

degree of accuracy. The problem, however, is complex, and many other factors in addition to the main carbon-oxygen and carbon-steam reactions must be considered. The coke supplied to the generator invariably contains moisture, hydrogen, sulphur, nitrogen, and ash, and these constituents take part in a number of reactions which cannot be neglected. The amount of water

vapour in the air supplied to the generator also has an important effect on the heat account. Separate thermal accounts for the "blow" and "run" periods would undoubtedly be of value, but further study of the subject is required before these can be constructed with sufficient accuracy to enable trustworthy conclusions to be drawn.

A. PARKER.

Obituary.

PROF. AXEL WIRÉN.

THE death of Prof. Axel Wirén of Upsala has deprived zoology of an able original worker and a distinguished teacher in the University of Upsala. Born on July 12, 1860, in Eskilstuna on the western or landward side of the province of Sodermanland, about 50 miles west of Stockholm, and the eastern border of which (province) reached the sea, Wirén received his early education at the school of Norrköping, in which his matriculation examination also took place, and he afterwards entered the University of Upsala, where he graduated as Ph.D. in 1885, his thesis being on the circulatory and digestive organs of certain families of polychæts.

From the first the young graduate was attracted to marine zoology and at a time when several departments were sorely in need of scientific advancement. He set himself to work up the zoology of Upsala, especially the chætopods, and by and by he published a series of important researches in the Kongl. Svensk. Vetensk.-Akad. Handl., all finely illustrated by his artistic pencil, the plates varying in number from 5 to 10 (4to) in each communication. The accuracy and beauty of these plates and the value of the accompanying researches would alone have given him a solid reputation. They dealt chiefly with the circulatory and digestive organs of the polychæts, though the minute anatomy of the solenogastres was also worked out with conspicuous ability. Amongst his interesting novelties was the discovery of *Hæmatocleptis terebellidis*, a parasitic eunicid living in the wall of the chitinous stomach of *Terebellides Stræmi*—just as Spengel had found another polychæt, *Oligognathus Bonellia*, in the coelom of *Bonellia*. Besides other papers he published one on *Nereilepas fucata* in its atokous and its epitokous forms, and the changes in its body-wall, as well as a work on the elements of zoology, a useful treatise for his students. He also gave an account of a visit he made to the museums and zoological institutes of Germany in 1891.

Besides his own strenuous labours in upholding zoology at Upsala—mindful of his responsibilities—Wirén encouraged the young graduates and others to carry on original work in his department, and exerted himself in founding the zoological institute of the University from which many important memoirs were issued. These were published in the series of the "Zoologiska Bidrag från Uppsala" (large 8vo), edited by Prof. Wirén. The perusal of these fine memoirs (the expense of which was partly defrayed by the generosity of the late consul, R. Bünsow) raises a feeling of regret that, in a great country like Britain, zoological institutes on the sea beach should be closed for lack of men, interest, and money, instead of continuing the fascinating researches in marine zoology

and botany—not to allude to the importance of these in connexion with the fisheries.

Prof. Wirén was elected to the chair of comparative anatomy at Upsala in 1893, after holding various minor posts. He became professor of zoology and Director of the Zoological Institute in 1908, and held these offices until his death on January 22 last. He worthily served his country and science.

W. C. McINTOSH.

MR. W. H. FINLAY.

A CORRESPONDENT at Cape Town sends us some particulars of the life and work of Mr. William Henry Finlay, formerly chief assistant in the Royal Observatory, Cape Town, who died there on December 7, 1924. Mr. Finlay was born at Liverpool on June 17, 1849, and educated at Liverpool College School. He proceeded to Trinity College, Cambridge, graduating 33rd Wrangler in 1873. In the same year he was appointed first assistant at the Cape Observatory, when Mr. Stone, who succeeded Sir Thomas Maclear, was H.M. Astronomer. Mr. Stone's directorate is chiefly remarkable for the enormous amount of arrear reductions of transit observations which he accomplished, and for his well-known 1880 Cape Catalogue of Stars. In all this work Mr. Finlay took his full share.

As an observer, Mr. Finlay was very zealous in the observation of comets and occultations of stars. He independently discovered the great comet of 1882, and also one, which bears his name, in 1886, and undertook the difficult task of computing its elements as well as of many another. Perhaps in astronomical circles he will be best remembered by his excellent Star Correction Tables, which exemplify the clear grasp he had of his subject, and the orderly practical habit of his mathematical mind.

In addition to his purely astronomical work, Mr. Finlay took an active part in the geodetic work which Sir David Gill, who succeeded Mr. Stone, undertook during his famous directorate. He took the principal share in the longitude operations for connecting Aden with Cape Town, and on his voyages to and from Aden he took advantage of the short stoppages of the steamer at Delagoa Bay, Quilimane, Mozambique, and Zanzibar to determine local time at these places with portable instruments, and to exchange time signals with Cape Town. These observations and the resulting longitudes were published in the Monthly Notices of the Royal Astronomical Society.

In 1887 Mr. Finlay undertook the discussion of the tidal records of Table Bay and Algoa Bay, and the result of his analysis, which is published in the Journal of the South African Philosophical Society, is still the

basis for all tidal predictions at those ports. In addition to these activities, he became the general secretary of the Society from 1881 to 1887, in which year he was elected president. He was also a member of the Cape Meteorological Commission.

When the staff of the Royal Observatory was reorganised in 1897, Mr. Finlay was appointed the chief assistant, but owing to ill-health he was obliged to retire on pension the following year. He spent several years in England, where he completely regained his health, and upon his return to South Africa he took up the work of teaching, a task for which he was eminently suited. When Prof. Williams, of the Rhodes University, Grahamstown, left South Africa to take part in the War, Mr. Finlay took his place as professor of mathematics and surveying, and he remained there at work after Prof. Williams had returned, to within a few days of his death.

LÉON MAQUENNE.

LÉON MAQUENNE, whose death is announced, was born in 1853, and will be remembered as one of those able experimenters and clear-sighted research workers who made notable discoveries in the domain of organic chemistry when the science was still in its infancy and before any really definite views as to the structure of carbon compounds, especially those of natural origin, had been developed. His most noteworthy contributions deal with the structure of the sugar alcohols, important naturally occurring substances which, for many years, resisted the attack of the chemists of his time, and his first achievement in this field was the determination of the constitution of inositol, a compound which occurs widely in both the animal and vegetable kingdoms. He was able to show that this sugar alcohol was hexahydroxycyclohexane, and thus not only established the structure of the first member of an important new series, but also indicated the close relationship which exists between substances produced in the organism and benzene.

Maquenne was also successful in determining the constitution of perseitol, a seven carbon sugar alcohol which occurs in the leaves of *Laurus Persea*, but his most outstanding work in this connexion was probably the isolation of the dextro form of erythritol by the reduction of *l*-threose, a discovery which was shortly afterwards supplemented by the preparation of *d*-erythritol by his pupil Gabriel Bertrand, who isolated it by the action of the "sorbose bacterium" (*bacterium xylinum*) on natural erythritol. The two enantiomorphs were then united to form the *racemic* modification which was found to be identical with the compound which Griner had synthesised in 1893 from divinyl. The natural form of erythritol is the *meso* modification, but both the *meso* and *racemic* stereoisomers were prepared by Griner in his synthesis.

Of special importance also is the work carried out by Maquenne on starch, which is embodied in a series of papers published during 1904 and 1905. One outcome of this investigation was the discovery, made with Eugene Roux, that crude starch is a mixture of amylose and amylopectine.

During recent years Maquenne turned his attention more particularly to biochemical problems, and he was able to elaborate many important and delicate methods

of analysis. His great range of knowledge led him, however, to carry out researches over a wide field, and to him, amongst other things, is due the preparation of pure acetylene from barium carbide, as well as the method of eliminating nitrogen from the air by means of metallic magnesium, which was ultimately used by Rayleigh and Ramsay in the preparation of argon.

ALL who are concerned in the world of shipping and in the electrical industry will learn with regret of the death on March 17, a few hours before his forty-sixth birthday, of Mr. W. W. Bradfield, general manager of the Marconi International Marine Communication Co., Ltd. Practical radio telegraphy, particularly in connexion with shipping, owes much to Mr. Bradfield, whose connexion with the Marconi Company dates from September 3, 1897, when he entered what was then known as the Wireless Telegraph and Signal Company, Ltd. As electrical assistant to Senatore Marconi, in the earliest days of commercial wireless, Mr. Bradfield took part in experimental work on Salisbury Plain, and assisted in the erection of the wireless station at the Needles, Isle of Wight. In the year 1899 he installed the first wireless apparatus on British battleships, and a little later took charge of the demonstrations to the United States Government on board the U.S. battleship *Massachusetts*, while in 1901 he undertook similar demonstrations before the French Government, when communication was established between the French Riviera and Corsica. In the same year he supervised the erection of the famous stations at Siasconset (Nantucket Island) and the Nantucket Lightship. From 1902 until 1908 Mr. Bradfield was chief engineer to the Marconi Wireless Telegraph Company of America, and during this time he took part in the first International Radio-Telegraphic Conference, held in Berlin in 1906.

SIR WILLIAM PECK had occupied the post of City Astronomer of Edinburgh, in charge of the Calton Hill Observatory, since 1889, when the erection of the new Royal Observatory on Blackford Hill set the older building, with most of its instruments, at liberty. He was of an active and inventive mind, and interested in all mechanical pursuits, besides astronomy. He constructed many of his own instruments. He was, in addition, a popular lecturer of considerable power and attraction, and was the author of a popular "Handbook and Atlas of Astronomy" and other works. The City Observatory was devoted chiefly to showing the heavens to visitors—a service much appreciated by the citizens. For this purpose a six-inch photovisual telescope, presented to the observatory, was of good service. In pursuance of the science, Sir William Peck visited Spain for the eclipse of 1905, and Egypt in 1908. He received the honour of knighthood in 1917. He died on March 7, after a long illness, aged sixty-three years.

WE regret to announce the following deaths:

Prof. A. Dendy, F.R.S., professor of zoology in the University of London (King's College), on March 24, aged fifty-nine.

Mr. H. E. Jones, president in 1917 of the Institution of Civil Engineers, on March 24, aged eighty-two.