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Book Reviews

RIFT ZONES OF THE WORLD OCEAN. Edited by A. P. Vinogradov and G. B. Udintsev. Halsted Press, New York, 1975. 503 pages. $55.00.

Since 1972, a major national program, the Deep Sea Drilling Project (DSDP), has made great advances in our understanding of the oceanic crust and the role of oceanic spreading centers, or rift zones, in the theories of sea-floor spreading and of plate tectonics. Now as an international effort, the International Phase of Ocean Drilling has been inaugurated. Thus far a total of 46 DSDP legs, or cruises, have been completed and tens of thousands of pages have been written on the scientific and technical accomplishments. *Rift Zones of the World Ocean* was, unfortunately, written prior to 1972.

The title of this monograph is somewhat misleading—the papers are reports on three geological–geophysical cruises (Vityaz #36, 1964–65; Vityaz #41, 1967; and Adademik Kurchatov #2, 1967) to study the rift system of the Indian Ocean. Although some attempt is made in each paper to summarize work from other rift zones, this is still a very secondary part of the monograph. Papers on petrology, morphology, and seismology dominate the monograph, but there are shorter papers on gravity, magnetics, heatflow, and ore genesis. Two interesting chronologic accounts of the cruises are included.

The quality of the individual papers varies considerably—the better ones have already appeared in English-language journals. Throughout the monograph one senses a begrudging acceptance of sea-floor spreading. The paper on magnetics interprets the magnetic anomalies parallel to the rift zone as being due to block faulting. Four papers on the petrology and geochemistry of a suite of dredged igneous rocks give very interesting petrographic descriptions and chemical analyses. A convincing case is presented for the bimodality in both chemistry and mineralogy of the recovered ultramafic rocks. The modes reflect therzolites, considered to represent unmelted mantle, and harzburgites, representing the residuum after melting. Good arguments are also made for a model of fresher, less metamorphosed oceanic crust, then some other popular models. Relatively fresh basalt and basaltic glass from DSDP Hole 332B at more than 700 m subbasement depth now support this view.

Any researcher, or research institution, who can afford the DSDP Initial Reports volumes should also have this one, but it is not a much-needed, up-to-date review of ocean spreading centers. Rather, it is a relatively specific account of several geological–geophysical cruises in the mid-1960's to survey the Indian Ocean spreading centers.

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