

and S. M. Manton that the Crustacea were derived from the Trilobitomorpha and that the principal division within the Arthropoda is between a terrestrial lineage (Onychophora–Myriapoda–Insecta) and a marine lineage (Trilobitomorpha–Crustacea–Chelicerata).

Paleozoogeographic and paleoecologic studies of trilobites have been stimulated in part by developments in global plate tectonics. Given the changing positions of continents with time, the paleontologist has the fundamental problem of distinguishing among ancient marine faunas that are geographically widespread because the original preferred habitat was widespread, those that are geographically widespread now because their original habitat was fragmented and displaced by tectonic processes, and those that lived close together originally but were separated by environmental barriers, for example when warm and cold ocean currents were juxtaposed. R. J. Ross, Jr., attempts an explanation of patterns of distribution of early Paleozoic trilobites with reference to oceanic surface currents and inferred positions of continental blocks. Such "best fit" models may stimulate new hypotheses, but they are difficult to test because the variables that can affect faunal distributional patterns are difficult or impossible to isolate and evaluate separately. A different approach is taken by R. A. Fortey in an analysis of Early Ordovician trilobite communities of Spitsbergen. Relative abundance and taxonomic associations of trilobites are related to an environmental gradient from shallow to deep water. Trilobites in the various communities had different potentials for geographic dispersal and phyletic longevity. Fortey's results show the value of meticulous attention to taxonomic, taphonomic, and sedimentologic data. Similarly detailed work is greatly needed in other parts of the world and would undoubtedly lead to a clearer understanding of paleozoogeographic patterns and community evolution in a world of changing geography.

R. A. Robison applies modern ecological theory to interpretation of some Middle Cambrian pelagic agnostoid trilobites. Detailed morphologic and taxonomic studies suggest that some agnostoids conform to an allopatric model of speciation. Competition among secondarily sympatric species led to segregation by depth and character displacement with respect to size. In turn, these factors may account for increased species diversity during Middle Cambrian time.

In one of the more stimulating articles, D. C. Fisher reports an experimental

study of the functional morphology of the living xiphosuran *Limulus* and a Jurassic relative, *Mesolimulus*. Fisher has experimentally examined the hydrodynamic and mechanical properties of the form of the prosoma in *Limulus* and has related them quantitatively to swimming and burrowing efficiency. Armed with these data, he builds a convincing argument for swimming and burrowing behavior in *Mesolimulus* and discovers the relative importance of swimming and burrowing in the two genera. The significance of Fisher's paper goes beyond its importance to the study of xiphosurans. His clever application of hydrodynamic principles and experimental methods to gain quantitative information on behavior of a fossil form is a model of analytical strategy that could benefit most functional morphologists.

Unfortunately, the book is marred by defects of production. Some photographs are washed out, several photographic plates are transposed between papers, and in my copy one article has four blank pages. Apparently the most serious flaw is the omission of charts from the text-figures in the article by J. H. Stitt, an oversight that eliminates the basic data upon which Stitt's interpretations are based.

In spite of these flaws, the book has great scientific merit, and no biological or paleontological library should be without it.

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