

Book Reviews

Lotic Biology

The Ecology of Running Waters. H. B. N. HYNES. University of Toronto Press, Toronto, 1970. xxiv, 556 pp. + plates. \$25.

In the past, the textbook material on the ecology of running waters has usually been relegated to a single chapter in limnology texts, to superficial treatment in sewage engineering texts, and to a few volumes on the biology of polluted waters. Now for the first time the greatly scattered information on stream ecology has been brought together by a stream biologist with long and varied experience. Specific college and university courses in stream biology and ecology are now offered at perhaps no more than three or four campuses in the United States, but unquestionably the appearance of this book will produce a burgeoning of such courses, especially at senior and graduate levels. It is a companion volume to Hynes's *Biology of Polluted Waters*.

Since this is a new kind of book, readers and reviewers will impulsively and deliberately contrast it with counterpart volumes on limnology. For example, except for a concise review of longitudinal zonation of stream organisms, one finds no discussion of stream classification systems, in marked contrast to the emphasis on lake classification systems in limnology texts. Further, Hynes has given the chemical and physical aspects of lotic ecology only passing consideration (25 pages).

If this book has a special "theme" or emphasis, it is undoubtedly in the area of behavior and adaptation, notably in the seven chapters on composition, behavior, feeding, life histories, and ecological factors controlling benthic invertebrate populations. The chapter "Quantitative study of benthic invertebrates" contains a thorough critique of stream bottom sampling methods—a subject of considerable disagreement among stream ecologists. In general, Hynes is skeptical about correlations between standing crops, species

occurrence, and water chemistry. He is also pessimistic about the recovery of bottom faunas after spates—a further point of disagreement with some other investigators. An abundant recent international literature is critically reviewed in the chapter "Effects of downstream movements of organisms on the benthos." Chapters on the biology of attached algae, higher plants, and plankton are well balanced and of equal length; there are no long taxonomic lists.

Fishes are treated in four chapters on fishes of running waters, ecological factors affecting fishes, movements and breeding, and feeding habits. These chapters are a general consideration of worldwide literature, however, and there is no special emphasis or reliance on the extensive North American literature.

Two unexpected but welcome chapters are "Effects of man on watercourses" (not including pollution) and "Special habitats" (springs, intermittent streams, very cold streams, hyporheic zone, psammon, and the madicolous habitat).

A summarizing chapter, "The ecosystem," resembles a long essay in which the fragmentary material on trophic relationships in streams is brought together. The emphasis clearly departs from some of the unintentional implied correlations between standing crop and productivity scattered throughout some of the other chapters.

In view of the abundance of generic and species names in this book, the author has attained added polish by the rarity of typographical errors. The bibliography of 1500 entries is especially useful because each entry is followed by the number of the page or pages in the text where the item is cited.

We would wish for more tables, figures, and quantitative data, as well as material on natural eutrophication and shoreline development and microzoans of the substrate, greater emphasis on trout streams, and a realistic discus-

sion of the *Eichhornia* and *Trapa* problems in the southern and eastern states.

Libraries and aquatic ecologists should quickly exhaust the first printing of this essential reference and textbook.

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Two Research Strategies

The Community as an Epidemiologic Laboratory. A Casebook of Community Studies. IRVING I. KESSLER and MORTON L. LEVIN, Eds. Johns Hopkins Press, Baltimore, 1970. xiv, 326 pp., illus. \$10.

Studying the distribution of diseases in human populations leads to insights into the ways in which man can reduce disease frequency by modifying his interactions with the social, biological, and physical environment. This, in brief, is the task of the epidemiologists. For example, a series of *ad hoc* epidemiological studies during the last two decades in various populations have shown beyond any reasonable doubt that cigarette smokers have a higher risk of dying of coronary heart disease and an enormously higher risk of dying of lung cancer than do other people. Epidemiologists and biostatisticians have developed the art and theory of conducting such "hit and run" studies to so high a level that a great deal of their training focuses on the transmission of that art and theory. Many questions have been answered by studies of that kind.

But another set of questions requires longitudinal community studies, a different relationship of the investigators to the population under study. If one is interested in understanding the interrelations between living conditions and disease prevalence as they affect the distribution of medical care, one is more inclined to seek out a sample population in which these three sets of phenomena can be repeatedly studied and where the investigators can examine their interrelations in an entire community. Because of such interests, Edgar Sydenstricker settled into Hagerstown, Maryland, and developed what might be called the first "population laboratory" for studies of disease ecology (see E. Sydenstricker, *Environment and Disease*, McGraw-Hill, 1933). This community-laboratory approach led to the technology of morbidity surveys that produced the first national health surveys of the Commit-