

of the Medical Research Council from 1934 until 1938 and from 1939 until the time of his death.

He was a great experimentalist, and his interests, both in physiology and pharmacology, were so varied that it is difficult to select a representative list of his discoveries. No one else knew so much about frogs' hearts and how to control them, and no one would have thought it possible to extract so much information from them. He found that the action of digitalis was dependent on the presence of calcium. He found that the washings from frog's heart and serum both contained unknown substances which increased the force of the beat. He published important studies of the pharmacology of peptone and of potassium. With Broom he devised a well-known method for the assay of ergotoxine. In 1927 he published a book on "The Comparative Physiology of the Heart", and in 1938 he published another on "The Metabolism of the Frog's Heart", which was largely based on his own work with various collaborators.

Clark's main interest was in the light thrown by quantitative pharmacological experiments on the fundamental problem of how drugs act. He wrote a book called "The Mode of Action of Drugs on Cells" (1933), and a supplementary volume to Heffter's Handbook called "General Pharmacology" (1938), in which he codified a large number of papers in this field. The original authors had treated their results in all sorts of ways, and reached all sorts of conclusions. Prof. Clark replotted, recalculated and tabulated their results by uniform methods. He

emphasized the danger of fitting simple curves to observations on complex living tissues by showing that the results could often be equally well fitted by several different simple curves. He cleared the air by demonstrating that "an intensive study of any particular pharmacological action nearly always results in showing it to be more complex than was at first supposed". His wide knowledge provided a very rich mine of examples to illustrate his arguments, which were upheld by many experiments of his own and his students. In all this work he was testing the validity of fundamental quantitative generalizations. He was seldom content with direct empirical observations of the effect of chemical structure on pharmacological action.

Clark's "Applied Pharmacology" was first published in 1923, and six more editions appeared in the next seventeen years. This book, in which particular emphasis is laid on experiments on man, has played an important part in the development of the science of experimental therapeutics; it serves as a link between the laboratory and the ward.

J. H. GADDUM.

WE regret to announce the following deaths:

Dr. Frank Haydon, formerly Secretary of Apothecaries' Hall and for many years oculist to the Southern Railway, on August 1, aged seventy-nine.

Dr. A. L. de Moraes Sarmento, the well-known Portuguese physician and Rector of the University of Coimbra, on August 11, aged fifty-three.

NEWS AND VIEWS

Sir Robert Robinson: First Paracelsus Medallist

A DELIGHTFUL function took place at the Dorchester Hotel on August 6, when the Swiss Ambassador, in an after-luncheon speech, presented to Sir Robert Robinson, F.R.S., Waynflete professor of chemistry in the University of Oxford, the Paracelsus Gold Medal of the Swiss Chemical Society. This is the first occasion upon which the award has been made, and it is gratifying that the Swiss chemists should recognize in this manner Sir Robert's pre-eminence in the scientific world. His versatility is such that he has enriched every branch of organic chemistry, but it is perhaps as a master of the synthetic method that he has gained special fame. His outstanding gifts in this direction became evident early in his career, when in 1917 he effected a synthesis of tropinone, noteworthy on account of its extraordinary novelty and simplicity. The concept upon which this and other alkaloid syntheses was based was a direct outcome of a comprehensive theory of biogenesis of plant products which was contributed to the Chemical Society in the same year, and which marked an epoch in alkaloid chemistry.

Other outstanding achievements in this field include a large number of inspiring memoirs on the indole group of alkaloids, the morphine group, including

a modification of Knorr's morphine and thebaine formulæ and finally the establishment of the correct structures of strychnine and brucine. Robinson's interests have, however, extended far beyond the alkaloid field. One recalls the brilliant work carried out in association with W. H. Perkin, jun., on the constitution of brazilin and hæmatoxylin; from this arose his interest in pyrylium salts, leading to elegant synthetic work on anthocyanidin structures and culminating in the striking achievement of the synthesis of the anthocyan flower pigments themselves, one of the finest pieces of research of our generation. And now another trail is being blazed, this time on the synthesis of steroids and sex hormones; here, as always, with Robinson's work, one is struck by the simplicity and freshness of approach and the ingenuity displayed in building up the required ring-systems. No account of Robinson's work would be complete without mention of his important contributions to the theory of organic reactions, crystallized finally in terms of modern electronic hypotheses relating to the nature of valency bonds. The theory which collates on a common basis a diverse mass of data in organic chemistry, has had an important influence in the development of the science.