

distinguished candidate is available, for research in any branch of chemistry, pure or applied, and no restrictions will be placed upon the manner in which the prize is utilised by the recipient. The donors of the fund, explained Sir George Beilby, hope that the prize will do something to stimulate young research chemists to greater effort, form a not unworthy tribute to the memory of Col. Harrison, and serve to remind the chemists of the future how their science was employed in the cause of right and humanity.

Sir James Walker, president of the Chemical Society, in a brief speech accepted the fund and trust deeds, and the custody of the permanent memorial. Before unveiling the latter, Earl Crawford referred with sympathetic insight to the work of Col. Harrison during the war, and to the loss suffered by the country in the death of Harrison and the remaining Fellows of the Society whose

names are inscribed upon the memorial. He expressed the hope and belief that the prize fund would fulfil the desire of the donors to encourage the younger chemists in research, a purpose which Harrison had ever in his thoughts. The unveiling of the memorial was marked by the sounding of the "Last Post"; after a minute's silence the "Reveille" concluded a simple and dignified ceremony.

The permanent memorial (Fig. 1) is the work of Mr. Ernest Gillick; it is of singular beauty. The bronze medallion bears an appropriate representation of a trench scene at the moment of a gas alarm. It is set upon marble, the natural colour of which harmonises with the bronze. In the rooms of the Chemical Society the memorial finds a most fitting home, and it is satisfactory to know that, should the Society change its quarters, it will be possible to transfer the memorial to the new rooms. C. R. Y.

Long Distance Telephony.

MR. F. GILL, the "European Engineer-in-Chief" of the Western Electric Co., chose the subject of telephony over long distances, with special reference to the international problems of communication between the various countries of Europe, in his presidential address to the Institution of Electrical Engineers delivered on November 2. Incidentally he pointed out that the passive attitude of a Government, content to satisfy the public demand only, would never lead to an efficient service. The success of the "Bell-owned" companies in the United States is due to an intensive educational campaign coupled with construction well in advance of the demand. In the United States the number of telephone stations has been increased ninefold during the last twenty years, and there is now one telephone station to every 7.7 persons. In Mr. Gill's opinion a Government Department should earn something more than merely sufficient to pay its way. If this were done there would be no difficulty in getting the capital necessary to extend the business. With a large staff it is disastrous that the idea should prevail that profit-earning is of no account.

Mr. Gill stated that the "carrier" system has greatly increased the maximum load possible on given lines. In this system carrier waves of frequency between 4000 and 27,000 per second are used, and by means of "wave filters" they can be separated into different circuits without difficulty.

On the New York-San Francisco line there are four conductors which form simultaneously two physical, one phantom, and four earthed telephone circuits. They also form part of a varying number of telegraph circuits ranging from six to twenty. The introduction of the thermionic repeater in 1914 gave a great impetus to telephonic development. As many as 23 of these repeaters have been used in tandem without seriously distorting speech. Mr. Gill gave data to prove that the telephone system of the United States is in advance of European systems.

In conclusion Mr. Gill discussed the problem of improving the through telephonic system of Europe. In Europe there is no organisation to co-ordinate the forty local systems. If a line were constructed between London and Christiania it would probably traverse six intermediate countries. The direct distance between London and Bagdad is about the same as that between New York and San Francisco, between which daily conversations take place. Under present conditions through telephony in Europe can be of little value. Mr. Gill then suggested alternative schemes for international control and urged that every endeavour should be made to secure it. The telephone authorities of Europe should hold a conference to try to find a solution, for to be interested jointly in a flourishing telephone undertaking would increase goodwill among nations.

Low Temperature Carbonisation.¹

By Prof. JOHN W. COBB.

THE report of the Fuel Research Board for the years 1920-21 on "Low Temperature Carbonisation" has been awaited with interest in many quarters because the subject has been much debated, and it was known that experiments were being carried out by Sir George Beilby and his staff at the Greenwich experimental station. On one hand, the process has been spoken of in terms of unrestricted enthusiasm and optimism as providing a simple and general solution of the smoke problem through the smokeless solid fuel which was to be produced, and as yielding large supplies of liquid fuel for naval and other purposes through its promised high yields of tar. On the other hand, critics of the process have indicated some shortcomings. The gas yield is small, and the process of carbonisation as carried on at higher temperatures in the gasworks is paid for

mainly by the large volume of gas which can carry a much higher price per thermal unit than a solid fuel because each thermal unit is worth so much more in use. Again, one of the principal by-products of carbonisation—ammonia—can be obtained only in comparatively small quantity by low temperature carbonisation, and the tars are much less valuable by current standards than those produced at higher temperatures because they lack aromatic constituents and are deficient in some other respects.

Sir George Beilby, who signs this report, has approached the investigation in an entirely sympathetic spirit. As a matter of fact, he was busy with the subject before it excited the amount of interest which is now bestowed upon it, and in this report he has detailed not only the results of experiments carried out by the Fuel Research Board, but reviewed the work of other investigators.

In a preliminary review of the situation, Sir George Beilby points out that broadly speaking this country

¹ Department of Scientific and Industrial Research. Report of the Fuel Research Board for the Years 1920, 1921. Second Section: Low Temperature Carbonisation. Pp. iv+73+8 plates. (London: H.M. Stationery Office, 1922.) 2s. net.