

Gas, Coal, and Tar Research.

NEW research laboratories of the Gas Light and Coke Co. at Fulham were opened on July 26 by Sir Richard Threlfall; the ceremony was preceded by a luncheon at the Company's head office at Westminster, and was followed by an exhibition of apparatus and methods, and by visits to the experimental plant.

Like many a common word in the more primitive languages, the term 'research' bears a number of different shades of meaning according to the varying circumstances of its use. In its use of the term the Gas Light and Coke Co. intends that it shall cover the most careful and strictly scientific examination, both on a small and on an impressively large scale, of every phase of the production, application, and possibilities of their products; further, that it shall include the laying of a sure foundation for the future conservation of our national coal supply. Generous as the company has been in the endowment of research, the new development is not philanthropic in its conception, except in so far as it indicates a sense of public responsibility. Since the company decided to expend considerable sums of money in re-housing part of its scientific staff, and providing them with the most modern forms of apparatus so as to facilitate their functions both of control and of original inquiry, it is to be presumed that it is convinced that this course is what is generally called a 'sound business proposition.' Not only does benefit accrue to the company itself, and thus to its 20,000 co-partner employees, and to every one of its 1,250,000 customers, but also valuable support is rendered to the State in its examination, on a national basis, of similar problems.

It may be said, perhaps with truth, that the prospect of cheap electricity is not without its influence on the progressive activities of the gas industry; if such is the case, it is well that the margin available for competition between the two forms of power should be explored without delay. Probably the gas industry has yet sufficient breathing space before cheap electrical power becomes a serious competitor. Another and perhaps more immediate problem, and one to which the Gas Light and Coke Co. proposes to give closer attention in its new laboratories, is that of low temperature carbonisation. Briefly, the position, which is not uncontroversial, is as follows. Gas companies normally distil coal at a high temperature, because by so doing they obtain a high yield of gas of satisfactory quality; the tar, the composition of which is now fairly well known, yields valuable pure compounds useful, for example, in the manufacture of dyes and drugs. Moreover, the coke can be used for making power gas or carburetted water-gas, or for domestic consumption in special kinds of stoves. Meanwhile we continue to use raw coal in millions of domestic hearths, polluting the atmosphere with foul smoke, and ignoring the fact that this objectionable material proclaims the loss of a potential source of wealth. If, however, the coal is distilled at a low temperature, a rich gas is obtained in smaller quantity, and the 'coke'—which still contains 10 per cent of volatile matter—forms a smokeless fuel which can be burned in ordinary grates. The tar fraction, however, differs markedly from ordinary tar, being much more complex, and as Prof. Morgan said in his paper on the subject at the recent Chemical Industry Conference, this material has been studied only since the War. Naturally, the new method of carbonisation has its own problems concerned, for example, with the type of retort, the caking of the fuel, and the suitability of the gas

for ordinary use. Such, among others, are problems which the Gas Light and Coke Co. has undertaken to study.

THE LUNCHEON.

Nearly two hundred guests were entertained by the Company to luncheon. The Governor, Sir David Milne-Watson, who presided, said that the gas industry was founded upon, and is carried on by means of, the process of high temperature carbonisation; whilst the new process of low temperature carbonisation needed careful investigation, the older process still presented many questions which invite scientific inquiry. One of the chief problems was that presented by the tar fraction. The research laboratories would be separate from works control, but would be in close touch with that control and with practice. The Mayor of Fulham, Alderman W. J. Waldron, welcomed the improvement which had been effected, saying that it was clear that the company was in close touch with the march of progress, and that the country had good reason to be proud of its work. The company recognised the double duty of service to the public and consideration for its employees. Fulham, he declared, would probably find itself in the future in the centre of the struggle for supremacy between electricity and gas.

SIR RICHARD THRELFALL'S SPEECH.

During the course of his speech, Sir Richard Threlfall said: "Inventions such as the use of fire were made before records were kept, but we have copious records of later inventions, and very likely the earlier ones came about in a fundamentally similar way, as assumed and put forward by Charles Lamb in his Dissertation upon Roast Pig. First comes the chance observation by an individual gifted enough to seek for its implications, then the attempt to reproduce the phenomena by copying the original apparatus, then the attempt to distinguish essential from unessential parts of the process leading to a working theory, and finally the improvement and simplification of the operation under guidance of the theory, which itself is subject to continual extension and improvement. . . . The early gas companies were kept busy for many a year in competing with each other, in extending their distribution system, in a perpetual struggle with municipal authorities and even with parliamentary committees, and had not any great margin of funds at their disposal; moreover, their technical personnel was not, in general, of the highly educated speculative inventive class. During the prosperous days of the nineteenth century the gas industry, like many others, did not devote much time or money to work for the future."

Sir Richard then proceeded to outline the circumstances involved in the birth and development of the Department of Scientific and Industrial Research, with which he has continuously been associated, and referred to the part it has played in finding properly equipped young men to carry on its investigations. "I have gradually come to the conclusion," he said, "that there is plenty of raw material among the young men and women of this country, which only needs reasonable encouragement to form the personnel of a large research army. In short, the parents of this country must be assured that science as a profession is worth following from the financial point of view before their sons and daughters will be allowed to embrace a scientific career." Attention was also directed to the qualities which a successful laboratory director must possess, and to

the contrast between the facilities which are nowadays enjoyed in the pursuit of science and those which were available fifty years ago.

THE LABORATORIES.

There are three principal laboratories, a conference room and library, and an office, together with a number of subsidiary laboratories—including an optical laboratory, a photographic dark room, and a thermostat room—as well as rooms containing service plant, and store rooms. The services comprise high- and low-pressure gas, coal gas (as distinct from the mixture of coal gas and carburetted water-gas), compressed air, vacuum, water, steam, and electric power at 220 and 2–15 volts d.c. A special workshop for making experimental apparatus will be included in the second half of the building, to be erected later. No. 1 laboratory (2700 sq. ft.) is to be used exclusively for general chemical research; ample space has been left for movable tables, and there is an adjacent balance-room. No. 2 laboratory, reserved for technical and semi-large scale work, is being kept as free as possible from fixtures. No. 3 laboratory will be used partly for research and partly for the chemical control of the operations carried out at the Fulham works. The products of low-temperature carbonisation tests at Richmond will also be examined at Fulham.

For the occasion of the visit there had been arranged a comprehensive display, with explanatory notes, of apparatus and methods which are employed in the research and control work. Although it is possible to mention only a few examples, it was everywhere evident that much intelligent thought and care had been devoted to the exhibition. In No. 1 laboratory were to be seen apparatus for micro-combustion and gas analysis, the determination of the vapour pressure of naphthalene, the thermal decomposition of methane and ethane, the sampling of gases, pyrometry, the analysis of coke and pitch, and the cracking of gas oil. In No. 2 laboratory were demonstrated the recovery of benzol from coal gas by activated carbon, the combustibility of coke, and refractory materials. No. 3 laboratory was devoted to a representation of the dehydration of gas and its influence on corrosion, the analysis and density of gas, and the tests appropriate to the analysis of gas oil, benzol, coal, coke, tar, ammonia, sulphur, and naphthalene. The basement contained various types of calorimeter, optical apparatus, and plant. The visitors were also conducted over the experimental gas-producing plant, where high-temperature horizontal retorts were in operation, together with condensers, purifiers, sampling apparatus, speedometers, calorimeters, etc., an experimental tar still, and a Salerno low-temperature retort.

University and Educational Intelligence.

LONDON.—Dr. Alexander Robertson has been appointed as from Sept. 1 to the University readership in chemistry tenable at East London College. From 1922 until 1924 he was Carnegie research scholar at the University of Glasgow, and was awarded a Ramsay Memorial Fellowship but resigned in order to accept a Rockefeller International Science Fellowship for study at the Universities of Manchester and of Graz. Since 1926 he has been assistant lecturer in chemistry at the University of Manchester. He has published papers in the *Journal of the Chemical Society* on sabinol, pyrylium salts of anthocyanidin type, the synthesis of anthocyanins, and the syntheses of glucosides.

The title of professor of morbid anatomy in the University has been conferred on Dr. G. W. de P. Nicholson, in respect of the part-time post held by

him at Guy's Hospital Medical School. The title of professor of bacteriology in the University has been conferred on Dr. Alexander Fleming in respect of the part-time post held by him at St. Mary's Hospital Medical School. In 1919 and 1923 Dr. Fleming was Hunterian professor, and in 1928 Arris and Gale lecturer of the Royal College of Surgeons; since 1920 he has also been lecturer in bacteriology in the Medical School of St. Mary's Hospital.

In view of Mr. S. A. Courtauld's munificent gifts for the Institute of Biochemistry and the Medical School of the Middlesex Hospital, the title of the University chair of biochemistry tenable there has been changed to "Courtauld Chair of Biochemistry in the University of London."

The following doctorates have been conferred: D.Sc. in chemistry on Mr. S. Guhasarkar (Imperial College—Royal College of Science), for a thesis entitled "The Influence of Groups and Associated Rings on the Stability of certain Heterocyclic Ring Systems"; D.Sc. in geology on Mr. M. R. Sahni (Imperial College—Royal College of Science), for a thesis entitled "Studies in Jurassic and Cretaceous Terebratulids (Morphological, Evolutionary, and Zonal)"; D.Sc. in mathematics on Mr. Theodor Estermann (University College), for a thesis entitled "(1) On the Representations of a Number as the Sum of Three Products; (2) On Certain Functions represented by Dirichlet Series; (3) On a Problem of Analytic Continuation"; D.Sc. (Engineering) on Mr. John Hollingworth (Imperial College—City and Guilds College), for a thesis entitled "The Propagation of Radio Waves"; D.Sc. (Engineering) on Mr. G. A. Hankins, for a thesis entitled "A. A study of the Methods used in Determining the Hardness of Metals. B. Experiments on the Behaviour of Metals under Alternating and Repeated Stresses," and other papers.

MANCHESTER.—The Council has accepted the resignation of Dr. Alex. Robertson, assistant lecturer in chemistry, on his appointment as reader in chemistry in the East London College, University of London; and also of Dr. P. W. Clutterbuck, demonstrator of chemical physiology, on his election to a Beit memorial fellowship for medical research.

Miss Eleanor M. Jackson has been appointed demonstrator in chemical physiology.

THE trustees of the Busk Studentship in Aeronautics, founded in memory of Edward Teshmaker Busk, who lost his life in 1914 whilst flying an experimental aeroplane, have awarded the studentship for the year 1928–29 to Mr. J. J. Green, of the Royal College of Science, London.

THE Aitchison Memorial Scholarship of the value of £36, open to all comers and tenable for two years in the full-time day course in technical optics at the Northampton Polytechnic Institute (London), is being offered. The examination will be held on Oct. 1 and 2. Full particulars can be obtained from the honorary secretary and treasurer, Mr. Henry Purser, 42 Gray's Inn Road, London, W.C.1.

THE ninth series of "Methods and Problems of Medical Education" has been issued by the Rockefeller Foundation, N.Y. It deals with institutes of legal medicine, and descriptions are given of the principal continental institutes, such as those of Paris, Berlin, Vienna, Cracow, Rome, and Lisbon. In striking contrast to the fine buildings and spacious accommodation commonly provided abroad for the subject, Great Britain is singularly deficient in this respect, and is represented in the series by the two relatively small departments provided at Edinburgh and Glasgow.