and an unrivalled capacity for work. By strenuous and undeviating application he rapidly succeeded in mastering the field, and in a few years he was ready to start developing a programme of his own that has resulted in some of the most far-reaching advances in biochemistry.

His chemical background inclined him from the start to a study of the biochemical activities of micro-organisms. Convinced by an early exhaustive review of the literature on this subject that the existing information did not reach much beyond providing a confusing picture of an almost endless variety of patterns, he began to look for unifying principles. How successful this search has been must be obvious to everyone who is conversant with the fundamental features of present-day biochemistry, which rests squarely on the concepts of the 'unity in biochemistry', and of 'comparative biochemistry' that Kluyver developed in the course of a very short time. These concepts have exerted a fertilizing influence on biochemical progress fully comparable to that which followed the introduction of the comparative anatomical and embryological approach into general biology. The foundation, inception and elaboration of these principles have been brilliantly presented by Kluyver in the series of lectures that he delivered in 1930 before the University of London, published in 1931 by the University of London Press under the title "The Chemical Activities of Micro-Organisms", and in the first two of the John M. Prather Lectures given in 1954 at Harvard University, and recently also published in book form ("The Microbe's Contribution to Biology", Harvard University Press, 1956). It is not too much to say that Kluyver's contributions have been instrumental in establishing the biochemical foundation for Darwin's concept of the monophyletic origin of living beings.

The recognition of the fundamental unity underlying the biochemical activities of extant living organisms should be attributed not only to Kluyver's philosophically inclined mind; equally significant for this development was his profound knowledge of the vast variety of microbes and his perception of their great biochemical potentialities. The possibility of using a particular bacterium, yeast or mould for the investigation of some specific biochemical process has been ably exploited in many studies carried out in his institute. During the first decade of his career as a microbiologist, Kluyver often expressed surprise and regret that this notion was not more prevalent, in spite of his ardent advocacy of its advantages in lectures and publications; he was too enthusiastic to be content with that form of mental inertia that impedes the speedy diffusion of novel ideas. But gradually his admonitions, supported by striking examples of fruitful applications, have had their effect, and developments during the past fifteen years have amply justified the high expectations he had for this type of approach, which has finally been used on a rapidly increasing scale. A consequence of this has been that general microbiology has come into its own as an important branch of biological science, and the reputation of the Delft laboratory has certainly not suffered from Beijerinck's retirement. In fact, the "Delft School" that has so strongly stimulated the rise of general microbiology is a term that properly refers to the period of Kluyver's leadership (see, for example, *Bact. Rev.*, 13, 161; 1949).

It is, however, not merely the scientific output that has made his laboratory one of the most sought-

after institutions, to which microbiologists from all over the world have come to learn from the master. It has been the experience of all who have worked there that he contributed far more than his vast factual knowledge and the penetrating insight of a fine scientific mind. For they have also been exposed to a noble personality who had a deep understanding of human behaviour and a profound appreciation of the meaning of individuality. His whole demeanour was an inspiring example of a life radiating encouragement, tolerance and compassion. This attitude compelled much more than respect, and created in his institute a warm and conspicuous atmosphere of enthusiastic, generous and effective co-operation, of love for work, and of personal responsibility.

The same characteristics also made Kluyver a highly valued adviser, and his services were more and more frequently solicited on important national and international committees, where his wisdom usually led to finding genuine conciliatory solutions rather than compromises for difficult problems.

His outstanding significance as a scientist has been widely recognized. Only five years after his appointment to the Delft chair he was elected to membership in the Netherlands' Koninklijke Akademie van Wetenschappen; during 1947-52 he served as president of its section for natural sciences. He was also a member of many foreign scientific societies; his election as foreign associate of the U.S. National Academy of Sciences, as foreign honorary member of the American Academy of Arts and Sciences, and as foreign member of the Royal Society may be specifically mentioned. Microbiological societies, such as the British Society for General Microbiology and the Society of American Bacteriologists, were proud to count him among their honorary members. A recipient of several honorary degrees and other marks of distinction, he was perhaps most deeply touched when he was awarded the Copley Medal by the Royal Society.

Now his active and productive life has come to an end. Nevertheless, his contributions to science and society will continue through the work of his numerous pupils in various parts of the world. They will be aware of the great obligations which their association with A. J. Kluyver has engendered, and which implies the desire to perpetuate his way of life, to the benefit of humanity.

C. B. VAN NIEL

Prof. J. M. D. Olmsted

JAMES MONTROSE DUNCAN OLMSTED was born of New England forbears at Lake City, Iowa, on May 21, 1886, and died at Berkeley, California, on May 26 just after his seventy-first birthday. Olmsted received an A.B. degree from Middlebury College (Vermont) in 1907 and four years later a B.A. from Oxford, where he was a Rhodes Scholar. He returned to the United States in 1911, served as professor of natural science at Shorter College, Rome, Virginia, and in 1912 became associate professor (later professor) of biology at Richmond College, also situated in Virginia, where he remained until 1915. During 1916-17 he held an Austin teaching fellowship (zoology) at Harvard, but he spent most of this period as a private in the U.S. Army, being demobilized in 1919 as a second lieutenant in the Sanitary Corps. After the War, J. J. R. Macleod made him assistant professor of physiology (later associate professor) in the University of Toronto. He remained there until 1927,

when he went to the chair of physiology at the University of California, Berkeley. In 1931 he was appointed Senior Fellow to the Committee for the Relief of Belgium.

During his years as a Rhodes Scholar, Olmsted spent much of his time in France and became fluent in the language, and he also acquired an extensive knowledge of French literature and history. Being historically minded, it was natural that he should turn to historical writing in physiology; this resulted in a number of excellent papers and in three notable biographies: Claude Bernard (1939), François Magendie (1944), Charles-Edouard Brown-Séquard (1946), all three of which may be regarded as definitive, since no comparable studies of these important contributors to physiology have appeared in any language. Olmsted's scientific interests were wide and ranged from the special senses, the subject of his five excellent chapters in Macleod's "Physiology and Biochemistry of Modern Medicine" (fifth

edition, 1927), to other aspects of neurophysiology and to carbohydrate metabolism, an interest inspired originally by Macleod. He published two of the pioneer papers on the action of insulin from the Toronto group—one under his own name on the effects of temperature, and another with A. C. Taylor on the action of insulin on oxygen saturation—both of which were submitted in April 1924 and appeared in the *American Journal of Physiology* for June of that year (69, 137 and 142).

Known as 'Olmic' to his closest friends, James Olmsted was by nature well poised but retiring, gentle in manner, the soul of kindness to students, and a quiet and most effective teacher. He took relaxation in music and painting, his medium in the latter having been chiefly water-colour. He was a member of the San Francisco Art Association, with which body he often exhibited. In a very real sense he was a physiologist in the best humanistic traditions of Foster and Sherrington. JOHN F. FULTON

NEWS and VIEWS

Pharmaceutics in the University of London:

Prof. H. Berry

PROF. H. BERRY retires from his appointment as professor of pharmaceutics in the University of London and from his office as dean of the School of Pharmacy on September 30. He commenced his teaching career in 1919 after service in the Royal Fusiliers, Royal Engineers and Royal Garrison Artillery during the First World War. His first appointment was at the Robert Gordon's College, Aberdeen, but he soon transferred to the College of Technology, Birmingham, where he initiated and developed the Department of Pharmacy. In 1934 he joined the School of Pharmacy, University of London—then called the College of the Pharmaceutical Society—where he held a University readership in pharmaceutics and was appointed vice-dean. In 1937 he succeeded Prof. J. H. Burn as dean, and the title of professor of pharmaceutics in the University of London was conferred upon him in 1944.

It is in a large measure due to Prof. Berry's appreciation some twenty years ago of the impact of the advance of knowledge upon pharmacy that the new conception of pharmaceutics has been developed. He clearly saw that the day of empiricism was passing and that modern needs called for the application of science and engineering to the erstwhile pharmaceutical arts. Furthermore, he recognized that increasing costs and the development of the subjects of the degree to honours standards presented serious financial problems, and he succeeded in persuading the University of London and the University Grants Committee to accept the main burden of finance. This fundamental change was accompanied by a complete revision of the government of the School, which was consolidated when a Royal Charter was granted in April 1952. The new premises in Brunswick Square are, and will remain, a tribute to his work. His contributions to research have been mainly in the field of pharmaceutical microbiology, and many of the forty-five published papers will come to be regarded as classical contributions to the science. Prof. Berry, like all busy men, has found time to serve on many national and international committees,

on the Pharmacopoeia Commission and on the revision committee of the British Pharmaceutical Codex.

Prof. Edward Shotton

DR. EDWARD SHOTTON has been appointed to the chair of pharmaceutics at the School of Pharmacy, University of London, in succession to Prof. H. Berry. Dr. Shotton is a senior lecturer in pharmaceutics and a recognized teacher of the University. He qualified as a pharmaceutical chemist from the College of Technology, Birmingham, in 1933 and was appointed in 1934 as demonstrator in the College of the Pharmaceutical Society. In 1939 he joined the research staff of Burroughs Wellcome and Co. at Dartford, and later was appointed head of the Development Laboratories. In 1939 he obtained a London B.Sc. (Special) with first-class honours in chemistry, and in 1955 was awarded the degree of doctor of philosophy for a thesis entitled "Interfacial Tensions between Benzene and Sols of Arabic Acid and its Salts". He is a member of the University of London Board of Studies in pharmacy, and of the Boards of Examiners for the Pharmaceutical Society and the Universities of London and Manchester.

Dr. Shotton has made valuable contributions to the re-organization of the programme of training in pharmaceutics for the B.Pharm. degree along the lines envisaged by Prof. Berry, dividing the subject into three parts: general pharmaceutics, pharmaceutical microbiology and pharmaceutical engineering science. It is confidently expected that Dr. Shotton's long experience as a teacher and his experience in the pharmaceutical industry will enable him to weld these three parts into a living entity, and that he will continue to develop the scientific aspects of his subject and maintain it in correlation with the progress of pharmaceutical industry. Dr. Shotton's research interests have included problems of sterilization, the entrainment of liquid during distillation, the interfacial tension of solutions of arabic acid, the physical properties of granules which may affect adherence on compression, the stability of emulsions and emulsifying power, problems of formulation, etc.