the Law of the Sea that might sweep away all current fishery commissions to bring resource management under the umbrella of the International Authority for the oceans, all we can probably look forward to is disarray and control by unplanned economic and financial reality. And therein lies the best justification of those who continue to hope for a logical outcome for the current series of conferences on the Law of the Sea so painfully dragging on.

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Ocean Wave Power

Energy from the Waves. The First-Ever Book on a Revolution in Technology. DAVID ROSS. Pergamon, New York, 1979. xvi, 122 pp., illus. Cloth, $15; paper, $7.50. Pergamon International Library.

Subtitled "the first-ever book on a revolution in technology," this is not a technical book but a rather breathless, journalistic account of what may ultimately prove to be a useful new source of electrical energy, at least in Britain. The great storm systems of the North Atlantic generally move to the east, so that the seas to the west and north of Scotland, in the North Sea, and in the Bay of Biscay are chronically rough. It has been a dream for generations to harness the power of those great ocean rollers, but only recently have devices been invented that are even remotely practical. The technical difficulties are formidable. The devices must be capable of surviving in storms with waves as high as 20 meters (the height of a six-story building); they must also extract useful power at a reasonable cost from much milder seas and be dispersed sufficiently widely that when the sea is calm in one place there is reasonable assurance of activity in another.

The pioneers in efforts to harness ocean wave energy have mainly been British. Ross's account is derived largely from his interviews with the oceanographers of the Institute of Oceanographic Sciences who told him about the waves; with the inventors, such as Cottrell, Salter, and Bott and Russell, each of whom has a rather different technique for capturing the energy, and with the civil servants of the Department of Energy or the Department of Trade and Industry who support (or don't support) the various endeavors. Cottrell has his articulated raft, which bends in response to the waves, power being extracted by the relative motion. Salter's "ducks," curiously shaped floating tanks strung in a line, nod up and down in the waves and absorb the incident energy flux very efficiently (up to 90 percent). Bott and Russell have designed catching basins, to be constructed at or near a shoreline, into which water is trapped by large nonreturn valves and then passed through turbines. A Japanese device, invented by Masuda, is already powering navigation buoys—can it be improved and scaled up from an output of 60 watts to one in the megawatt range?

The style of the book is informal (plenty of conversation and direct quotations), and Ross does not hesitate to inject his own opinions about the power of the coal and nuclear lobbies or to expose the rivalry, sometimes squabbling, among the participants. There are a few minor technical inaccuracies. The author is sometimes rather uncritical in his advocacy and perhaps less mindful of the difficulties than some of those cautious civil servants, but no matter; the book is a "good read" about an interesting technical development and is adequately illustrated.

A postscript: What would ocean wave power do for the United States? On a national scale, probably not very much. Our seas (except in some parts along the West Coast) are generally calmer than those of Britain, and for us ocean thermal energy conversion or direct solar power from widely dispersed, small sources may well be cheaper and more reliable. Nevertheless, we should keep watching with interest.

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A Continental Rift

Rio Grande Rift. Tectonics and Magmatism. Papers from a symposium, Santa Fe, N.M., Oct. 1978. ROBERT E. RIECKER, Ed. American Geophysical Union, Washington, D.C., 1979. x, 438 pp., illus. $16.

Rifts are long depressions on the earth's surface over places where the lithosphere has ruptured in extension. Most rifts are in oceans, but there are a few well-known active rift systems within continents. The East African, Rhine, and Baikal rifts have been the best described of continental systems, and the Rio Grande rift, a 1000-kilometer-long structure crossing New Mexico and extending into Colorado, has been something of a Cinderella by comparison. As C. E. Chapin explains in his foreword, sophisticated work on the rift dates back more than 40 years to the time of Kirk Bryan, although, as is often the case in geological research, local results have been poorly integrated into general syntheses. Largely with a view to making up for previous neglect, an international symposium on the Rio Grande rift was held in 1978. The 26 papers in this volume were selected from papers that were presented at the symposium. As a result of the symposium the Rio Grande rift has become one of the best-described of continental rifts.

For me there are two primary questions in rift studies: What made the rift system form where it did? and How has the system evolved? G. P. Eaton's paper is the main response in the book to the first question. Rifts are known to form in a variety of extensional regimes, and Eaton shows that extension behind a volcanic arc dominated the Southwest about 30 million years ago when the Rio Grande system was initiated. As is often the case, the precise location appears to be controlled by crustal inhomogeneity. Later, the Rio Grande system became closely linked with the neighboring and much more extensive Basin and Range province. Most papers in the volume concern the question of how the rift system has evolved. An answer to this question requires the integration of geophysical, geochemical, structural, stratigraphic, and petrologic information. It is in the successful exposition of studies of all these aspects of rifts that *Rio Grande Rift* is outstanding.

The papers in the book are likely to become standards against which future rift studies can be measured. Balance among the various aspects of rift study has not been attained, but this is not a reflection on the quality of research. Volcanic rocks are varied and accessible in the Rio Grande system, but the stratigraphy of the nonmarine sediments of the rift is hard to synthesize and commercial seismic results relevant to both stratigraphic and structural studies are not available at present. Altogether, the book is a successful presentation of up-to-date information on the Rio Grande rift. The gaps in coverage may be thought of as indicating the prime research targets for the next decade.

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