encompass the major groups of benthic and pelagic groups of organisms commonly encountered on the bottom, along shore, and in the upper brackish estuaries of this immense tidal basin. The keys are essentially multiple-character in format, and the accompanying illustrations are clear and competently executed, many by artist Bromley; in some cases they are reproduced (with permission) from pertinent major reference works. Especially well done are the line illustrations for the 24 species of nudibranch mollusks recorded from eastern Canada and northern New England.

In a work of this size and scope, some errors and omissions are perhaps inevitable, partly because of the long "gestation time" of the book (commenced in 1979), all sections of which were apparently not uniformly "updated". Thus, within the Mollusca, the common salt marsh snails *Melampus bidentatus* and *Ovatella myosotis* have not been included, whereas the quahog, *Mercenaria mercenaria*, which does not occur naturally in the Basin, is illustrated. The polychaete taxonomy is especially out of date, the keys somewhat cumbersome to use, and the common species too sparsely illustrated.

Within the Crustacea, the recorded regional haustoriid amphipod is Acanthohaustorius spinosus (A. millsi is more southern and Haustorius canadensis occurs in the Gulf of St. Lawrence); the sandhopper, Talorchestia longicornis (not listed) is common on the sand beach at Kingsport; Gammarus annulatus is known from Sable Island but not from the Basin, and the genera Ericthonius and Gammarellus have recently been correctly placed in families Ischyroceridae and Gammarellidae, respectively. The oceanic goose barnacle Lepas is a highly unlikely drifter into the region. The authors have treated some pelagic or planktonic invertebrate groups, such as the copepods, ctenophores, and squids, but did not include the large pelagic medusae, *Aurelia* and *Cyanea*, which commonly wash up on the beaches. However, the plastic "loose-leaf" binding permits easy revision and updating of the contents. In future, the authors may wish to replace some of the taxonomic descriptive material (not really necessary because of the generally fine illustrations and keys) with brief information on the ecology, life history, behaviour and distribution on the species, and thus aid the user in locating the animal or plant species in the field. Despite the excellence of the illustrations of microstructure, the user would appreciate whole-organism sketches of the bryozoans (e.g. *Flustra*) as well. Glossaries of terms in the larger and more important groups would have been helpful.

This set of illustrated keys is really the first published comprehensive guide to the macro maritime biota of eastern Canada. Although it is designed to treat mainly the biota of Minas Basin, the guide applies reasonably well to most other boreal and temperate coastal marine subregions from the Gulf of St. Lawrence and Newfoundland to northern New England. The authors might have made greater use of existing regional reference material, especially the NOAA Technical Report series of the past decade on the Marine Flora and Fauna of the Northeastern United States. Students, fisheries biologists, marine ecologists, and informed beach-combers are likely to find this book invaluable and a standard regional reference work for some time to come. The authors and collaborators have made a good and useful start in fulfilling this important need, at a most reasonable price.

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## The Background of Ecology: Concept and Theory

By Robert P. McIntosh. 1985. Cambridge University Press, Cambridge. xiii + 383 pp. U.S. \$39.50.

If science were simply the collection of facts, there would be no need to worry about its history. But science is not like that, least of all ecology. There is no such thing as a "simple fact", and we cannot really understand the ideas of today without understanding the context in which they developed.

Parts of the history of ecology have been documented in articles by F. N. Egerton, McIntosh himself, and others. Donald Worster's book, *Nature's Economy*, is subtitled "The Roots of Ecology" but is in fact a history of environmental awareness and activism, not of science. The present work, then, is really the first book to tackle the history of ecology as a scientific discipline, at least in its Anglo-American manifestation.

The history is fascinating. Philosophers have discussed the relationship between humankind and nature for at least three millennia, so it is not difficult to find traces of ecology in the oldest documents. However, McIntosh makes a good case for ecology crystallizing as a self-conscious scientific discipline quite suddenly in the last decades of the nineteenth century. Since that time it has had a querulous, fragmented history, highlighted by multiple reinventions of the wheel (or of the ecological equivalent of the perpetual motion machine). More recently the name "ecology" has been linked with salvation of the world, revolutions in moral standards, and other, more bizarre causes. The historical perspective is clearly called for to help us understand how we got into this predicament.

McIntosh proceeds by exploring first several separate roots of modern ecology: limnology, marine ecology, terrestrial animal ecology (populations), and terrestrial plant ecology (communities). He then works forward in time to more recent phenomena such as systems theory, "big ecology" (an excellent discussion of IBP and its failures), and the environmental movement. These pieces overlap considerably, and since his descriptions are written more like self-contained journal articles than chapters of a book, there is some repetition. This is particularly noticeable with the topic of community, his specialty, which shows up many times. Since the story of Clements, Gleason, and friends is one of the most familiar historical episodes in ecology, the repetition is a bit bothersome. McIntosh also has the questionable habit, for a historian, of quoting extensively from secondary sources, a University of Toronto thesis by S. E. Kingsland, for example. Some of his references are almost impossible to track down as a result. On the other hand, his writing is full of humour, albeit humour so dry as to be almost invisible in short passages. He is helped in this respect by his subjects, the ecologists of the last hundred years, who, as a group, were more successful with their one-liners than with their theories.

From out of the thousands of details patterns emerge. Ecology has had a single dominant metatheory: the "balance of nature", with its aliases of superorganism, equilibrium, stability, homeostasis,

## **Environmental Groups in Politics**

By P. Lowe and J. Goyder. 1983. George Allen and Unwin, Boston. 208 pp., illus. Cloth U.S. \$30.00; paper U.S. \$13.95.

The environmental movement has grown over the last century to become a prominent sociopolitical phenomenon. Lowe and Goyder report that in Britain there are nearly one hundred national environmental groups and several thousand local ones. About 10 percent of the British adult population belongs to an environmental group. The influence of the environmental movement is not what one would expect given its size, which as a whole is larger than any British and so on. Yet, as Charles Elton said bluntly over fifty years ago, and as most serious ecologists have known full well, "the balance of nature does not exist." It is this confusion of paradigms that makes the superorganism so unsatisfactory and yet so indestructable as a theory. As McIntosh points out, "superorganisms are not easily killed by mere logic." It is the same paradigm confusion that causes the tension between ecology and environmentalism. Humans change the world, but does this make the species "unnatural"?

On the second page we are told that "ecology was not, and is not, a predictive science". This rather depressing outlook is supported repeatedly through the book. And yet, there is a missing element, an element that does not appear until the second last page. It is the experienced practitioners, the individual practising ecologists who work successfully to understand parts of the world. How they manage to do so, despite the theoretical uncertainties that surround them, is unclear. It would seem to be related to the fact that there is much more to theory than testable hypotheses and falsification, and that ecologists have had many useful organizing concepts if not predictive theories. This is a fine problem for philosophers of science as they move beyond physics. What is clear, however, is that the theoretical murk is commonly thicker than necessary because of a failure to learn from the past. With the arrival of this readable and sophisticated volume, any serious ecologist who continues to ignore the past has no excuse for neglecting a responsibility, and a pleasure.

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political party or trade union. Since the environmental movement is composed of groups which differ in social characteristics, the values they express, their historical origins, and subsequent pattern of development, their influence also varies. It is the diversity of the environmental movement and the impact on society and political decision-making that the authors focus on.

Two main themes are developed: the internal organization of environmental groups, and their external relations with social and political systems. The former is assessed in terms of how unity and internal authority are maintained, support engen-



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