

The dawn of a new era came in 1910 when the first of the modern telegraph-typewriter machines, the machine now known generally as the "Teleprinter," was first put into commercial service in the United States. It resembled and was operated like a typewriter and messages were received direct in Roman characters on letter-sized paper. This ingenious machine eliminated the need for telegraphic skill and practically doubled the traffic output of the operators. Its design has been steadily improved, both in the United States and Great Britain, and it is now practically foolproof.

PROGRESS IN THE UNITED STATES

In the United States the telegraph plays an extraordinary part in the social and business life of the community. The Postal Telegraph Company links up all the big cities and towns of medium size, whilst the Western Union Company spreads its vast network of wires to about 25,000 places, many of them hundreds of miles from civilisation. These companies own the largest telegraph equipment in the world and have adopted the Teleprinter wholeheartedly, the former having over 10,000 and the latter about 24,000 in service. In addition, about 15,000 Teleprinters, or Tickers, are being used for stock quotations. In spite of the most highly developed telephone service in the world, these companies have succeeded in making the telegraph both popular and profitable.

Teleprinters are being used in practically every conceivable business, including banks, insurance offices, hotels, public utility companies, departmental stores, and innumerable general commercial organisations. They are not only applicable to communication between widely separated points, but are being used extensively between departments a short distance apart and in many cases in the same building. They are speeding up production in factories and replacing slow and expensive messenger services.

It is possible for Teleprinter systems to duplicate every type of telephone facility. A single Teleprinter at each end of the line permits transmission in either direction. With simple auxiliary apparatus, the line may be arranged for duplex operation so that simultaneous transmission may be obtained in both directions. Systems can be arranged with several Teleprinters on one line so that the operation of any sending machine causes all other machines to record the message, and control devices are available which will permit any station to select any other station in order to record the message at the desired point without the other stations receiving it.

To meet the growing telegraph needs of commercial organisations, the American Telephone & Telegraph Company have developed a large number of private wire services, the demand for which was greatly accelerated by the introduction of Teleprinters. The success of these private telegraph services created such a demand for person-to-person facilities that Teleprinter Exchange service, in which all connections are set up by switchboard operators in a manner similar to telephone service, was introduced in 1931. There are now over 10,000 subscribers and the growth is about 200 per month.

It is of interest to note that unattended service can be provided, thus permitting the receipt of Teleprinter communications outside business hours or during the subscriber's absence. The service is operated over an independent network of telegraph channels, largely provided by voice frequency carrier systems, which enable up to 18 Teleprinters to be operated simultaneously over one telephone circuit. The service is experiencing a tremendous growth not only because it is rapid and provides the authority of permanent records, but because it is cheaper than telephone service over moderate and long distances.

The following typical three-minute connections show the economy of Teleprinter exchange service as compared with telephones :

Stations	*Telegraph*	*Telephone*
NEW YORK-WASHINGTON ...	$0.60	$1.05
NEW YORK-CHICAGO... ...	$1.10	$2.50
NEW YORK-LOS ANGELES ...	$2.20	$7.25

PROGRESS IN GREAT BRITAIN

In Great Britain, as a result of the findings of a committee appointed in 1927, nearly 4,000 Teleprinters have been established in the Inland Service alone. The introduction of these modern machines has effected substantial savings in operating costs, the traffic output per operator being about double

that obtained by other systems. As a result of the measures taken to reform the service there is now an upward trend in telegraph traffic.

In providing an instrument which can be placed in the hands of the public, the Teleprinter has altered the whole aspect of telegraphy and opened up entirely new fields for exploitation. By an intelligent appreciation of this fact, the British Post Office appointed a committee in 1931 to examine the conditions governing the rental of private wire facilities as well as the technical possibilities of the vast system of cables. It was revealed that the existing rentals were out of harmony with modern conditions and, accordingly, a new scale of tariffs was evolved and is now in force.

Tariff A provides for Teleprinter transmission in either direction, though not simultaneously, and the Teleprinters at each end of the line, or channel, are supplied and maintained by the Post Office, the power required to work the machines being supplied by the renter.

Typical rentals for telegraph and telephone services are the following:

Distance	*Inclusive annual rental*	
	Telegraph	*Telephone*
50 miles	£300	£390
100 miles	£350	£800
250 miles	£450	£2,000
500 miles	£675	£4,000

The total number of private Teleprinter stations under Tariff A is now between 600 and 700, these being connected through various channels representing between 300 and 350 telegraph circuits.

In 1932, Teleprinter Exchange service was introduced, and there are now about 300 subscribers.

Any telephone subscriber renting two or more exchange lines may obtain Telex service on payment of £50 per annum for the rental, installation and maintenance of the Teleprinter and associated equipment. In addition the normal telephone call fee is payable for each call. The stipulation that at least two exchange lines must be rented is made in order to ensure access to the subscriber by telephone in the event of any prolonged delay on a Telex connection.

TELEPRINTER SERVICE IN EUROPE

Early in 1934 the German Reichspost introduced Teleprinter Exchange service between Berlin and Hamburg as the first stage in general adoption. This service, which operates on an automatic switching basis over an independent network of telegraph channels, has since been extended to many towns in Western Germany and there are now about 300 subscribers. For long distance connections, the rates are about half the cost of corresponding telephone calls.

Teleprinter Exchange service was introduced in Holland in 1935 and there are now 165 subscribers. There is a special time tariff for local calls and the service is operated over the existing telephone network, the rates for inter-urban calls being the same as for telephone calls.

Similar services have also been introduced in Switzerland, Denmark and Belgium.

There has, however, been much apathy and neglect on the part of European telegraph administrations in modernising their plant and operating methods, and they have not yet learned to realise to its full extent the tremendous revenue-earning possibilities of private wire telegraph services in commerce and industry. On the other hand, there have been considerable improvements in the telephone services which have accordingly experienced a colossal growth and which are now doing a great deal of work which could be more efficiently done by the telegraph. This situation is economically unsound and bad for the community. The telephone is indispensable for spoken communication and so is the typewriter for making business records, but it is only by combining these two vital needs that the functions of the telegraph can be satisfactorily fulfilled. There are numerous communications that can be better handled by the telegraph than the telephone, especially where language or phonetic difficulties arise, because it provides machine accuracy and furnishes both correspondents with a typewritten record of the communication.

There is also the advantage that whereas the telephone needs the presence of the person with whom it is required to communicate, the Teleprinter can receive and record messages whether anyone is present or not. There can be little doubt also that if cheap Teleprinter Exchange services were introduced over international lines they would prove highly attractive to the business community for urgent and long communications which cannot conveniently or economically be transmitted by telephone and for which no better alternative exists at present than the air mails.

CONCLUSION

The real future for the Teleprinter lies in its extension over the telegraph systems of the world, and once it gets established as an international means of person-to-person communication, it will grow in the same way as the telephone has grown, because the more people who come on to this system, the more will be forced to come on, as they cannot afford to be left out.

Despite the widespread growth of the telephone, the proportion of telephone subscribers to the total population is still small in almost all countries. In Great Britain the number is still under 3 millions, but the estimated population is 45 millions. In many other countries the proportion is smaller. This indicates that in times of business and social emergency the majority of people rely on the telegraph, which provides a rapid communication service within the reach of all classes and accessible to all parts of the country. It is vital, therefore, that the standard of efficiency of such an important public utility should be maintained at the highest possible level.

A cheap telegraph service is essential, and when the business public become more cognisant of the possibilities of the new form of telegraph, the demand for private wire and person-to-person services will increase rapidly. There can be no doubt that when European telegraph administrations are able to furnish both national and international Teleprinter Exchange services at rates which bear similar relationship with telephone service as those adopted by the American Telephone & Telegraph Company, this new form of communication will be adopted with enthusiasm by the business community and eventually make the telegraph quite as popular and profitable in Europe as it is in the United States. With its increase in Europe, a demand will certainly arise for Teleprinter service between Europe and the American continent, which could be readily provided by the latest form of submarine cable.

With the general adoption of Teleprinter services we are not likely to hear much more about deficits in telegraph accounts, and we may look forward to a new era in Telegraphy.

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