Interest in this general subject continues to expand rapidly. One consequence is that many significant developments have taken place since this book (which has many 1980 references and a few 1981 ones) went to press. For example, Briand has provided an excellent catalogue of 40 food webs (and a later study of 62 webs is circulating among the Invisible College); Yodzis has argued that food chain lengths can indeed be explained on energetic rather than dynamical grounds; it has been shown by Nunney and by Abrams and Allison that extensions of the simple Lotka-Volterra models to include realistic refinements (such as time lags or nonlinearities in the functional and numerical responses of predators to prey densities) can significantly modify the dynamical properties; and so on. These developments were well covered at a recent conference, the proceedings of which are available as an Oak Ridge Technical Report (D. L. DeAngelis, W. M. Post, G. Sugihara, Eds., *Current Trends in Food Web Theory*, ORNL/TM-8643 [1983]; for an overview of the issues covered in this report, see R. M. May, *Nature* **301**, 566 [1983]). None of this, however, diminishes the value of Pimm's book as the best introduction to the subject that is currently available.

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Limulus

Physiology and Biology of Horseshoe Crabs. Studies on Normal and Environmentally Stressed Animals. JOSEPH BONAVENTURA, CELIA BONAVENTURA, and SHIRLEY TESH, Eds. Liss, New York, 1982. xviii, 316 pp., illus. $48. Progress in Clinical and Biological Research, vol. 81.

In the summer of 1980 a *Limulus* expedition was organized, not aboard the *Alpha Helix* but at Duke University's Marine Biomedical Center. The editors of the resulting volume indicate that the spirit of the intellectual expedition cannot be adequately reflected in the published papers. The book is nevertheless an enthusiastic example of a multidisciplinary account of a non-mammalian species.

The 18 papers, a somewhat haphazard collection of reviews and research reports, vary greatly in length and purpose. A grand review of the natural history of horseshoe crabs and a substantial description of their developmental stages with figures and diagrams form the two opening papers. These are followed by a set of brief notes and longer research reports on osmotic, respiratory, and circulatory physiology, including a concise review of the anatomy and physiology of the *Limulus* heart and blood circulation. This set leads via a paper on coxal gland function—a paper that mixes primary data with a review and a comparison with other crustaceans—to a set of papers on blood physiology and biochemistry. The focus of these papers is on the structure and function of hemocyanin, of which they provide a state-of-the-art review.

The current surge of interest in *Limulus* blood for medical and pharmaceutical purposes is only a peripheral issue here (the subject is covered in *Biomedical Applications of the Horseshoe Crab*, E. Cohen, Ed., Liss, 1979), although it is mentioned in the context of invertebrate disease studies in a short paper by the late Frederik Bang, to whose memory the book is dedicated, and Betsy Bang. These authors emphasize the importance of invertebrate studies to human health problems, a fact not generally recognized by the public or in funding policies. In a brief note, Anne Rudloe makes a plea for environmental health and laws protecting *Limulus* from human plunder. The final paper, by Sidney Galler and Bernard Zahuranec, deals with biological policy matters in general. The authors advocate stronger representation of biologists in national policy decisions and urge biologists to take an active role rather than staying at the bench or the beach exclusively. One wonders why such pleas are hidden in the tail section of a book on *Limulus*. The message of these papers deserves attention.

Conferences—or expeditions—focusing on one or a few related species serve eminently the function of disseminating diverse facts and theoretical models among different scientific disciplines. They also serve to remind us that we deal, even in the laboratory, with animals that evolve as physiological entities both in harmony and in competition with their environments; in turn, these animals are part and parcel of our own environment. Thus I applaud the multidisciplinary principle upon which the present book is founded. However, I regret that more of the outstanding *Limulus* physiologists—for instance in photoreception and vision—were not included. The book's title promises more than is actually included. May other expeditions follow!

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Tempestites

Cyclic and Event Stratification. Papers from a workshop, Tübingen, Germany, April 1980. G. EINSELE and A. SEILACHER, Eds. Springer-Verlag, New York, 1982. xiv, 536 pp., illus. Paper, $29.50.

Sedimentologists have commonly been subdivided into catastrophists and non-catastrophists, depending upon the importance they attach to rare catastrophic events in molding sedimentary sequences. The early 1960's were dominated by proponents of non-catastrophic or cyclic sedimentation—the explanation that repetitive alternations or sequences of sedimentary layers represent periodic, gradual changes in the paleoenvironment. In the mid-1960's, cyclicity enthusiasts received a setback, as many modern and ancient basins were finally recognized to be filled with turbidites, centimeter- to meter-thick packages of sediment that episodically swept in as gravity-driven turbidity currents. A second setback occurred in the late 1960's, as many finely laminated limestone and dolomite sequences were reinterpreted to be not quiet-water basinal deposits but algal-influenced storm deposits of tidal flats. A rather quiescent decade followed.

Now, here come the tempestites.

Tempestites, a vivid term for sedimentary stratification produced by episodic storm events, have gained wide recognition in European rocks and are gradually taking hold in America. This book's greatest excitement (and bulk) lies in the presentation by Seilacher and colleagues of the concepts of and evidence for sedimentation by "rare episodic events" (the term "catastrophic" has fallen into disfavor).

Most pleasing is the rigorous evidence provided by many of the authors that layering in the sediment sequences documented is indeed of storm origin. Evidence for storm stratification is drawn from an intriguing, but logical, integration of sedimentological characteristics, early diagenetic fabrics, paleoecological attributes, and post-event biological responses.

Tempestites are documented from ancient shallow marine, shelf, and epeiric sea settings, as well as from areas slightly below wave base, where storm-generated bottom flow is thought to carry sediments seaward for some distance. Twenty papers and one abstract focus on tempestites and four papers on turbidites.

Cyclic and Event Stratification, however, attempts to cover more than event stratification. There are also sections on