could take for a new graduate student in evolutionary biology would be to put Stearns's book in her or his hands and say, "Read this."

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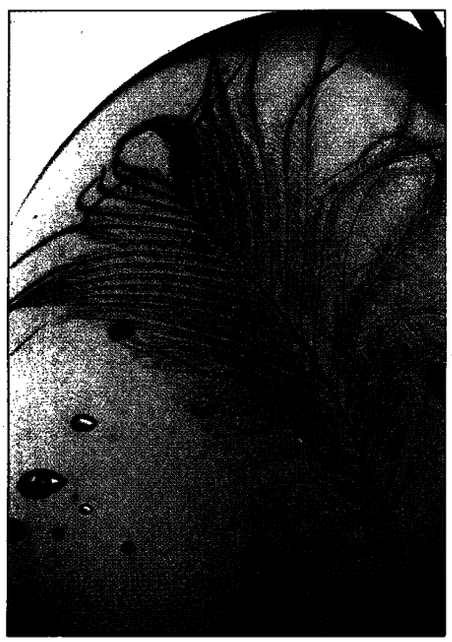
Windows in Time

Life In Amber. GEORGE O. POINAR, JR. Stanford University Press, Stanford, CA, 1992. xvi, 350 pp., illus., + plates. $55.

Dinosaurs capture the popular imagination, but the romance of amber is rapidly gaining ground. Amber is fossilized tree resin, hardened and rendered inert over millions of years of polymerization. Hundreds of deposits of various botanical origins occur around the world, varying in age from the Carboniferous to the Recent. Insects and other small organisms became mired in the sticky ancient resin before it hardened, as did some wafting plant debris. The result: fossils in exquisite three-dimensional detail, sometimes with ultrastructural cellular detail seen in living tissues. The recent publication of DNA sequences from two groups of insects in 25- to 30-million-year-old amber shows that it may provide the most consistent preservation of fossilized DNA. Organisms aren't the only "fossils" in amber: paleoclimatologists debate just how ancient the air in amber bubbles really is.



"A feather in Dominican amber." [From *Life in Amber*; Smithsonian Institution collection]

The paleobiology of such a unique kind of fossil is thus rich and diverse, and *Life in Amber* attempts a synthesis.

The bulk of the book is devoted to brief family-by-family treatments of fungal, plant, and animal inclusions, such as the myriad insects in the Tertiary ambers, particularly those from the Dominican Republic and Mexico. The whole book, in fact, is very similar in scope and format to Sven Larsson's 1978 book *Baltic Amber: A Palaeobiological Study* (Scandinavian Science Press, Klampenborg, Denmark). Larsson was able to draw upon a century of European research on Baltic amber; research on the New World ambers, by contrast, is in its adolescence. Production of a book like this owes a great deal to several individuals in particular. One is Jean Langenheim, whose classic 1969 *Science* article on the botanical origins (as determined with the aid of infrared spectroscopy), localities, and ages of the world amber deposits will always be an invaluable reference. The other is Dieter Schlee, curator of amber at the Staatliches Museum für Naturkunde in Stuttgart. Schlee has globe-trotted in pursuit of breathtaking specimens of fossiliferous and other ambers from around the world. It is a pity that no photographs of fossils from that wondrous collection or other major ones are used to grace the pages, which mostly show just specimens from Poinar's personal collection.

Another unique aspect of "amberization" is the examples of parasites and inquilines preserved with their hosts. A chapter is lavished upon this favorite subject of Poinar's, who is himself a parasitologist. Several specimens in various collections show my favorite such example: a phoretic pseudoscorpion with one claw latched onto the hind end of a wood-boring beetle, hitching a fateful ride.

Arthropods (by far the most numerous and diverse inclusions in ambers) are the first great radiation of terrestrial animals; they originated in the Devonian, and some modern orders appeared in the Permian. The faunas in Tertiary ambers are essentially modern in terms of genera and families, so they reveal little about higher relationships. Yet, evolutionarily, there are some surprises. Between 1940 and 1970 Kjell Ander and Willi Hennig (the renowned insect systematist) found that numerous insect fossils in Baltic amber have their closest living relatives at the southern end of the earth. Within the Dominican amber there are also some startling extinctions, many as yet unpublished. Little is said about this in the concluding section, where in fact Poinar goes awry on biogeography. He confuses the presence of a group in Dominican amber as evidence of Caribbean island vicariance. The age of such a fossil merely establishes a possibility that a certain tectonic scenario influenced modern distributions.

"A mushroom, *Coprinites dominicana* Poinar & Singer, in Dominican amber." [From *Life in Amber*; Poinar collection]

The book is more review than synthesis, and, errors of interpretation and omission aside, it will appeal to any paleontologist and insect biologist. It is to be hoped that it will inspire further American interest in amber paleobiology, which has traditionally been the provence of Europeans.

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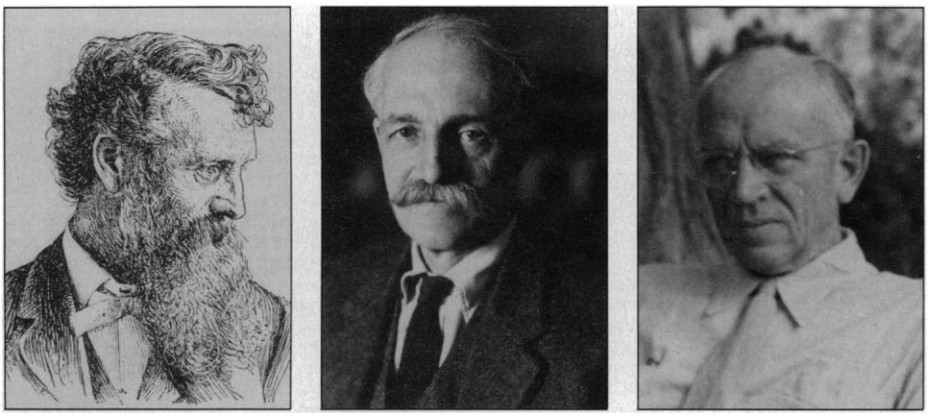
Environmental Philosophies

Toward Unity Among Environmentalists. BRYAN G. NORTON. Oxford University Press, New York, 1991. xvi, 287 pp. $29.95.

After Earth Day. Continuing the Conservation Effort. MAX OELSCHLAGER, Ed. University of North Texas Press, Denton, 1992 (distributor, Texas A&M University Press, College Station). xxi, 241 pp. $24.50; paper, $15.95. Philosophy and Ecology.

The environmental movement, so some have observed, is a notably pragmatic affair. While those whose main task is one of dealing with ideas have often found environmental matters to be grist for their mill, they have remained apart from the main scene of action and often appear to be somewhat irrelevant to it. There are few journals of environmental theory, in sharp contrast, for example, to the many publications on economic theory that socialists were long known for. Instead, the environmentalist journals are journals of action, working out the details of concrete policies and exhorting their followers not so much to think rightly as to act rightly.

Amid this context, the main theory has



Environmentalists: John Muir, Gifford Pinchot, and Aldo Leopold. [From the Granger Collection (Muir and Pinchot) and the Wilderness Society (Leopold)]

come from philosophy, the main journal has been *Environmental Ethics*, and the main theoretical problem has been the conflict between biocentrism (or ecocentrism) and anthropocentrism, with the focus on the assertions of the biocentrists as to the need to put nature first and the dire environmental consequences of putting human life first. The dichotomy has fueled much debate, and those who emphasize biocentrism, known usually as deep ecologists, have enjoyed a fair amount of publicity in the popular press. But deep ecologists have had little success in affecting the course of environmental action, and often when they do, as in protecting a natural system from development, they adopt the customary pragmatic action of finding some way for private or public bodies to insulate an area from the private market so as to "save" it. The recent division within the main deep ecology organization, Earth First, has somewhat muted this philosophical approach in favor of the concrete strategies of fostering *Wild Earth*, as the new periodical in this field is titled. Yet the philosophical debate continues among philosophers.

These two books are products of this philosophical debate. One, by Byron Norton, professor of philosophy of science and technology at the Georgia Institute of Technology, works out the author's own approach to the controversy within the environmental community; Norton believes that the controversies are debilitating, and he develops a rationale to foster "unity among environmentalists." The other, edited by Max Oelschlaeger of the University of North Texas, is more a product of the complex of environmental specialists at that university, where Oelschlaeger is professor in the department of philosophy and religious studies. His volume stems from a conference held at that university, with some participants from North America at large but most from the university faculty. The chapters in the volume are more diverse, without a clear philosophical orientation but with a strong plea by Oelschlaeger himself for the role of religion in fostering environmental objectives.

Norton believes that the issues of controversy within the environmental movement are real, but that at the same time they are artificial because the dominant course of environmental action is practical, pragmatic, and focused on solving problems. He reviews the traditionally defined tension between the biocentric view as epitomized by John Muir and the use-oriented tradition of conservation exemplified by Gifford Pinchot and argues that environmentalists waste much time and energy and foster unnecessary divisions by fighting through that battle. It is far more important, he argues, that environmentalists have focused heavily, especially in the past several decades, on practical situations in which those who are philosophically at odds work out solutions to problems on which they fundamentally agree.

To underpin this argument Norton cites a broad range of issues such as the pressures of growth, pollution control, biodiversity, and land-use policy; as these problems are dealt with, so the argument goes, divisions in philosophical debate become muted amid concentration on practical solutions. This tendency reflects an underlying unity among environmentalists that is more powerful than the oft-described ideological differences. The differences are more a matter of means; the ends are more unifying. Norton considers Aldo Leopold to be the main ideological architect of a more pragmatic approach and describes his outlook variously as "contextual management" or "intergrated management." At the same time the new professional discipline of conservation biology provides a similar outlook and guidance, with a primary focus on the "ecological health of natural systems."

The tone of *After Earth Day* is far more pessimistic than that of Norton's book. Whereas Norton seems to see hope in the pragmatic directions of integrated ecological management, Oelschlaeger works from pessimism about the course of environmental affairs. Despite much environmental action between Earth Day I and Earth Day XXI, the environment has gotten worse and something must be done to change course. Oelschlaeger has brought together a wide range of specialists who write about a wide range of topics, ranging from philosophy to technical applications and business attitudes to environmental education, science, and politics, to set the new course.

As a result the book is diffuse and highly uneven. To this reviewer the most useful chapters are, in fact, those that seem to confirm Norton's arguments—one by Pete Gunter, who, drawing on his experience in the politics of protecting the Big Thicket in Texas, offers pithy but highly sound guidance for those who would venture into the "trenches" of environmental politics; one by Eugene Hargrove, who emphasizes that despite the dichotomy of ecocentric and anthropocentric views both are human views, the choices are human choices, and the course of environmental action requires changes in human attitudes and actions; and one in which Susan Bratton points out that, contrary to the much-cited views of Lynn White, who emphasized the role of Christianity in establishing the Western effort toward human domination and exploitation of nature, a more basic streak in Christianity praises the divine creation of nature.

Yet despite these more helpful chapters, the tone of the book seems to come from Oelschlaeger, who in his final chapter brings the reader back to philosophy, his own philosophy, that in the worsening crisis environmentalism needs crucially a religious underpinning. While Norton moves environmental philosophy into the practical realm, and hence closer to the overarching emphasis in the environmental movement on practical action, Oelschlaeger argues that this will be ineffective without a firm philosophical underpinning that religion uniquely can provide.

It seems rather clear that the environmental movement will continue to devote its time and energy to practical action in private and public affairs, that whatever philosophical implications are involved will remain implicit and generally unarticulated by the actors, and that philosophical issues will continue to be debated by philosophers in their own specialized publications and meetings somewhat remote from the world of environmental action.

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