



BOOKS: ENVIRONMENT

History in Flames

Johan Goudsblom

In ancient Rome, a sacred flame was kept burning continuously in the temple of the vestal virgins. For Stephen Pyne, this fire epitomizes the European attitude toward fire: "Europe" celebrates the tended fire, contained in hearth, shrine, or furnace, and

abhors fire running wild in forests, fields, or cities. As Europe's supremacy increased, this attitude became dominant all over the world. Still, our century has witnessed an unprecedented proliferation of anthropogenic conflagrations, including the fire storms that ravaged Dresden and

self be carried away by his verbal virtuosity. As a result, the prose sometimes is long-winded and relies on suggestive metaphor rather than rigorous argument.

The author's excessively eloquent style makes reading *Vestal Fire* alternately delightful and exasperating. There is also a more substantive reason for ambivalence. In spite of the great scope of his vision, Pyne deals only cursorily with an issue that, in my view, has been crucial for the history of the human use of fire and especially for the part played by Europe in that history: the development of industrial fire.

theon. The history of furnaces, from modest kilns for baking pottery and forging copper to the enormous industrial power plants of today, is virtually absent from his book. The index contains no reference to the steam engine. Internal combustion appears only a few times, almost as a *deus ex machina*.

Yet if Europe has made any specific contribution to the human use of fire, that has been the development of industrial fire. There is some vague and tacit acknowledgment of this fact in Pyne's book; but the point he explicitly (and, to me, erroneously) emphasizes is that Europe's contribution lay in an attitude of religious devotion to an altar—to Vestal fire. For the sake of this point, he is forced to leave the concept of "Europe" very much in the air. In his use, it appears to refer to a geographical area as well as to a culture, a way of life.

I have a fundamental disagreement with Pyne over his idea that the Neolithic represented "the first act of domestication," when modern humans began to domesticate themselves. This notion expresses a basic misunderstanding about the very nature of the uniquely human capacity to manipulate fire. That capacity has been made possible, from its earliest beginnings in the Paleolithic, by a blend of social control and individual restraint—in other words, by some form of self-domestication (1). The sociological and psychological implications of this point lie largely beyond Pyne's interests. He is, after all, not a social or behavioral scientist, but a historian fascinated by fire. His strength lies in description and evocative generalization rather than theoretical analysis.

Pyne is at his best when writing about extensive fire, wildfire and rural fire that often range over vast areas. He brings to that subject an enormously wide reading, which he combines with his personal experiences as a fire fighter in natural parks and as an active participant in discussions about conservation policies. His book contains excellent and eye-opening sketches of European geography, organized around the major gradients of temperature (South-North) and moisture (East-West) and their bearing upon both wildfire and human broadcast fire. Altogether, *Vestal Fire* is an invaluable contribution to the still scarce literature on the relations between humanity and fire.

References and Notes

1. J. Goudsblom, *Fire and Civilization* (Penguin, London, 1992).

Vestal Fire
An Environmental
History, Told through
Fire, of Europe and
Europe's Encounter
with the World
by Stephen J. Pyne

University of Washington Press, Seattle, 1997.
680 pp. \$34.95. ISBN 0-295-97596-2.

Tokyo in World War II as well as the huge forest blazes in places such as Brazil and Indonesia that nowadays catch the headlines with dire regularity.

These observations set the stage for *Vestal Fire*, a highly original book about a very important subject. With it, the author has completed his ambitious "Cycle of Fire" series, five volumes examining the history of fire on every continent. *Vestal Fire* focuses on Europe; but since, as Pyne contends, European attitudes toward fire have become global, the last part of the book encompasses the entire planet.

The book fully deserves such compliments as awesome and magisterial. Pyne is the world's leading authority on the history of fire, and his erudition is phenomenal. He offers us a broad panorama of ecological and human history in a framework of geology and geography. He shows what a great impact fire has had in shaping landscapes, flora, and fauna all over the world, and how in the late Pleistocene humans have, as it were, joined forces with fire by learning to manipulate it.

Viewing the varying relationships between humans and fire as almost symbiotic yields many illuminating and even brilliant insights. Pyne is inclined, however, to press the metaphor too far, and to project human qualities to fire. His gift for powerful images leads to a tendency to let him-



Burning fields in the Black Forest. C. Rour's mid-19th century painting of peasants using long poles with iron hooks to move the flaming debris evenly over the ground.

As Pyne clearly indicates, human use of fire has always shown a dual character, symbolized by the torch and the hearth. The torch represents moveable fire, which can be used extensively for hunting game and clearing land. The hearth represents intensive fire use at one protected spot, for cooking or shaping tools and weapons. It is from the hearth that temple fires developed, such as the sacred Vestal fire of ancient Rome in which Pyne sees the archetypal form of European fire. He hardly mentions that the hearth also was the crucible of furnaces—of "Vulcanic fire," to use another allusion to the Roman pan-

J. G. GOLDHAMER PHOTO FROM VESTAL FIRE

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BROWSINGS

Animal Vocal Communication: A New Approach. Donald H. Owings and Eugene S. Morton. Cambridge University Press, Cambridge, 1998. 296 pp. \$64.95, £40. ISBN 0-521-32468-8.

Finding perspectives that emphasize information content inadequate, the authors argue that animals use signals to exploit the active-assessment processes of other individuals in self-interested efforts to manage the receivers' behavior.

Bacterial Biogeochemistry. The Ecophysiology of Mineral Cycling. T. Fenchel, G. M. King, and T. H. Blackburn. Academic Press, San Diego, CA, 1998. 317 pp. \$64.95. ISBN 0-12-103455-0.

Biological transformations of matter are dominated by bacterial activity. This book approaches the chemical environment of the biosphere from the perspective of physiological properties of prokaryotic organisms.

Getting Doctors to Listen. Ethics and Outcomes Data in Context. Philip J. Boyle, Ed. Georgetown University Press, Washington, DC, 1998. 244 pp. \$45, £34.95. ISBN 0-87840-654-9.

Participants in a project of the Hastings Center examine why physicians are surprisingly reluctant to follow guidelines for treating patients that are based on research data, and suggest means of reducing the doctors' objections.

Functional and Smart Materials. Structural Evolution and Structure Analysis. Z. L. Wang and Z. C. Kang. Plenum, New York, 1998. 340 pp. \$125. ISBN 0-306-45651-6.

The authors consider the atomic scale crystal structure and chemistry of oxides with physical and chemical properties that are sensitive to changes in the environment such as temperature, pressure, electric or magnetic fields, pH, and optical wavelength. They explain relationships among different structures and explore approaches to characterizing and synthesizing these important components for electronic devices.

Influential Passengers. Inherited Microorganisms and Arthropod Reproduction. Scott L. O'Neill, Ary A. Hoffmann, and John H. Werren, Eds. Oxford University Press, Oxford, 1997. 226 pp. \$95, £50. ISBN 0-198-57786-9. Paper, \$45, £22.95. ISBN 0-198-50173-0.

The six chapters in this book examine evolutionary and ecological implications of bacteria that can manipulate their host's reproduction. Topics discussed include sex reversal, sex-ratio distortion, and the possible use of these microbes to control disease-transmitting insects.

Photosynthesis. A Comprehensive Treatise. A. S. Raghavendra, Ed. Cambridge University Press, Cambridge, 1997. 394 pp. \$115, £70. ISBN 0-521-57000-X.

The international collection of authors presents a state-of-the-art overview of photosynthesis from the cellular and molecular biology of chloroplasts, through physiology and biochemistry, to ecological and applied aspects such as crop productivity, climate change, and biotechnology.

VIGNETTES

Reflections on The Ends of Fishes

Tuna

The bluefin tuna is clearly complete. Some say it is nearly finished. Scientists calculate that the bluefin population off the eastern seaboard of the United States and Canada has declined sharply since the 1970s, plummeting nearly 90 percent. They say reproduction is now very low. But commercial fishermen in New England—good fishermen and good people—say this is hogwash, that the fish are abundant, increasing in numbers. This debate is more than academic, because an adult bluefin may be worth more money to the person who can kill one than any other animal on the planet, elephants and rhinos included. Probing for the truth to this debate requires following the bluefin, and the bluefin's trail leads us in many directions. ... Most of all, the bluefin's trail leads through the looking glass of the ocean's surface, revealing that while the ocean may look the same as it has for millennia, it has changed, and changed greatly.

Salmon

...[E]fforts to restore, reestablish, or even just conserve salmon runs confront the preeminent big-money interests of the region. Not surprisingly, the prospect that people would resort to the Endangered Species Act to help balance the prevailing trend for salmon has spawned a great deal of, shall we say, anger, over the act itself.

The main problem with the Endangered Species Act and our normal way of thinking is that most attention and money go to saving the most at-risk populations. This is the highest-cost, highest-risk strategy. Waiting until that point, rather than cherishing and shepherding those in the best shape, helps ensure that both the best runs will eventually join the worst and that some of the worst will be lost. But human nature includes the strong tendency to remain in denial until things are undeniably bad. And the Endangered Species Act is fixated on extinction instead of abundance. So, crisis management of the region's salmon has begun.

Grouper

Groupers are a large family—three dozen species in the Pacific alone—of mostly tropical coral reef fishes. Many spawn intense aggregations at highly predictable times, places, and specific moon phases—behaviors have been shaped by evolution to maximize survival. But in an age in which books are given titles like *The End of Nature* and *The End of History*, I can tell you this: For many wild animals worth money (or standing in the way of money), our age is basically the end of evolution. The groupers' complex breeding behaviors bring them together in ways that, instead of continuing to maximize reproduction and survival, now mark them for easy elimination. Their own finely tuned evolution now betrays them. When fish from tens of miles in every direction gather in one consistent spot during a certain month's full moon, you can bet a plate of wrasse lips that someone on the deck of a boat is salivating about payday. The proof that these breeding colonies are supremely vulnerable to overfishing comes in the form of the formerly enormous, now demolished grouper populations throughout the world.

—Carl Safina

in *Song for the Blue Oceans. Encounters Along the World's Coasts and Beneath the Seas* (Holt, 1997)