tion, structure proof, synthesis, resolution, methods of racemization, infrared spectra of the individual amino acids are treated in 21 different chapters of volume 3. Similarly, 11 chapters are concerned with the preparation of amino acids not known to be bound in proteins of mammalian tissue. The latter include aliphatic straight-chain monoaminomonocarboxylic, aminopolycarboxylic, diaminomonocarboxylic, diaminodicarboxylic, imino, α-alkyl amino, (β)-branched amino, α-amino-ω-hydroxy, sulfur-containing amino, ring-substituted α-amino, and N-alkylated amino acids. These chapters provide an exhaustive and authoritative survey of the several aspects of the amino acids mentioned.

In this review I have attempted to indicate briefly something of the subject matter and the thoroughness of its presentation. The more extensive and exhaustive the coverage of an important subject, the more likely is a short review to appear superficial and even trivial. However this may be in the present instance, it seems clear that these volumes will occupy an important place as a reference source for many specialists and for biochemists and biologists in general. The authors state in the preface that they "have been entranced by the spectacle of the many and diverse phenomena" associated with the behavior, properties, and biological duties performed by the α-amino acids. Biochemists and many others will benefit immeasurably because the authors were not only entranced but were highly discerning, skillful, and thorough in recording their extensive observations.

H. S. LORING
Department of Chemistry,
Stanford University

The Physico-chemical Constants of Binary Systems in Concentrated Solutions. vol. 3, *Systems with Metallic Compounds.* xiii + 1322 pp. $36. vol. 4, *Systems with Inorganic + Compounds* (excepting metallic derivations). xi + 1332 pp. $39. Jean Timmermans. Interscience, New York, 1960.

With the appearance of volumes 3 and 4, this tabulation of the physical constants of concentrated solutions of two substances is complete. Volumes 1 and 2, which cover systems of two organic compounds, were reviewed in *Science* [**131**, 97 (1960)]. Volume 3 covers systems of two inorganic compounds, and volume 4 contains data on systems of one organic plus one inorganic compound, the references to the literature, and a 230-page formula index for the whole set.

The survey is noncritical and appears to cover the literature up to 1956. The bibliography is easy to use once the system of interest has been located in the tables. Finding a system is no easy task, however, for the only index provided is a formula index, and it is hopelessly inadequate. For example, under C_2H_6O appears the entry "ethyl alcohol" followed simply by about 200 page numbers that give no clue as to the nature of the second component. Under such circumstances the reader is practically forced to a page-by-page search through one or more of the thousand-odd page volumes to find specific data, if indeed they are present at all. Although the over-all organization ameliorates this situation somewhat, by no means do the volumes comprise a handy reference work.

While there is no doubt that this set will prove useful to specialists concerned with the properties of binary systems, poor indexing and the failure to evaluate discordant sets of data greatly diminish the value of the work for general reference purposes.

RICHARD H. EASTMAN
Department of Chemistry,
Stanford University

Radiation Protection and Recovery. Alexander Hollaender, Ed. Pergamon, New York, 1960. v + 392 pp. Illus. $12.50.

Many efforts have been made to develop effective chemical and physiological-biological means to counteract the damaging effects of ionizing radiations. Often the situation appeared confused, the possibilities limited, practical applications doubtful. However, persistent work in the field has changed this picture. Today the multiplicity of approaches appears, in retrospect, more uniform than anticipated, and in the proper arrangement of the scientific facts an impressive inventory of the present state of the art can be presented. This is exactly what Hollaender does. The book's 12 chapters cover the protection of macromolecules and different biological systems, the experimental treatment of acute whole-body radiation injury in mammals, recovery phenomena, and photo-reactivation. The stimulation given to biology and medicine—for example, Lorenz's classical bone marrow experiment and its implications to tissue transplantation techniques, to immunological problems and related phenomena—becomes obvious.

Historical remarks, cleverly inserted, vivify the presentation; their value might have been increased by more detailed consultation of the reports of the Atomic Energy Commission and other governmental agencies—for example the protective action of cysteine on the synthesis of desoxyribonucleic acid in the intestinal mucosa of x-irradiated rats was reported in 1952, long before rediscovery of the effect in 1958. But perhaps it is such facts that make reading the book so interesting. The volume stimulates and it challenges. The pioneer in the field starts to revise old and to look for new ideas and interpretations; the newcomer accepts gratefully the tremendous background information presented by the different contributions and so well selected by the editor.

A. T. KREBS
Department of Biology,
University of Louisville

Handbook of Microbiology. Morris B. Jacobs and Maurice J. Gerstein. Van Nostrand, Princeton, N.J., 1960. x + 322 pp. Illus. $8.50.

Compiled from contemporary literature and arranged in 38 alphabetically organized, so-called "tables," this book provides data for professional work in microbiology. Although it attempts a broad coverage of bacteriology, there is little on viruses, and protozoology per se is omitted. The 150-page, first table, which describes 160 species of bacteria, leaves out several important species—for example, *Salmonella paratyphi* and *Haemophilus ducreyi*—and includes a few of slight importance—for example, *Spirillum volutans* and *Pseudomonas ovalis.* Synonyms should have been included, and space could have been saved by a different arrangement: more than 30 lines are used for the fermentation reactions of *Acetobacter aceti.*

The classes, orders, suborders, families, and genera of bacteria, rickettsia, and viruses according to *Bergey's Manual* (1957) are listed, but I see no need for including Krassilnikov's classification (1949). Table 6 allots 21