

REVIEW

Island Arcs: Japan and Its Environs; by ARATA SUGIMURA and SEIYA UYEDA. P. 247, 134 figs. Amsterdam, 1973 (Elsevier Publishing Company, \$23.50).—Work in the Earth sciences during the last 10 years has produced significant additions to man's knowledge of the Earth and has resulted in the development of new and enlightening concepts of the global patterns of tectonic activity. Both the facts and the interpretations have consistently indicated the importance of the role played by island arc regimes in crustal evolution. This book represents a timely attempt by Sugimura and Uyeda to summarize existing knowledge of the nature of island arcs and to evaluate hypothesized concepts of the processes that occur beneath and produce island arcs.

The book is divided into 3 chapters of approximately equal length.

The authors begin the first chapter with a definition of an active island arc, which indicates that the discussion will focus on the adjoining trenches and behind-the-arc basins as well as on the volcanic arcs themselves. An extensive discussion of the geological and geophysical characteristics of island arcs follows, drawing heavily on the arcs of the Japanese Islands for examples. The consistent arrangement of features in zones parallel to the arc axis is emphasized. Chapter 1 concludes with remarks on the recurrence of these characteristics and zonal patterns in other island arcs.

In the second chapter the authors focus their attention on the geological evolution of the Japanese Islands. Sugimura and Uyeda point out that the ancient orogenic belts of Japan display zonal patterns of development similar in arrangement and characteristics to the zones that exist in recent island arc regimes. The authors suggest that island arc processes were responsible for the development of these orogenic belts, and that the rock-record preserved in these orogenic provinces can thus serve to illuminate the temporal patterns of island arc evolution. Although the entire sequence of orogenic events that have affected Japan is discussed, attention is concentrated on the post early Miocene Mizuho phase. Special consideration is given to Quaternary tectonic movements and to the geologic evidence of late Pliocene realignment of island arc activity.

The discussion in the third chapter is based on the premise that descending mantle convection is probably responsible for the activity that occurs at island arcs. Hypotheses developed by the authors and by other investigators are evaluated in light of current evidence to produce an interpretation of the thermal, mechanical, and petrogenetic processes that most likely participate in island arc development. A model of Pacific-type orogeny is then presented and discussed. The authors suggest that their conclusions are in agreement with plate tectonic theory and that interpreted patterns of ancient island arc regimes may provide clues to past patterns of lithospheric evolution.

Island Arcs is on the whole clearly and concisely written. There are places, however, where confusing sentence structure detracts from the authors' presentation.

Illustrations are used extensively to communicate large amounts of information. Most of the figures are clear and well labeled, but several complex illustrations have apparently been substantially reduced and can be read only with difficulty.

For a relatively short book on a large and diverse subject the coverage is remarkably complete. An enormous volume of information and ideas is presented from a wide variety of sources (over 650 references are cited in all). Only a few of the most recent theories or investigations are noticeably absent. The material presented is well organized, extensively referenced, and often placed in perspective by helpful comments on the history of development of ideas or explanations of the significance and origin of the data under consideration.

Sugimura and Uyeda are careful to present their ideas as hypotheses and not as facts. The authors mention the assumptions and difficulties involved with their theories and commonly point out alternative possibilities.

Island Arcs must certainly rate as one of the better attempts to combine diverse geological and geophysical concepts and information in a unified attack on a problem of major proportions. It is a book that deserves to be looked at by any Earth scientists with an interest in problems of crustal evolution on a global scale.

THOMAS R. BULTMAN

ERRATUM

MAGNETOSTRATIGRAPHY AND OROCLINAL FOLDING OF THE COLUMBIA RIVER, STEENS, AND OWYHEE BASALTS IN OREGON, WASHINGTON, AND IDAHO

NORMAN D. WATKINS* and AJOY K. BAKSI**

In our recent magnetostratigraphic study of 237 lavas from the Pacific Northwest (February, 1974, p. 148-189) we included some paleomagnetic data for eight lavas in the Little Sheep Creek section, southwest of Imnaha, Ore. The correct stratigraphic order for these lavas is decreasing age with increasing lava number, so that a polarity change *from* reversed *to* normal is present and not as indicated in figure 9 (bottom right) on page 164. Since the lavas involved were neither subject to K:Ar analyses nor included in our regional compilation (fig. 16, p. 177), this correction does not in any way affect the conclusions reached in the paper. We draw attention to the correct stratigraphic order to assist in refining any current or future local mapping programs.

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