

## BOOK REVIEWS

**The Audio-Tutorial Approach to Learning.** (Third Edition) *S. N. Postlethwaite, J. Novak, and H. T. Murray, Jr.* Burgess Publishing Company, Minneapolis, Minnesota. 1972. ix+184 p. \$5.50.

The senior author, Dr. Sam Postlethwaite, originally introduced audio-taped teaching units only to provide material supplementary to the conventionally taught introductory botany course at Purdue University in 1961. These units were so popular that he felt warranted to put the entire story line of the course into this integrated sequence of "programmed learning experiences": the Audio-Tutorial system. The first edition of this book came out in 1965 as "The Intergrated Approach to Teaching Botany." In spite of the title change adopted for the second edition, there is, in this third edition, only token expansion of the A-T idea beyond its use in teaching elementary botany. Two chapters have been added, VI and VII, one on "Minicourses," which proposes to extend the potential for individualization of subject matter, and the other on Dr. Novak's development of A-T methods for elementary school science instruction.

This book is not so much a manual on how to set up an A-T course as it is a narrative description of how Postlethwaite and his colleagues did it at Purdue. For example they do not recommend that others use the Audio Tutorial Systems Model SC-1 tape deck, but they comment that "after thousands of hours' use theirs are still functioning in a . . . reliable manner". Throughout the story, lip service is given the standard idols of modern mass instruction: individualization, measurable objectives, and modular scheduling; and the straw men of rote learning and rigid curricula are at least nominally held to scorn. However there is no clear exposition of fundamental philosophy, and very little concern for putting the parts together by any rationale other than that it worked at Purdue. The last 50 pages are devoted to Appendices A through H. Appendix E, for example, deals with "Problems and Pitfalls in Audio-Tutorial Methods." There is no index.

There are a number of undeniable advantages to the A-T system, especially when applied to a recitation of the more traditional botanical concepts. It does allow a slow student to play the tape over and over, as often as he feels is necessary to learn it, and some kinds of learning undoubtedly are enhanced by repetition. Conversely, a quick student can skim through a tape almost as easily as he might skim a written text. Further advantages are claimed for putting the course message across in several ways: in a text, by class discussion, on audio tape, and indeed, by person-to-person conversation. The A-T tapes, by carrying the main burden of the information transfer, are supposed to give the instructors more time for informal student contacts. And certainly a primary inspiration to the authors seems to be their confidence that students overwhelmingly prefer the A-T system. Their assertion that quizzes and exams are fundamentally important instruments for student motivation suggests, nevertheless, that there may be reservations in their confidence.

On the whole, the authors' claim that A-T is one of the "breakthrough" events in history, comparable to the invention of the printing press or television, is somewhat less than convincing.

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**Soil Micro-organisms.** *T. R. G. Gray and S. T. Williams.* Hafner Publishing Co., New York. 1971. viii+240 p., 9 pls. \$9.95.

Most ecologists know little about the soil and it is difficult to know where to turn for information in an unfamiliar field. I do not claim the ability to judge the book as a contribution to microbiology, but I can recommend it as a book that addresses the questions an ecologist is likely to ask. How much active biomass is present in soils? What are the energy sources and the rates of consumption? How does the activity of soil microbes affect or alter soil structure? And, finally, what are the relations with other trophic levels?

There are no precise answers to these questions and the authors show why this is the case as they discuss clearly and concisely the techniques of measurement. Techniques are explained without losing track of the general problems. Thus, one is able to appreciate the experimental difficulties that generate a wide range of values and interpretations. The book is an ideal source for the general ecologist and the 579 references (up to 1968, generally) provide ready access to the literature and a feeling of confidence in the book.

Though this is only a paperback, a set of 39 clear black-and-white photographs bound in the middle of the book help to visualize the sorts of micro-organisms discussed: viruses, bacteria, actinomycetes, algae, and fungi. The text throughout is clearly expressed, despite the complexities of the biology, the soil-forming processes, the organic chemistry, and the even greater complexities of their interactions. The authors, who are Lecturers in Botany at The University of Liverpool, communicate effectively and meaningfully, and also authoritatively. This, together with the reasonable price, make this book a very useful source for all concerned with soil development, plant growth, animal life, and their ecologic interaction within the natural environment.

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