

who is an editorial assistant at the Museum of Science in Boston. These authors have combined to weave an intricate story through a century and a half of research on two continents and in the oceans. Although the book is not *The Double Helix*, its personalized approach holds attention and makes complicated relations seem simple and important. It is excellent for those wishing to gain a historical perspective on a major line of geologic research that rivals continental drift in the perennial puzzlement it has engendered for generations of geologists.

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Oceanography Under Sail

On Almost Any Wind. The Saga of the Oceanographic Research Vessel *Atlantis*. SUSAN SCHLEE. Cornell University Press, Ithaca, N.Y., 1978. 302 pp., illus. \$15.

I read *On Almost Any Wind* with mixed emotions—a sense of adventure, a sense of familiarity, a sense of loss. The saga of the R.V. *Atlantis* must touch every oceanographer, not only for her formidable scientific accomplishments, but moreover because she *sailed*—a sailing vessel is unlike any motor-driven ship, it is a creature of the sea.

This is the material of which legends are made. I entered oceanography at the very end of its sailing epoch. The R.V. *E. W. Scripps* was just retired when I entered the Scripps Institution of Oceanography in 1956; the R.V. *Vema* had just had her sailing capability removed when I saw her in New Zealand around 1961; the R.V. *Atlantis* was no longer truly operational when I came east in 1962. Susan Schlee revives that adventurous era to the delight of those of us who entered oceanography with romanticism in our hearts and curiosity in our minds.

The *Atlantis* belongs to an earlier time when questions were simpler, funds were limited, the scientific world was a small fraternity, and ships under sail were still common or a common memory. She began her career in 1931 in the midst of economic hard times as the research vessel of the newly formed Woods Hole Oceanographic Institution, funded by the Rockefeller Foundation.

The *Atlantis* was the first American ship specially designed for oceanographic research. At a length of 142 feet, she was quite large for a sailing ketch but a fine size for a research vessel. This

strikes a good balance between seaworthiness, range, manning requirements, and research capability. Smaller vessels tend to be too much limited by weather and range, and significantly larger vessels are less efficient because of the limitations that exist on the number of operations that can be carried on at one time.

The *Atlantis* was a pioneering ship, and her scientific accomplishments were impressive. Fine scientists carried out their studies aboard her and became famous in the process, or laid the foundations for later fame—fame at least within the profession. A sampling of her work includes studies of the Gulf Stream and its meanders, under Columbus Iselin, the ship's first master; of the geophysical properties of the sea floor (the earlier studies often were marked more by energy expended than results obtained), under Maurice Ewing; of the ocean's sound properties, under J. Brackett Hersey; of deep midwater fauna, under Albert Parr; and of submarine canyons, under Henry Stetson.

Susan Schlee has drawn a lifelike por-

trait of men who sailed aboard the *Atlantis*. I have known only a few of the men personally, but the portrait is one that typifies research vessels. There is dedication and disinterest, friendliness and sharp conflict, great competence and the opposite, rigid morality and otherwise—yet overriding all is the hugeness of the sea and the smallness of the ship. The sea's beauty and lethality work on those confined aboard a ship only 150 paces long to weld them into an extended family with common goals. That "family" may not be a loving one but it is real, and each member periodically puts his life into the hands of his shipmates.

Schlee captures the ambiguous relationship between the scientific party on the one hand and the officers and crew on the other. This relationship can vary from close to sour, depending upon the personalities involved, the weather, the length of the cruise, and so on. The cook is clearly shown to be a vital element.

It is revealing to note the similarities and differences between life on the *Atlantis* and life on a motor-driven oceanographic vessel. The scientific routine is



The *Atlantis*'s trawl "comes up with its net torn off the head rope. The National Geographic Society helped sponsor several [Mid-Atlantic Ridge] cruises, and while this sponsorship produced great photographs and good science, it also yielded some flowery prose that embarrassed [Maurice] Ewing for years." [Photograph by Robert F. Sisson ©National Geographic Society; reproduced in *On Almost Any Wind*]

strikingly similar, despite the *Atlantis*'s being at the mercy of the wind (and her small engine). However, the *Atlantis* was a hard mistress, and severe accidents were not uncommon; sails clearly added hazards.

Inevitably, the limitations of sail and age caught up with the *Atlantis*. Gradually she was relegated to minor tasks as scientists transferred their research to more versatile, if less glamorous, ships, and in 1963 she was replaced by the excellent new *Atlantis II*. In 1966, the *Atlantis* was sold to the Argentine Navy to continue her career as *El Austral*. Considerable effort was spent in her refurbishment, and she is still carrying out research, though on a reduced schedule.

The story of the *Atlantis* is also the

history of an important part of oceanography. The vitality of oceanography elsewhere, both in the United States and abroad, during the period covered is really only hinted at in the book, and the reader might conclude incorrectly that the oceanographic world was centered on the *Atlantis*. Yet it is unfair to Schlee to criticize this aspect too heavily, for what she set out to write was an intimate history of one ship. In this she has succeeded well. Readers who are unfamiliar with the *Atlantis* will find a wealth of scientific history and personal details, and those who are part of that history will find nostalgic portraits of their shipmates and their ship.

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A Lake of Great Renown

Lake Kinneret. C. SERRUYA, Ed. Junk, The Hague, 1978 (U.S. distributor, Kluwer Boston, Hingham, Mass.). xii, 502 pp., illus. \$63.40. Monographiae Biologicae, vol. 32.

No lake in the world has had so intimate an involvement in the history of human religion as Kinneret, known from the New Testament as the Sea of Galilee, and few areas have so rich a record of the more secular concerns of humanity as the Kinneret basin. Since the appearance in the Early Pleistocene of Lower Paleolithic humans a full panoply of prehistoric and historic peoples have left their imprint on the land. Kinneret enters

the historic period in 1600 B.C. with an Akkadian tablet listing the gods of Ugarit, one of whom, the music-loving Kinnar, gave the lake its name. By that era the fisheries of Kinneret were already famous; later they sustained, both symbolically and metabolically, the rise of Christianity. They are still significant, but in modern times it is the water of the lake that irrigates the economy of Israel and generates the scientific and practical interest that has made this book possible.

Quite properly for such a lake Serruya has employed a historical perspective in planning the book. The stratigraphy, tec-

tonics, and evolution of the Jordan valley are covered at length. Only fishes, among the vertebrate groups, receive more attention than prehistoric humans. Even topics that are not historical in nature, such as meteorology, limnochemistry, and zooplankton are introduced by historical essays. Some topics have been studied since the time of Josephus Flavius. The groundwork for others was laid in the 18th, 19th, or early 20th century, when a voyage to the Holy Land was still an adventure. Sustained study of the lake dates from the establishment of the Kinneret Limnological Laboratory in 1968, and for some topics, such as fish population dynamics, the historic period has hardly begun.

Some groups of plants and animals are accounted for largely through species lists, but a more dynamic treatment is possible for the phytoplankton, especially *Peridinium cinctum*, the dinoflagellate that dominates primary production. Synopses are presented of the natural history of the principal groups of organisms living in and around Kinneret. Where sufficient information exists an account is given of the biogeographic affinities of the Kinneret representatives and of their distribution in the lake. Seasonal events in the lake affect the distribution of its biota—for example, the area of the bottom swept by standing waves on the thermocline during the season of stratification has an impoverished benthos of species that can tolerate repeated immersion in oxygen-poor water. The epilimnion and even the hypolimnion, where reducing conditions are more severe but more predictable, has a richer benthic community. Particular attention is paid to endemic species, such as the blind prawn, that are likely to be endangered by cultural modification of the lake.

This is a book that will serve its primary purpose of providing a handbook of knowledge for those who study and manage Lake Kinneret. In the wider world it will be of use to comparative limnologists of either a chemical or a biological persuasion, to systematists, to biogeographers, and especially to readers interested in the rational exploitation of water resources. It should serve even biblical scholars who are interested in what fish Galilean fishermen took when they cast their nets on the other side, or what daily pattern of winds buffeted them as they did so.

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The Meshushim pool, Meshushim River, Golan Heights. The prismatic columns of basalt formed during the slow solidification of lavas. [From *Lake Kinneret*]