

developed a lasting interest in their work and confidence that they could and should continue such studies long after they had left the University.

From the same desire to understand sprang her long and arduous struggle with the difficult 'Morphologische Analyse' of Walther Penck. Controversy raged around his work. She determined that easy access to what he said was necessary. The last weeks, before she went to Algiers for the 19th International Congress of Geology, were spent in reading the proofs of her translation of Penck.

"Land forms under humid and under semi-arid conditions are well known, by personal experience, to the majority of geomorphologists. But I, for one, have never seen the real desert." She tried while visiting South Africa to see Namib but only penetrated the Kalahari. She died in the Sahara, victim of her desire to understand.

Miss Boswell was too modest ever to think that she might have any original contribution to make to geomorphology. Her friends knew otherwise. But understanding was all that K. C. B. asked, and died in pursuit of it.

F. C. MILLER

NEWS and VIEWS

Royal Society : Awards of Medals

THE following awards of medals have been made by the President and the Council of the Royal Society : *Copley Medal* to Prof. P. A. M. Dirac, for his remarkable contributions to relativistic dynamics of a particle in quantum mechanics ; *Rumford Medal* to Prof. F. Zernike for his outstanding work in the development of phase-contrast microscopy ; *Davy Medal* to Prof. Alexander Robertson for his researches into the chemistry of natural products, particularly the wide range of glycosides, bitter principles and colouring matters containing heterocyclic oxygen atoms ; *Darwin Medal* to Prof. J. B. S. Haldane for his initiation of the modern phase of study of the evolution of living populations ; *Buchanan Medal* to Sir Rickard Christophers, for his outstanding research on malaria and on the *Anopheles* mosquitoes which transmit that disease ; *Sylvester Medal* to Prof. A. S. Besicovitch, for his outstanding work on almost-periodic functions, the theory of measure and integration and many other topics of theory of functions ; *Hughes Medal* to Prof. P. I. Dee, for his distinguished studies on the disintegration of atomic nuclei, particularly those using the Wilson cloud-chamber technique.

Nobel Prize for Chemistry for 1952 : Dr. A. J. P. Martin, F.R.S., and Dr. R. L. M. Synge, F.R.S.

THE Nobel Prize for Chemistry for 1952 has been awarded jointly to Dr. Archer John Porter Martin, head of the Physical Chemistry Division of the National Institute for Medical Research, Mill Hill, London, and Dr. Richard Laurence Millington Synge, biochemist at the Rowett Research Institute, Bucksburn, Aberdeenshire. Dr. Martin, after taking Part II of the Natural Sciences Tripos in biochemistry in Cambridge, worked at the Nutrition Laboratory there during 1934-38, mainly on vitamin E and nicotinic acid. Dr. Synge, who had also been trained at the School of Biochemistry, Cambridge, soon became interested, after a short spell in carbohydrate chemistry, in the analysis of proteins. The empirical methods then available for separating the complex mixtures of amino-acids present in protein hydrolysates were unsatisfactory in many respects, and Synge therefore investigated the possibility of separating the N-acetyl derivatives of amino-acids by partition between water and other solvents. In this early work, which was published in 1939, conventional extraction procedures were used. Realizing the relative inefficiency of these methods, Martin and Synge, who had now joined forces, designed and put into operation an all-glass apparatus

based on counter-current principles. In 1938, both Martin and Synge accepted appointments at the Wool Industries Research Association laboratory in Leeds, and there ensued a close collaboration in which the respective capacities of these workers complemented one another in an ideal manner. It was realized that bulk extraction procedures were inferior to chromatographic techniques, and Martin and Synge conceived the idea that a combination of the principle of solvent partition and a chromatographic arrangement might be the solution to their problem. They soon found that a system consisting of water-saturated silica as stationary phase and a suitable organic solvent as mobile phase was satisfactory for their purpose. However, the acetylation step was somewhat cumbersome, and attempts were made to separate the amino-acids themselves. It was soon shown that cellulose was suitable as supporting material, and a logical extension of these findings led in 1944 to the development of the now generally familiar paper chromatography. A further and most important extension of these ideas led Martin (now at Mill Hill) to the development of liquid-gas partition chromatography.

Liquid-liquid chromatography, and especially paper chromatography, which were developed originally for the analysis of amino-acids, are now being used in almost every field of organic and inorganic chemistry and biochemistry. The application of these methods especially to the structure and metabolism of natural compounds has made possible advances in our knowledge which would have been considered impossible ten years ago. There has been during the past decade a widespread interest in the general problem of separation of small amounts of closely related substances, in no small measure due to the work of Martin and Synge. The development of synthetic ion-exchange resins, the various modifications of adsorption chromatography and the elaboration of bulk counter-current extraction methods have greatly increased our range of techniques. But the methods evolved by Martin and Synge are probably unique by virtue of simplicity and elegance of conception and execution, and also by the wide scope of their application. This field is still expanding, and it is likely that the invention of liquid-liquid chromatography will be considered by future generations as one of the more important milestones in the development of chemical sciences.

Dr. W. G. Penney, F.R.S.

THE recent announcement, recorded in *Nature* of November 1, that Dr. W. G. Penney has been promoted to be knight commander of the Civil Division