THURSDAY, FEBRUARY 12, 1920.

ASSET AND OBLIGATION.

WE referred in our issue of January 29 to an appeal made by University College, London, for 100,000*l.* for the extension of its engineering school. The work done there since its foundation in 1828 has been of such outstanding value that it should stimulate a ready response in the form of generous subscriptions to the amount required for the desired extension. The need is now very urgent, as the college, like others, has been compelled to refuse a large number of applications for admission by well-qualified candidates owing to lack of accommodation in the lecture rooms, drawing offices, and laboratories.

University College was the first in London to establish a school of engineering, soon after its foundation in 1826, and it has maintained its courses of study in this branch of applied science ever since as a potent and living force. It has always had the advantage of the guidance of distinguished engineers for its teaching, and they have greatly assisted the advancement of engineering by their inventions and contributions to applied science, as well as by their distinction in practical engineering affairs. Among these in its early days were three Fellows of the Royal Society—Eaton Hodgkinson, a great authority on the strength and testing of materials, notably in connection with columns, and C. B. Vignoles, also widely known on questions relating to railways, while William Pole exercised a great influence on contemporary engineering as secretary of the Institution of Civil Engineers. Other distinguished men of a somewhat later period are George Fuller, the inventor of a well-known form of slide-rule, and the eminent electrician, Fleeming-Jenkin, who for a short period was professor of civil engineering.

The advent of Prof. A. B. W. Kennedy (now emeritus professor) in 1874 marked a new epoch in its influence on contemporary thought in engineering science, since it was mainly due to his efforts that engineering laboratory training on a practical scale was initiated, and this has now become universal. Besides this notable achievement, Prof. Kennedy's activities during his fourteen years as professor there were remarkable for their extent and variety; he was famed alike for his work as an original investigator in such matters as riveted joints, marine engines, boilers, and kinematical science, and as an authority on a wide range of civil engineering practice, and still later as one of the foremost electrical engineers of his time. The keynote to his success as a teacher was mainly derived from his clear exposition of principles and their application in well-devised experiments in the laboratory. The effect of his teaching may be traced in the successful careers of his many students, of whom perhaps the best known are Sir Ernest Moir, Bart., a leading authority on harbours and tunnels, and Sir Alexander Gibb, whose firm is responsible for the construction of H.M. Dockyard at Rosyth. Municipal engineering, under the fostering care of the late Prof. Osbert Chadwick, has now become an important department. In the field of electrical science Dr. J. A. Fleming, the present professor of electrical engineering, has, for more than thirty years, had a far-reaching influence, not only by his great gifts as a teacher, but also as an investigator of rare capacity, particularly on alternating currents and on wireless telegraphy and telephony. Especially important are the services which Dr. Fleming has rendered to telephony by the invention of the thermionic valve, but these are too well known to need recapitulation to scientific readers.

The engineering school at University College is an element, and an important one, in the University of London, the largest university of the Empire, in the richest city, and probably the least well off when its size is taken into consideration. In University College alone there are more than 2200 students, without taking into account the medical students in University College Hospital. There will be many more if its buildings can be enlarged, as they must be if the University is to do its proper work.

During the war the staff and buildings of the college, like those of similar institutions, were utilised to their fullest extent in scientific work of the highest importance to the effective prosecution of the conflict, and now that it has come to a successful conclusion the men who guide public opinion are unanimous in declaring that one of the most important duties is to provide our universities with adequate means for the scientific training of our most precious asset, "brains," for the future guiding and directing of one of our greatest industries. Civic pride in the University will, we hope and believe, be sufficient to ensure that the engineering students of University College do not lack the modest range of buildings and equipment required to give them their chance in life,

and for which its engineering committee now confidently appeals to the citizens of London to provide.

A very good start has been made by a contribution of 10,000*l.* from Lord Cowdray, with a promise of another 10,000*l.* when 70,000*l.* has been reached. The members of the family of the late Mr. Charles Hawksley have contributed 3000*l.* towards the extension of the hydraulic laboratory. Other gifts bring the total up to about 30,000*l.*, apart from Lord Cowdray's contingent promise. London is now offered an excellent opportunity of showing its appreciation of the asset it possesses in the engineering department of the college, and of discharging its obligations to an essential factor of modern progress. We look to men of means in the City and county of London to respond readily and generously to the appeal. Donations should be sent to H.R.H. Prince Arthur of Connaught, who is president of the Equipment and Endowment Fund, at his residence, 42 Upper Grosvenor Street, W.1.

INDUSTRIAL CHEMISTRY.

(1) *Industrial Gases.* By Dr. Harold Cecil Greenwood. (Industrial Chemistry.) Pp. xvii+371. (London: Baillière, Tindall, and Cox, 1920.) Price 12*s.* 6*d.* net.

(2) *The Condensed Chemical Dictionary: A Reference Volume for all requiring Quick Access to a Large Amount of Essential Data regarding Chemicals and other Substances used in Manufacturing and Laboratory Work.* Compiled and edited by the editorial staff of the Chemical Engineering Catalog. Pp. 525. (New York: The Chemical Catalog Co., Inc., 1919.) Price 5 dollars.

(1) A MELANCHOLY interest attaches to this book, which of itself would disarm any adverse criticism, even if such were called for. Its author, a comparatively young man, died on the eve of its publication. After a brilliant career at the University of Manchester, of which he was a Beyer Fellow, and where he graduated as a Doctor of Science, Dr. Greenwood worked as an 1851 Exhibition scholar for some years under Prof. Haber at Karlsruhe on the synthetic production of ammonia. During the war he became connected with the research laboratory of the Ministry of Munitions, and was engaged in the inquiry initiated by the Munitions Inventions Department on the industrial manufacture of synthetic nitrogen products. His services were recognised by the O.B.E. awarded to him in 1919. In a foreword to the book, Dr. J. A. Harker, under whom the author served, pays a graceful tribute to his memory.

Dr. Greenwood's published work and experience rendered him exceptionally well qualified to undertake the preparation of the book under review. We can unreservedly commend it. It is a well-written, scholarly production, judiciously put together with a conscientious determination to make it an accurate presentation of contemporary knowledge. As the author points out in his preface, its title implies a more comprehensive treatise than it actually is; many industrial gases, such as chlorine, hydrochloric acid, ammonia, acetylene, etc., find no place in it, as these are treated in other books in the same series. He confines himself to the gases of the atmosphere, hydrogen, the oxides of carbon, sulphur dioxide, nitrous oxide, and certain substances which have been used in gas-warfare, and he devotes a special section to fuel gases, on account, as he states, of the intimate connection of their methods of production with the general question of industrial gases.

The main subject of the book is introduced in a chapter on the more important fundamental physical and physico-chemical principles forming the basis of technical gas reactions, although no attempt is made to give a detailed theoretical treatment of the various generalisations to which reference is necessarily made. In this chapter the gases in general are treated comprehensively, and the numerical values of their various constants are grouped together in a series of tables. This method, no doubt, has certain advantages, as it enables rapid comparison to be made between individual gases, but when we come to their detailed study it involves a good deal of turning backwards and forwards. It would have added little to the size of the book, and would certainly have increased the convenience of handling it, if the various constants and factors had been repeated in the special accounts of the several gases. The author would seem to have been primarily concerned with the general principles of gas technology and their elucidation rather than with the minute treatment of individual gases. As might be expected from his experience, which had been latterly almost wholly directed to problems arising out of the war, such questions as the manufacture of hydrogen for aeronautical purposes and for the synthetic production of ammonia naturally receive special attention. Naturally also, he devotes much consideration to the question of gaseous equilibria and to that of heterogeneous catalytic gas reactions, without doubt among the most important matters in modern chemical technology. The entire chapter is worthy of the serious study of all engaged in the technical production of gases and in the