BIRDS OF SURINAM

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By F. Haverschmidt. Illustrated by Paul Barruel. Pp. xxix + 445 + 70 plates. (Oliver and Boyd: Edinburgh and London, 1968.) 252*s*.

THE author of this sumptuous volume is a well known ornithologist who has now retired to the Netherlands from the post of Chief Justice in Surinam. Here he summarizes what he has learnt about the birds of that little-worked country during more than twenty years of service. His account is based largely on first-hand knowledge, and in drawing on such other sources as there are he has on principle refrained from using extralimital information about the included species (except for terse indications of total range).

Only a few parts of South America, richest continent of all in its birdlife, are as yet covered by comprehensive and up to date ornithological publications. There was thus a need for this book, although the present state of knowledge leaves many gaps to be filled. According to the author, there are at least 100 species that one would expect to find in Surinam but that have not yet been recorded there; and of the 542 species already known, other than as migratory visitors, breeding data are so far only available for 234. Even on these aspects alone there is therefore much to be done by future observers, for whom an invaluable baseline is here provided.

No native species is known to desert Surinam for any part of the year, but local wanderings are common and there are occasional irregular movements. In addition, 60 species of migrants are visitors to the country, mostly from the north and predominantly waders; a very few are visitors from the south, subspecifically distinct from the resident birds.

The book opens with very brief general sections on topography, climate, ornithological history, breeding, migration, future research and conservation. The subsequent treatment of each species is under the heads, as far as applicable, of identification, habitat and habits, nesting, recorded food and range. The author has collected about 8,700 skins (537 species), now mostly in Leiden Museum, and his identification particulars include the colours of the "soft parts", length of wing and body weight.

Most of the species are finely illustrated either in colour or in line. There are photographs of typical habitats and of some nests and nestlings; there is also a map.

LANDSBOROUGH THOMSON

OBITUARIES

Professor Otto Hahn

THE death of Professor Hahn on July 28 has removed the doyen from the circle of classical radiochemists. Hahn was born in Frankfurt in March 1879; at secondary school he was already attracted to chemical science. He studied in Marburg, was awarded a PhD for his thesis on bromoeugenol and became an assistant to Professor Zincke with the duty to prepare demonstrations for the professor's lectures. During this period he was offered a post in a chemical firm, Kalle and Co., provided he spent some time first in England to learn the language. Professor Zincke wrote to Sir William Ramsey, and Hahn was given laboratory space in the Chemistry Department of University College, London. Sir William suggested to the visitor he extract the radium contained in a sample of barium bromide by fractional crystallization. Hahn soon noticed that the decay curve of the emanation showed a contribution of the short living thoron. He was able to extract the thorium contamination which was responsible for the thoron. As the discoverer of this new nucleide he was entitled to name it: radiothorium.

Hahn was keen to learn more in this new field; Rutherford's laboratory in Montreal was the place to do so. On the basis of his discovery of radiothorium Rutherford accepted him. In the autumn of 1905 with his Rd-Th and a specimen containing actinium, both presents from Sir William, he went to Montreal. During the nine month period there he discovered radioactinium and ThC′. During the summer of 1906 Hahn returned to Germany under Professor Emil Fischer (the famous organic chemist and director of the University Chemical Laboratory of the University of Berlin), who accommodated him in the institute's carpenter shop (1906–12). There Hahn found mesothorium, estimated its half-life and just missed the discovery of the parent of radium, ionium, which was found by Boltwood in the United States.

In 1907 a young lady physicist, Liese Meitner, joined the group provisionally for a period of two years which, however, was extended to thirty years. One of their investigations (with O. V. Bayer) concerned the energy distribution of electrons emitted in beta decay. They used a simple magnetic spectrometer and discovered distinct lines; later studies showed that the lines were due to internal conversion and not to disintegration electrons.

In 1912 the Kaiser-William Institute for chemistry was built with a small independent department for Hahn. In this non-contaminated laboratory very weak activities such as the beta rays from K and Rb could be examined. From the decay constant of Rb and the Sr assay of a sample of Rb mica he was able to calculate the age of the mineral (see Hahn: "Was lehrt uns die Radioaktivität über die Geschichte de Erde").

The still uncertain origin of actinium was attacked by extracting from pitchblende a fraction following tantalum as carrier which was found to produce actinium emanation on decay. Hahn and Meitner named it protactinium. Under the supervision of Hahn the Radiumfabrik in Joachimstal was able to extract 0·5 g of Pa from five tons of pitchblende residue.

In 1921 Hahn made the remarkable discovery of uranium Z which has the same mass and charge as UX_2 but different radiative properties. Historically, this is the first case of nuclear isomerism. Only after the discovery of artificial radioactivity in 1939 were new cases of isomerism found; they are of considerable importance for the knowledge of nuclear structure.

Nothing has been said of the many methods developed by Hahn and his collaborators to use radioactivity as a tool to solve many chemical and physical problems. His book *Applied Radioactivity* contains much information of this kind.

A most exciting and exasperating period started for Hahn when Fermi and his collaborators published results on the irradiation of uranium with slow neutrons. The latter were known to be the most effective agents to induce radioactivity in almost any nucleus. In contrast the case of uranium was most complex: many different activities were observed in bodies with widely varying chemical properties: roughly they behaved as alkalis, alkaline earths, rare earths, heavy metals or rare gases. Those which followed barium when Ba was used as carrier in precipitation were labelled Eka barium where the Eka referred to the next higher period of the periodic system (not actually known). The formation of the series resembling noble metals was understandable as it was believed at the time that the sequence of elements following uranium would have metallic properties. The existence of radioactive chains was experimentally established; for example: $U + n \rightarrow$ Eka Re $\xrightarrow{\beta}$ Eka Os $\xrightarrow{\beta}$ Eka Ir $\xrightarrow{\beta}$ Eka Pt $\xrightarrow{\beta}$ Eka Au. Such a process would involve a stepwise increase of the nuclear charge from 92 for U to 97 for Eka Au. Because similar parallel chains involving