cussion of detectors and a somewhat biased and incomplete look at spatial interferometry techniques in the infrared. A very general overview of spectroscopic techniques is given by Harwit. Again, the paper contains an excellent set of references with informative annotations. In addition, V. Daneu *et al.* present a seminar on the design of a four-color bolometer system, and A. F. M. Moorwood discusses the potential for infrared observations from space and some proposed projects for making such observations. Although many of the projects he discusses are still in the planning stages, with details of the designs likely to change, the paper describes a wide variety of approaches and opportunities for infrared astronomy from space.

In summary, the strength of the book lies in the emphasis on basic physical processes associated with regions and conditions of star formation and cosmic background radiation. For students and researchers interested in these subjects, the book would be valuable. The weakness of the book is clearly in its coverage of recent infrared observational results. There are many very interesting studies in high- and low-resolution spectroscopy, photometry, and mapping at a wide variety of spatial resolutions that are not included in the volume. For this reason *Infrared Astronomy* does not succeed in its goal of acquainting students and researchers with the exciting recent results and prospects in infrared astronomy.

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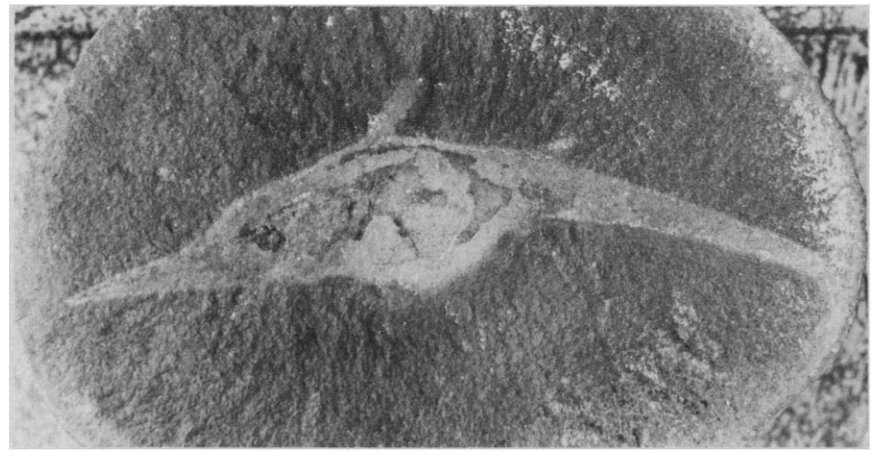
A Pennsylvanian Biota

Mazon Creek Fossils. Papers from a symposium, Ann Arbor, Mich., May 1978. MATTHEW H. NITECKI, Ed. Academic Press, New York, 1979. xviii, 582 pp., illus. $29.50.

In the Pennsylvanian a river discharging south into a sea in what is now northeast Illinois built a delta that supported a diverse assembly of plants and freshwater or terrestrial animals on its subaerial parts and, in its interdistributary embayments and farther offshore, a distinctive invertebrate fauna. During floods or storms, turbid distributary water spilled over or through levees, and mud and sand built out as crevass splays into interdistributary bays, inundating the coal swamps at their heads and quickly entombing the transported remains not only of terrestrial inhabitants of various delta-plain environments but also of marine organisms that lived in the bays or were swept into them during the storm. Before compaction of the crevass-splay deposits, many of the buried organisms accumulated a protective crust of iron carbonate (or siderite), which protected them from compression as the muds compacted and acted as the nucleus for accretion of further siderite. From these concretions, collected for a century along Mazon Creek and elsewhere in northeast Illinois by paleontologists, have come remarkably well-preserved representatives of nearly 700 plant and animal species—the celebrated Mazon Creek biota.



Similihariotta dabasinskasi, new genus and new species. "This specimen, being very immature, shows virtually nothing of its skeleton. . . . [Its] outline. . . recalls very definitely the modern chimaeroid *Hariotta* with its elongated rostrum, short and stout thorax and the long, slender, pointed tail. . . . Whether this is . . . a Paleozoic member of the genus *Hariotta* cannot be resolved on the basis of this single specimen. The possibility should not be ruled out, however, merely because of the great difference in geologic age; after all, lampreys not greatly different from the modern ones also occur in this fauna. . . . On the other hand, greatly elongated rostra appear to have been fashionable in the Pennsylvanian . . . and it is thus also possible that the overall shape of *Similihariotta* constitutes a convergence with the modern forms." [From R. Zangerl's contribution to *Mazon Creek Fossils*]

Mazon Creek fossils have been described in some 270 papers, but the volume at hand is surely the best current source of information on the Mazon Creek biota. Matthew Nitecki and Alan Horowitz summarize previous research. Charles Shabica discusses deltaic sedimentation and concludes that a low-gradient model operating under static sea-level conditions approximates conditions of formation of the concretion-bearing Francis Creek Shale. Gordon Baird summarizes the lithology of, and distribution of fossils in, the Francis Creek Shale; and Bertram Woodland, Richard Stenstrom, and James Schopf comment on the origin of the Francis Creek concretions. Schopf also describes methods of preparing Mazon Creek concretions to maximize study of enclosed plant materials. Hermann Pfefferkorn notes that the Mazon Creek flora owes its high diversity to extensive natural sampling of several deltaic subenvironments in which living conditions were ideal and is likely of Late Westphalian D age.

Merrill Foster's suggestion that *Tullimonstrum gregarium* is a heteropod gastropod and his interpretation of the objects informally termed "blobs" as scyphozoan coelenterates (jellyfish) merit attention from other specialists. Daniel Fisher's morphological-behavioral analysis of *Euproops danae*, a common Mazon Creek horseshoe crab, also deserves close scrutiny, for it leads to the unsettling suggestion that subaerial activity may have been "part of the behavioral repertoire of *E. danae*, and euproopids in general." Rainer Zangerl's description of five new species (of four new genera) of cartilaginous fishes and David Bardack's general summary of Mazon Creek fishes suggest there are still many things to be learned about this amazing biota. And, finally, John Bolt parlays information from some well-preserved Mazon Creek amphibians into, progressively, a consideration of amphibian life-history strategies and a discussion of the implication of these for functional morphology.

The book is well made. It contains much that is new and excellent summaries of a lot that is not and has few errors. The volume is a substantial tribute to Eugene Richardson, of the Field Museum, to whom it is dedicated.

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