

BOOK REVIEWS

RECENT GEOSCIENTIFIC STUDIES IN THE ARABIAN SEA OFF INDIA.
Special Publication No. 24, Geological Survey of India, Calcutta, 1989, 375 pp.
Rs. 185, £ 22, \$ 67.

It is gratifying to note that during recent years the Geological Survey of India has been regularly bringing out some publication or the other dealing with a theme, or a region or a collection of miscellaneous papers, slowly trying to reduce the gap between the period of study and its publication to the extent possible, given its constraints. The publication under review is an outcome of a Seminar held at Mangalore, Karnataka, during September 23-25, 1987 on 'Recent Geoscientific Studies in the Arabian Sea off India.'

About 44 papers have been included in this volume (serially numbered under various sub-headings) and except for one (44th, dealing with a few features in the East Pacific Rise), most of the others (about 39) deal with studies on and off the West Coast of India.

There are some papers on specific geographical areas along and off the coast. Some add to the wealth of data already available on the morphology, sediments (particularly granulometry), heavy minerals, geochemistry and microfauna. In some of the papers one finds interesting data and conclusions, definitely welcome contributions to our knowledge and concepts.

It is shown that in some places continental crust extends into deep sea segments as well (1). Some of the textural attributes seem to help in distinguishing the sediments of the beach from those in the lagoon (2). A number of papers give detailed maps on distribution of sand, silt, clay and combinations in them, offshore (3, 4, 5, 6). An attempt has been made to correlate lithofacies with strandlines (6).

Marine micropalaeontologists in India, in the earlier years, had to be content with studying the samples made available by the Westerners and more often corroborated the results published earlier. If they were lucky, they used to report new species. But fortunately, since over a decade, with the Geological Survey of India and the National Institute of Oceanography having their own vessels and conducting cruises, it has become possible for the marine micropalaeontologists to study samples collected from different zones in the offshore sediments. Determination of stage boundary is made possible by the abundance of certain species beneath certain depths (7) and physical environment is interpreted based on abundance of certain species between 100 and 600 metres (8). It is contended that the sudden increase in the amount of certain fauna at lower depths *now*, which normally live at greater depths, is possibly indicative of higher sea levels (10). Anomalous occurrences of certain species of foraminifera generally relegated to certain specific climates (like tropical, subtropical, subpolar, polar) in altogether different environment leads one to infer shift in palaeoclimatic belts (13)

Isomagnetic contour map (p. 140) very clearly brings out two distinct domains indicative of Narmada graben in the north and Dharwar structural domain in the south, off the West Coast (14) with the boundary, however, running approximately

along 19°N Latitude. It is interesting to note distinct differences in the chemical nature of the sediments in offshore areas, in some cases, where the inner shelf sediments are characterised by very low calcium carbonate content and high silica value, while in the outer shelf the reverse is the case (17).

Possible future areas for hydrocarbon exploration are indicated based on a clear analysis of existing data on the tectonics of the continental shelf and slope off West Coast of India (20). Though the occurrence is rare and detection is always not easy, it is pointed out that mercury anomalies in the offshore area may be related to hot springs or emanations from deep sources (21). Though it is good to know that placer gold has been detected in offshore samples, west of Calicut, that it is not economically workable is a realistic inference (28). It is a good augury that Port authorities are increasingly seeking the advice of geologists when they plan any construction offshore. This necessitates detailed study of the morphology, sediments and/or processes operating (29, 31, 32, 34). These definitely will aid in the adoption of appropriate measures during construction of underwater structures.

How much one owes to seismic stratigraphy in order to attempt the study of tectonics of offshore sediments is well brought out (36; plates I to IV, pp. 317-318) though there can always be a certain amount of marginal differences in the interpretation of the same by different geoscientists, depending upon their basic training, experience, adherence to certain schools of thought and appreciation of emerging concepts. Convincing examples of neotectonism based on the position of certain laterite patches, offsets of stream courses, truncation of beach ridges etc., in Kerala are given (38) and a laudable attempt has been made to trace the evolutionary history of the Arabian Sea-floor from Late Cretaceous to Recent.

By and large, errors and shortcomings seem to be very few. However, some of them are cited here. Incomplete references on page 49, and poor drafting of the boundaries of the Red Sea (p. 74) and Mozambique (p. 134) are conspicuous. The N. Latitude at the bottom of Fig. 2 (p. 91) should be 09°42', the number of depth contours and their values in Fig. 1 (p. 144) are at variance, and it is WSW-ESE and not WSW-ESE on page 328. Whereas paper 23 deals in considerable detail on the results of investigation for heavy mineral sands off Paravur-Varkala area in Kerala, it would have been worthwhile to know how the estimates arrived at here compares with those obtained earlier as a result of extensive investigations conducted by the Department of Atomic Energy during the early sixties, though the total area and depth of investigation may not be identical. It is just not enough to cite a reference (Prabhakar Rao, 1968) in the text, and omit it under Reference (p. 224).

On the whole it is a well got-up publication, reasonably priced and deserves to be perused by all those interested in the study of coastal and offshore areas of the country.