THE INDIAN OCEAN: EXPLOITABLE MINERAL AND PETROLEUM RESOURCES. S. Roonwal, Springer-Verlag, 198 pp., 68 Figs.

In recent years, exploration for economic minerals under the oceans is gaining increasing attention of geologists. With the advancement of oceanography and marine geology, more and more facts are coming to light enriching our knowledge of ocean bottom geology. These branches of science have developed with rapid strides in the last two decades, particularly since the Deep Sea Drilling Projects. The geology of the Indian Ocean and its exploitable mineral resources came to light when extensive studies were carried out during the Indian Ocean Exploration in 1964. The seabed of Indian Ocean contains mineral deposits like beach sands enriched with heavy minerals, phosphorite, ferromanganese nodules, metal-rich sands, sulphide ore deposits and sub-surface petroleum resources. Their occurrence, resourcefulness and exploitation form the theme of this book. Over the years, the concept of Plate Tectonics has become a powerful tool in the hands of the explorationists. Discussion on this aspect, while describing the mode of occurrence and distribution of various minerals and petroleum, is well-justified by the author.

In ten chapters the author has expertly brought out almost all aspects of the geology of the Indian Ocean, its history of evolution, mineral resources and their exploration and exploitation methods. First two chapters are devoted to ocean physiography and origin and development of Indian Ocean. Chapter 3 presents the state-of-the-art of exploration methods of various minerals, from ferromanganese nodules to petroleum. In the next six chapters, occurrence, distribution, and economic potential of different types of minerals including petroleum have been discussed. Minerals are grouped in two main categories : sub-sea surface deposits and sub-sea sub-surface deposits. Under the first category, are included placer deposits, phosphorites, ferromanganese nodules and encrustations, metalliferous sediments and hydrothermal ores. Petroleum and natural gas are discussed under the second category requiring subsurface exploration techniques. In the last chapter, the author describes different types of mining techniques for exploitation of sea bottom surface deposits. With the growing consciousness of environment and maintenance of ecosystem, it is quite topical that this type of book should end up with a discussion on environment. The author also discusses the legal implications of exploitation of economic minerals in international waters. Thus, this book meets all the requirements of the time.

The discussion on ferromanganese nodules and their mining is the strong point of this book. The author has devoted about 48 pages on this aspect with examples from different parts of the world.

In the chapter on petroleum and natural gas, the author has tried to present a short account of the origin, migration and accumulation of oil and gas and their occurrence in shelf, slope, rise and abyssal plains. Resource potentials in different ocean basins have been discussed. This chapter would have been complete if hydrocarbon prospects in different plate margin set-ups had been discussed. The importance of turbidites in hydrocarbon accumulation in deep water environment has not been brought out.

In a book like this, it is not possible to write a detailed discussion on chosen topics for advanced research. However, this book provides basic facts about the

Indian Ocean and its mineral and petroleum resources with adequate illustrations. The author has presented several aspects of the exploitable mineral resources of Indian Ocean and it is, indeed, a welcome contribution. So far, there was no single book available which presented all basic facts on different types of mineral resources including petroleum. The author deserves to be credited for attempting to fulfil this longfelt need. Author's style of writing is commendable. He has touched upon all the important aspects and presented the facts very concisely and precisely. The book, therefore, serves its purpose as a handy reference work for students as well as for mineral economists, planners and policy makers.

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ADVANCES IN GEOPHYSICS. Edited by B. B. Bhattacharya, Oxford IBH Publishing Company Private Limited, 1988.

This is a monograph of eleven papers brought out by the Department of Applied Geophysics of the Indian School of Mines, Dhanbad, to mark the Diamond Jubilee Celebrations of the School in 1986-87. The papers reflecting the main research activities of the Department range widely from in-seam seismics to digital analysis and application of Landsat imagery for augmenting regional geological maps.

There is a case-history of geophysical exploration for groundwater around Dhanbad and other areas in South Bihar. Another paper discusses the gravity field of Eastern India in relation to Singhbhum, Gondwanas of the Damodar Valley, Ranchi-Netarhat plateau, Bihar Mica Belt and Rajmahal Hills. Two papers are devoted to the seismicity of the Indian plate boundary along the Himalayas, Arakanyoma and the Baluchisthan Arc. Other papers cover some interpretation techniques, design and development of MPPO-TEM system, instrumentation and modelling for in-seam seismics, depth of investigation of different electrode arrays and EM anomaly enhancement due to leakage paths between the target conductor and the host rock. The interpretation techniques discussed include the application of a method of inversion to VES measurements, use of Werner's deconvulation for automated interpretation in gravity and magnetics, use of the Hilbert transform for analysing SP anomalies, depth determination to magnetic sources, computation of X, Y and Z components from the total magnetic field through filtered response functions etc.

Although the monograph covers but familiar ground, the effort is laudable. Special credit is due to the Department of Applied Geophysics for initiating the study of in-seam seismic wave propagation that finds increasing application in day-to-day mining of underground coal.

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