

eruption of repeated differentiation cycles of basic and alkaline volcanic rocks.

During his life-time Benson received many honours. He was a foundation Fellow of the Australian and New Zealand Association for the Advancement of Science, and its Mueller Medallist (1951); Fellow of the New Zealand Institute, later Royal Society of New Zealand (1926); Hector medallist (1933), Hutton medallist (1944) and president (1945-47) of the same Society; Lyell medallist of the Geological Society (1939); Fellow of the Royal Society (1941); Clarke medallist of the Royal Society of New South Wales (1945); correspondent of the Geological Society of America (1949); honorary D.Sc., University of New Zealand (1951), and honorary member of the Mineralogical Society (1954).

Benson looked upon himself as a geological child of Sir Edgeworth David, and he always spoke of his old chief with the greatest reverence and affection. There is now another geological family, that of W. N. Benson himself, whose members are spread throughout the world. He has left them—and science as a whole—well over a hundred published memoirs, papers and notes recording his researches and his scientific philosophy, written in his own characteristic style. Above all he has left them the memory of himself, which lives on in the ever-widening circle of his geological descendants.

He is survived by his wife, formerly Miss Helen Rawson, who was professor of home science in the University of Otago at the time of their marriage in 1923.

D. S. COOMBS

Dr. Charles Todd, O.B.E., F.R.S.

CHARLES TODD died at Croydon on September 22. He was born in 1869, coming of farming stock in Cumberland. After ill-health as a small boy, he received an education, mainly classical, at Carlisle Grammar School, but succeeded in obtaining an open scholarship in physics and chemistry at Clare College, Cambridge, in 1888. In due course he obtained a Class I in the Natural Science Tripos, proceeding to St. Bartholomew's Hospital with an open scholarship and qualifying in 1894. After several clinical appointments he became interested in public health problems while working at the London Fever Hospital. In 1900 he became assistant bacteriologist to the serum department of the Lister (then Jenner) Institute and worked on antitoxins with George Dean and later G. F. Petrie. Here he demonstrated the existence of a toxin produced by Shiga dysentery bacilli. He went to Egypt in 1904 to help to make antiserum against cattle plague, of which there was a serious outbreak there. This led to an appointment as bacteriologist and afterwards director of the Hygienic Institute in Cairo, and he finally spent twenty-one years in Egypt. In 1906 he was investigating scorpion venom and found out how to make an antiserum. But cattle plague remained a major interest and he made valuable contributions to our knowledge of the disease.

His most important scientific work arose incidentally out of this, for, with R. G. White, he found that cattle repeatedly injected with virulent blood developed isolyms in their sera. The cellular individuality of cattle thus came to light: and Todd and White showed that with suitably absorbed sera the blood cells of any individual could be distinguished from those of any other.

In 1925 Todd left Egypt, having worked on many aspects of public health and received many honours. In 1926 he was given a research grant to work at the National Institute for Medical Research at Hampstead. Here he continued his studies on cellular individuality, now using fowls, in which isohaemagglutinins were readily produced. As with cattle, he found that with absorbed sera he could pick out bloods of individual fowls. He went further and determined that the immunological specificity was inherited: polyvalent sera absorbed with cells of both parents had no action on the cells of their chicks.

At Hampstead Todd worked also on fowl plague and described a 'dilution phenomenon' in which just neutral serum-virus mixtures had their activity restored by dilution. With Perdrau he made studies of the photodynamic action of methylene blue on bacteriophage and other viruses. He finally retired in 1940.

Todd was a delightful and helpful colleague with a great zest for life and a wonderful sense of fun. He had a wide knowledge of public health and microbiology and knew not a little about physics. He delighted in 'Heath-Robinson' gadgets, had a very critical mind and scorn for pretentiousness. He was elected Fellow of the Royal Society in 1930. He was unmarried.

C. H. ANDREWES

Dr. R. O. Page

WITH the death of Robin O. Page, which occurred on July 14 in Christchurch, New Zealand, the science of leather chemistry has suffered a heavy loss. Robin Page was born in 1897 at Christchurch, New Zealand, which was to become his residence for the rest of his life. During his college years he distinguished himself as a scholar and in various sports; he even represented his country in athletics. After receiving the master's degree with first-class honours in chemistry at University College, Canterbury, in 1920, he joined the staff of Woolston Tanneries, Ltd., Christchurch, as a chemist. He was appointed works manager in 1924—a position which he held up to his death.

At an early age he was fascinated by the intricate problems of the mechanism of tanning reactions; an interest which followed him all through his active life. To his inquiring mind the fundamentals and theoretical concepts were vital exigencies. In addition to carrying responsibility in the industry, Page not only kept himself informed about current scientific progress but also contributed a distinguished series of more than twenty original papers—the result of the research which he carried out alongside his practical duties for the love of the great unknown of his 'bread and butter' reactions.

Page was one of the first investigators to realize the importance of the physico-chemical approach in the elucidation of tanning processes, being inspired by the new ideas of the early 'twenties, propounded by Jacques Loeb and John Arthur Wilson, on the behaviour of proteins. This is shown by his lucid papers on ion effects on collagen published in 1927. The subsequent main contributions of Page concern the mechanism of the vegetable tannage. With his sound conception, thorough knowledge of chemistry and critical outlook, the tannery experience became to him a solid background for these pioneering investigations. Among his more recent publications, his clarifying investigation of the classical tannin-