

The final chapters deal with recording and field equipment, and glance at the ancillary techniques of weighing, measuring and parasite collection. A full list of the British bird observatories makes an important appendix. The authors exclude, however, any detailed references to ringing outside the British Isles on the grounds that the literature received was "far too voluminous"; but a list of the more important schemes would have been welcomed and could have replaced the four pages devoted to a "Model Life-Study by the Ringing Method". Some of the works mentioned in the text by abbreviated titles are not recognizable in the "Select Bibliography", which includes remarkably few titles directly relevant to ringing methods and thus at least shows the need for this well-produced little handbook.

BRUCE CAMPBELL

## WEST AFRICAN "BEEF"

### The Overloaded Ark

By Gerald M. Durrell. Pp. 238. (London: Faber and Faber, Ltd., 1953.) 15s. net.

THIS is an account of a collecting trip to West Africa by two naturalists who were determined to go to the tropics and enjoy the wild life of them, but who could raise the necessary money only by undertaking to collect wild animals for European zoos. They came back poorer financially than they left; but they did manage to cover the greater part of their expenses, and they were enormously enriched by their experiences. Gerald Durrell and his companion, John Yealland, are excellent naturalists, and the first, who, against the advice of the second, has written this book, has the flair for writing that runs in the family and has produced a most entertaining volume.

The steaming forests of the Cameroons teem with animal life if only you can find it; but the human collector toiling painfully on foot through the tangled undergrowth is at a great disadvantage compared with the animals that can creep under the obstructions, swing from tree to tree over him, or soar into the air above everything. By enlisting the help of the natives who have been born and bred in the forest it is, however, possible to come up with the wild creatures and to capture specimens of "beef", as the wild animals of the region are called in the local pidgin.

The author and his companion were able to get together a good collection of birds and animals—perhaps the most interesting of them all were the angwantibo and the otter shrew. The angwantibo, *Arctocebus calabarensis*, is a very rare lemurid found only in the forests of the British and French Cameroons; there are very few specimens in museums, and it had never been brought alive to Europe. Scarcely a single zoologist had ever seen it alive, and practically nothing was known of its way of life. After much fruitless searching a native casually brought one in, caged in a basket of palm leaf; it placidly accepted captivity and was successfully brought to the London Zoo. *Arctocebus* much resembles the potto; it is nocturnal, spending the day asleep clinging to a branch with its head tucked down between its arms, becoming active at night and feeding upon fruit, insects and meat. Durrell was also fortunate enough to obtain two otter shrews, or giant water shrews (*Potamogale*); but after they

had apparently settled down comfortably in captivity they both inexplicably died. The account of the finding and capture of the first in the middle of the night under a rock in a mountain torrent is a splendid bit of descriptive writing, as indeed are many other passages in the book. The natural diet of the otter shrew appears to be freshwater crabs, for of all the food-stuffs offered they were the only things eaten. The author was able to wean them on to an artificial diet which seemed to suit them well until their sudden deaths showed that something was lacking. Such are the delights and disappointments of the animal collector.

This is an excellent travel book that really gives the reader the feel of the tropical forests of West Africa; it is vivid but objective, and avoids purple passages—it will fill naturalists with envy of those whose enterprise took them on such a fascinating zoological journey. The skilful line drawings by Sabine Baur are an ornament to the work.

L. HARRISON MATTHEWS

## CULTURE OF ALGAE

### Algal Culture

From Laboratory to Pilot Plant. Edited by John S. Burlew. Pp. ix+357. (Publication 600.) (Washington, D.C.: Carnegie Institution of Washington, 1953.) 1.25 dollars.

IT has not often happened that a scientific programme of uncertain outcome, which is only worthwhile if it has practical results, has attracted so much attention, so many fertile brains and even very considerable funds. In biology it has happened for the first time.

The reason is the obvious necessity to supplement our normal field-crops, which cannot be increased much above the present level, with some kind of food of a different origin. The rising number of inhabitants of the earth, due to reduced mortality, puts pressure on our inventive capacities, and one hopes to find a way out with the help of algal cultures.

Conforming with the general tendency of our time to plan ahead, means and energy are being directed towards growing algae on a gigantic scale which, twenty years ago, would have appeared ridiculous to propose. Compared with the food value of the algae hoped for, the transformation of radiant energy plays a minor part in the discussions.

At present the solar energy reaching the earth is, to a large extent, wasted. No better means for utilizing it is known than the pigment system of green plants, and it seems more reasonable to use the algae produced, if sufficient quantities are forthcoming, as a food for man and animals than to burn them in boilers. The notion of growing algae as food was conceived in Germany by O. Warburg during the First World War, but did not begin to stimulate action until the Second World War, and then mainly in the United States, while minor efforts are reported from Great Britain, the Netherlands, Israel, Germany and Japan.

The main aim is to attain optimum utilization of radiant energy from the sun; the main difficulty being the protection against infection with other, for example predatory, organisms. A closed, though not necessarily sterile, apparatus of enormous dimensions is required. One hopes to produce a larger amount of