

tugal, Italy, France, Belgium, the British Isles, and the Netherlands. The treatment benefits from the author's extensive research and excavation in Poland and provides access to much literature that is not readily available to the English-speaking reader, but those seeking an overview of the entire continent will still have to turn to the primary literature. Now, though, they will at least have the general framework provided by this book for guidance.

The book begins with chapters on geography and the preagricultural background. The remaining chapters are arranged in chronological sequence, and each is divided into sections on economy, settlement, sociopolitical organization, and ritual, with in some cases additional sections devoted to special topics such as warfare and fortifications, writing, and local state development. The discussion of sociopolitical organization uses the general framework of level of complexity—band, tribe, chiefdom, and state—defined in terms amenable to archaeological determination. The benefits of this organization are that it imposes order upon a large and complex body of data and permits easier comparisons through time and space. The drawbacks include a tendency to impose uniformity at the expense of local variation and to compartmentalize different aspects of cultural behavior, obscuring their relationships. Examples for different sections within a chapter are often drawn from different sites or areas, further obscuring the relationships.

To illustrate the account numerous tables of food remains and burial goods are presented. Unfortunately, the data are presented without context, so that little evaluation of the tables can be made without extensive research into the primary sources. The many charts give (and were perhaps chosen to give) an impression of the variability among sites, though the text downplays this variability.

Within the framework the author has adopted, the trends of culture change are described. The processes underlying these trends are dealt with only in general terms. For example, it is stated (p. 45) that the archeological differences between the Neolithic of southeastern Europe and that of the Near East are "to some extent . . . accounted for" by environmental conditions, but no elaboration is offered. The expansion of farming populations from the southeast is likewise proffered with little support as the most likely explanation for the initial appearance of domesticates in much of Europe. The implications of this process of ex-

pansion, such as the differences between frontier and heartland in terms of selective pressures, the sociopolitical significance of the adoption of longhouses in Central Europe, and the relationships between farmers and foragers, are virtually ignored.

Overall, this is a cautious presentation of the trends of culture history, downplaying earlier sweeping interpretations involving massive early migrations and simplistic economic dichotomies between farmers and raiding pastoralists. On the other hand, little is advanced to replace these generalizations and no new theoretical ground is broken. A more stimulating presentation might have been achieved had Milisauskas taken a stronger theoretical position and presented more specific hypotheses to explain spatial variation and temporal change. The recommendations for future work could then have been in the form of testable hypotheses rather than the vague suggestions for further excavation or more frequent regional studies presented here.

On the whole, this book is valuable and welcome as a summary and partial synthesis of a complex culture history. It may stimulate many questions, but their answers, even in the form of initial hypothesis formulation and evaluation, must be pursued well beyond its pages.

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The Phylogeny of Clams

Evolutionary Systematics of the Bivalve Molluscs. Papers from a meeting, London, May 1977. The Royal Society, London, 1978. pp. 199-436, illus., + plates. Paper, £17. Philosophical Transactions of the Royal Society, London, series B, vol. 284.

Since their initial radiation in the Ordovician, clams have developed the "most successful of all types of ciliary feeding mechanisms," and they show a reasonably steady and continual increase in taxonomic diversity up to the Recent. They are the subject of a rich fossil record stemming from their center of abundance in shallow-water marine areas and provide significant material for students of evolutionary phenomena, taxonomists, and stratigraphers. Unfortunately, for much of this century clam evolution and higher classification attracted very few workers. Some paleontologists continued the Douvillean tra-

dition of studying hinge and shell, while a school of mainly European workers, characterized by Paul Pelseneer, derived classifications from gill structure.

Inspired in large part by the nearly 50 years of holistic studies of C. M. Yonge on clam functional morphology, paleontologists have recently expanded their horizons to include living specimens, and several neontologists have extended their study horizons backward in time. This symposium proceedings is a major status report on the knowledge of and opportunities for study presented by this ancient group. The leading contemporary workers on clam evolution and systematics have summarized their current thinking, providing a mine of ideas for evolutionary biologists seeking data-rich sources for investigation as well as achieving a quantum jump in the information available to malacologists.

The advances are many, and the descriptions of new ordinal and class level taxa are almost incidental to them. A major function of the volume is to focus attention on matters of total uncertainty and controversy. J. Pojeta beautifully documents the initial clam radiation in the Ordovician in a paper that overlaps with a survey of the Rostroconchia by B. Runnigar. These authors' controversial views on the initial radiation of the mollusks are consolidated and refined, but there is no agreement as to clam origin or the systematic position of early experiments in "bivalvity." Pojeta and Runnigar believe that the Rostroconchia are ancestral to the Bivalvia and are the only extinct class of mollusks; O. A. Scarlato and Y. I. Starobogatov place them as a suborder of the order Septibranchia; and E. Yochelson continues to believe that they are only one of several extinct molluscan experiments.

Most of the papers mark genuine advances in knowledge or are well-crafted summaries of recent major studies. J. A. Allen points out that the extant deep-sea bivalve fauna is most similar in life-style to the initial Ordovician radiation and probably consists of ancient survivors thereof. Kauffman's study of evolutionary rates in Cretaceous bivalves, Stanley's review of the Trigoniidae, and Waller's major revision, taking a Hennigian approach, of the Pteriomorpha all provide major conceptualizations based on factual observations and stratigraphic data. On a more philosophic level, the contributions of Skelton on rudist design and Thomas on arcid limitations provide stimulating views of important groups.

The more general survey papers include a well-balanced review by Newell and Boyd of approaches to evolutionary

studies of clams, a modest phenetic analysis of clam anatomy by Purchon, and J. A. Allen's intriguing review of the deep-sea protobranchs. Only the superficial remarks of Bass on the number of higher categories in the Bivalvia, which ignore the complexities and length of evolution, give no new evidence or interpretations, thus falling well below the standard of the other contributions.

Most of the studies involve some aspect of morphology, with updated accounts of structures in the hinge (Morris), ligament (Yonge and Waller), and gills (Owen) added to descriptions of changes through time (many authors). All of these extend our knowledge considerably. Only one paper, on local variation in protein polymorphism, attempts to integrate biochemical aspects, indicating a major open area for investigation.

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(Continued on page 1439)