

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 cœlom 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