
Review

Author(s): J. Stanley Gardiner

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OCEANOGRAPHY.

IN INDIAN SEAS.

A Naturalist in Indian Seas. By A. Alcock, M.B., F.R.S. London: Murray. 1902.

In this book we have a most fascinating and complete popular account of the deep-sea fauna of the Indian seas. The book is one of intense interest throughout to the zoologist, but at the same time its matter is arranged in such a form that no special knowledge is required from its readers. The natural history of the forms is dealt with in a broad spirit, and the author has not hesitated to indicate how the structure of the various animals is, in his opinion, especially adapted to their physical environments. Scientific accuracy has been everywhere retained, while the matter is fully explained both in the text and by a most admirable series of illustrations.

On the geographical side brief indications are given of many considerations of the greatest importance, which the author, to our regret, has, in spite of his great experience, not pursued. Foremost among these is the question of the connection of the Indian and Atlantic oceans in the Tertiary period, in reference to which many instances are given of animals common to both seas. The author, indeed, gives internal evidence that he has considered this question deeply, but, failing to see the great general interest of the subject, has not cared to treat the question in a book which professedly deals with natural history alone.

The Indian seas are divided into three parts: the Laccadive sea, the Bay of Bengal, and the Andaman sea. Of these, the first two are open to the ocean to the south, and hence, in their fauna, are of no particular interest. Their bottom temperatures gradually decrease down to 35° Fahr. at about 1800 fathoms, but the greater part of the Laccadive sea lies within the 1200-fathom line. The Andaman sea, on the other hand, is an enclosed sea, attaining a depth of upwards of 1700 fathoms, and a temperature of about 41° Fahr. at 800 fathoms, below which there is practically no further decrease. There would, then, seem to be of necessity a ridge of less than 800 fathoms in depth, preventing a free circulation of water between the greater depths of the ocean and the Andaman sea. This is shown to be the case by soundings of 736 fathoms between the Andaman and Nicobar islands, and of 760 between the latter and Sumatra, while the Malacca strait does not attain a greater depth than 100 fathoms. The Andaman sea, then, would seem to be the most northern of that series of deep and enclosed basins which separate the East Indies into two lines, and of which the Bali-Flores and Banda seas have lately been shown by the Siboga Expedition to be examples.

A good picture is given, in the course of the work, of the bottom of the Bay of Bengal, but the deposits are very lightly treated of. The presence of a continuous bed of "greensand" within and between the Laccadive islands from about 700 to 1100 fathoms is not without interest. The land deposits extend out from 60 to 300 miles from the Indian coasts, and 100 miles to the west of Middle Andaman island, fragments of rude earthen pottery and numerous decomposing leaves were dredged from 1644 fathoms. The richest ground for the zoologist was found between 200 and 1000 fathoms, not too far from the shore; but the whole work of the *Investigator*, the survey ship of the Indian Marine, indicates enormous economic possibilities for well-equipped steam-trawlers operating down to the lesser depth.

Among the more isolated islands, Dr. Alcock landed on and has a few remarks to make about the Cocos, South Sentinel (a coral reef raised a few feet above high-water mark), and some of the Laccadives. All the latter are considered to be the remains of eroded atolls; but the author's meaning is not clear, and he has evidently not considered the submerged banks of the group. Considerable banks of pumice

are not uncommon features of the islands of the Maldive group and Pacific Ocean, as well as of the Laccadives. Minikoi is scarcely the paradise which it has been depicted, though the people always put their best side foremost. The land is equally divided between the government and the people. The latter's half has eroded away so rapidly that it is probably not the third of its former size, while the government portion has grown. The former part is completely tilled, while the "crown lands" are absolutely uncultivated and going to waste. The young men are sent away to provide the rice which is necessary for their families' maintenance. Considering the available land, the population is denser than that of any part of India. And, finally, the state of continual anxiety in which the people of Minikoi live is far more fatal to them than the storm-waves that once in a century decimate the population.

J. STANLEY GARDINER.

CARTOGRAPHY.

MAP PROJECTIONS.

'Maps: their Uses and Construction. A short popular treatise on the advantages and defects of maps on various projections, followed by an outline of the principles involved in their construction.' By G. James Morrison, M.I.C.E., F.R.G.S. Second Edition, revised and enlarged. London: E. Stanford. 1902.

The first edition of Mr. Morrison's little work on map projections was reviewed in the *Geographical Journal* for November, 1901, and it is satisfactory to find that, in accordance with suggestions there made, a great deal has been done in this second edition towards rendering it more generally useful and complete.

The first chapter remains much as it was before. The second has been revised, and a description of an elliptical projection (Mollweide's) added. The third chapter has been considerably enlarged and rearranged, among the important improvements being more complete descriptions of the Stereographic and Mercator's projections. The account of the conical projection has also been expanded. Chapter iv., dealing with projections of small areas, has been entirely re-written. By the introduction of various tables, Mr. Morrison has further improved his work, although some of these, such as that of meridional parts, are somewhat too short and incomplete to be of great practical value. This second edition is a decided advance upon the first, and in its present form the work constitutes a useful little introductory handbook to the subject of map projections. The author does not pretend that it is more than this, and those who desire to go more fully into the matter should consult the writings of Germain, Clarke and others.

MAP-DRAWING.

'Memory Map-drawing.' By a Professional Teacher. (R. G. Scanlan, Pialha State School, Queensland.) Halifax: Blatchford Brothers. 1902. Pp. 28.

The suggested memory-aids in the form of guide-lines and pictures may be of use to some teachers who may not have the time to evolve a system of the kind for themselves. A more valuable feature is the attention given to the projection of maps, which is entirely neglected by too many teachers, but which, with the aid of the tables supplied by the author, is quite within the reach of intelligent children. Memory map-drawing is no doubt valuable as supplying a basis of topographical knowledge on which to build further study, but care is necessary lest too much attention be given to it at the expense of other branches of geographical teaching.