is that "The student is expected to recognize the need for information, to become acquainted with the biochemical literature, and to search out his own answers." To this end, he is given a bit of help; a few references are appended to each section, and occasionally in notes throughout the text he is urged to refer to published papers: "If this does not work, analysis of the precipitate by the method of Robinson and Hogben [*J. Biol. Chem.* **135**, 707 (1940)] should be investigated."

It is obvious that the author believes in self-teaching. One wonders, however, if this is not going too far. There are possible dangers involved when a novice undertakes to use (for instance) bacteria or radioisotopes as tools. These dangers are not emphasized in the book. Instead, in the case of experiments involving the use of carbon-14, the attitude is surprisingly nonchalant; the student is merely admonished as follows: "If your hands are contaminated, use soap and water. Handling a planchet with contaminated hands usually leads to a contaminated counter, and whoever contaminates a gas-flow counter is obligated to clean it."

The overall impression given by the book is not favorable. The author indicates what biochemical techniques he considers important but he does not provide the necessary details so that a student can proceed without much help.

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Index to Bacteria

Index Bergeyana (Robert E. Buchanan, John G. Holt, and Erwin F. Lessel, Jr., Eds. Williams and Wilkins, Baltimore, 1966. 1486 pp., illus. $25) consists of three sections: an introduction; an alphabetical index to over 28,900 names of taxa and specific epithets for bacteria, which have been retrieved from a long and careful search of the literature; and a bibliography of about 6800 references.

The *Index* will be of great value to every scientist who has problems relating to the naming of bacteria, and it is a fitting companion volume to *Bergey's Manual of Determinative Bacteriology*. Answers may be found in the book to many perplexing nomenclatural questions such as the following: How many and what kinds of names have been proposed for bacteria? By whom, when, and where was each taxon published? What species has been designated as the type species of each genus? What names of taxa of bacteria have been conserved by international agreement? What names have been rejected as having no standing under the rules of the *International Code of Nomenclature of the Bacteria*? What names should be avoided in naming newly described taxa because of prior use? This is a great reference book, and it should be readily available to every microbiologist.

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Man in His Environment

The excellent collection of articles brought together by Jack B. Bresler in **Human Ecology: Collected Readings** (Addison-Wesley, Reading, Mass., 1966. 480 pp., illus. $9.75) ranges in coverage from the history of the earth's climate, the ecology of prehistoric man, and land and early food production to man in space, and includes discussion of contemporary problems such as population and stress and radiation and air pollution. A particularly interesting group of articles covers the controversy over the application of Bergman's and Allen's rules to human evolution and serves to illustrate the tentative nature of theory in human ecology, just as the entire collection demonstrates the cross-disciplinary nature of this growing subject.

In line with current controversies, I should have liked to see Ferdon's critique of Meggers accompanying her "Environmental limitations on the development of culture." In addition, Livingstone's classic paper on sickle-cell anemia in West Africa would have enhanced the section on land and disease patterns. A synthesizing introduction would have been welcome, for some kind of overview would have been advantageous. The editor has thoughtfully left the bibliography to each article intact, a practice becoming rare in such collections. In addition, he has added helpful lists of supplementary reading at the beginning of each section.

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Inorganic Substitution Reaction

Cooper H. Langford and Harry B. Gray are two of the most productive young workers in the exciting and expanding field of inorganic reaction mechanics. They have combined their talents in a small but comprehensive volume entitled **Ligand Substitution Processes** (Benjamin, New York, 1965. 119 pp., illus. $8.50). They have done a remarkable job of summing up in a few pages the extent of our considerable knowledge of one of chemistry's most fundamental reactions: the generalized acid-base substitution reaction for the case when the generalized acid is a metal ion.

The authors have not been content to repeat the ideas of others. Instead they present an entire new classification scheme for substitution reactions. They suggest three categories of mechanism, distinguishable operationally by kinetic tests.

1) Dissociative (D): intermediate of reduced coordination number, which may be detected by its selective reactivity.

2) Associative (A): intermediate of increased coordination number formed, which may be detected by departure of the rate equation from simple second-order.

3) Interchange (I): no kinetically detectable intermediates. This category is further subdivided into I_a, where the rate is sensitive to the nature of the entering group, and I_d, where it is not.

The new classification bears much resemblance to the older Hughes-Ingold system for organic substitution reactions. Thus we can identify D with S_N1 (lim), A with S_N2 (lim), I_a with S_N2, and I_d with S_N1. Nevertheless, the new scheme has shades of meaning which make it more appropriate for inorganic systems, particularly metal complexes.

There are only three chapters, including an introduction which sets up the new mechanistic classification. The other two chapters are on square planar substitution (Gray's specialty) and octahedral substitution (Langford's specialty). An attempt is made to use molecular orbital theory as a guide whenever possible. Although this meets with mixed success, the overall result is novel and stimulating.

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