

seems unnecessarily elementary, and some of the instruments described are surely obsolete.

The rest of the book is very useful indeed. Separate chapters (several for nitrogen and phosphorus) give methods for determination of chlorinity, pH, nitrogen, phosphorus, silicon, carbon, oxygen, alkalinity (an account of the carbon dioxide system is interpolated), conservative elements by micro methods, trace metals and plankton pigments. Others describe filtration methods, and sediment analysis. In each chapter, introductory notes explain the application and chemistry of the methods, which are then given tersely in a form easy to follow at the bench. Remarks on matters of technique, interference, and accuracy come last. The methods are well chosen and it is evident that Dr. Barnes is drawing on considerable experience. It is a little surprising that he does not mention the determination of pH with indicators, as it is easy to get quite good results with very simple gear. He should be well able to explain and set out the corrections needed for this method, which is still in use.

There are more than 420 references, some 60 of which are in an appendix bringing them up to July 1958. These are invaluable, although there are few from Russian sources. The 45 tables are mostly relevant; but it is not easy to see the need for reciprocals of atomic weights, nor for a complete list of the symbols recommended by the Chemical Society. The index is thorough. The binding and paper seem rather too absorbent for a book which is certain to be used a great deal on the laboratory bench.

F. A. J. ARMSTRONG

## ATLANTIC HYDROMEDUSAE

The Carlsberg Foundation's Oceanographical Expedition round the World 1928-30 and Previous "Dana" Expeditions

"Dana" Report No. 46: The Hydromedusae of the Atlantic Ocean and Adjacent Waters. By P. L. Kramp. Pp. 283+2 plates. (Copenhagen: Andr. Fred. Høst and Son, 1959.) 60 Danish kr.

THIS work, by one of the world's most knowledgeable experts on the subject, is a valuable addition to the excellent series of *Dana* Reports. It will partly replace and partly help to guide us to the multitudinous works on medusae in so many scattered journals, although it has not a complete literature list.

One might wonder how far this new volume overlaps Russell's monograph on the "Medusae of the British Isles" published in 1953 and if it is necessary or desirable for both to be at hand. That there is considerable overlap is inevitable and as it should be, but the two serve distinct purposes. Russell is confined to British waters—but not as defined by the Convention!—and it has much more detailed descriptions with details of the hydroids and their development where these are known. Kramp covers a much wider field. An example which illustrates this difference is given by the genus *Phialidium*. Russell describes two species but Kramp twelve and four doubtful ones. Kramp's description of *P. hemisphaericum* is contained in ten lines, and Russell's in ten pages.

This new report is in three sections. The first occupies 74 pages and is a systematic account of the species taken on the *Dana* cruise, 1928-30, and in collections made at the request of the *Dana* Committee. Not

only are very full taxonomic descriptions given, often clearing up doubtful nomenclature, but also brief but useful summaries of distribution, both geographically and in depth. It contains descriptions of three new species and one new subspecies.

The second section, of more than a hundred pages, is a survey of all the hydromedusae which have up to now been found in the Atlantic and adjacent waters, a term interpreted to include the Caribbean, Davis Strait and Baffin Bay, the Mediterranean, Black Sea and the waters north of European U.S.S.R.: truly a wonderful coverage. This section will be a boon to those struggling with the systematics of medusae as it has a diagnosis of every family, genus and species, and with keys to all species at present considered valid. It makes extensive use of Russell's book and his Plankton Sheets for those species that are given therein, but its wider field will make it a most valuable aid towards the determination of medusae by workers everywhere. The descriptions are concise and their arrangement helps to make them simple to follow. The keys, too, are clear, and if only the medusae themselves were always as clear their determination would be much easier. It is scarcely the author's fault that medusae are so often damaged that in practice the answer to some of the questions may be just a question mark. Because of the changes during development the section is confined to the adult forms. This is a pity because so often the young stages found in the plankton can be puzzling. I was disappointed to see that Kramp had not done more to link the medusae with their hydroids as there is now a great deal of information on this, but he probably considered it to be outside the particular relevance of the book. Doubtful species are mentioned in case future research should point to their validity. In this section, too, their distribution is concisely mentioned.

The third section is for the ecologist and it describes the composition of the fauna of the hydromedusae within each of the zoogeographical regions of the area—the Black Sea excluded—and based on the distribution of the water masses. The number of regions is generous in its coverage, with details separately given for four ecological groups—neritic, slope, oceanic epipelagic and bathypelagic—each being regionally subdivided. The neritic group is given extensive subdivision, first into eight major regions, for example, Arctic, East Atlantic Boreal, etc., and then into provinces, for example, Atlantic coasts of the British Isles, Channel, North Sea, Baltic, Norway north of Bergen, Iceland. Russell, in 1935, laid stress on the value of certain medusae as 'indicator species', and the detail given in this section of Kramp's book will be invaluable in this respect. It is only to be expected that further research will widen our knowledge of the distribution of many of the medusae, and although it is obvious that Kramp realizes this (for example, at the bottom of p. 266), I found some of his statements too dogmatic, and once in error. On page 210 he says that *Ptychogena lactea* is "entirely lacking in the East-Atlantic boreal region". The *Scotia* took this species in the Faroe Channel in June 1958, and indeed Kramp himself confirmed the identification.

Like other *Dana* Reports, the proof-reading and production have been excellent. Those interested in the systematics of medusae or in the ecology of the water masses will certainly want to have this volume, and I have no doubt that their copy will before long be well thumbed.

J. H. FRASER