These two ideas account for the expression "association-induction hypothesis" appearing in the title. The fundamental tendency of the work is to discount the ultimate utility of theories involving the pumping of all material across semipermeable membranes and to stress the importance of the interaction of fixed charges.

Though the presentation is clear and explicit, it demands for its understanding considerable background in biochemistry and the fundamentals of thermodynamics and statistical mechanics. Roughly the first quarter of the book is devoted to an exposition of the fundamental theory and the remainder to its application to numerous biological phenomena. The treatise is well illustrated by a large number of excellent figures, graphs, and charts, and there is an elaborate bibliography as well as a glossary of terms. The book will undoubtedly receive close attention from biophysicists and biochemists not only for its basic thesis, which will probably arouse much discussion, but also for its wealth of biological data.

Color in Business, Science, and Industry (2nd ed.). By Deane B. Judd and Günter Wyszecki. 500 pp. Wiley, New York, 1963. $15.00. *Reviewed by W. T. Wintringham, Bell Telephone Laboratories, Incorporated.*

THIS reviewer opens a second edition with a greater sense of anticipation than a first edition. The questions in his mind are: Have the revisions of the earlier text improved the book; have the minor aggravations in the first edition been carried over to the second; and have the most recent advances in the field been incorporated in the second edition? In the case of *Color in Business, Science, and Industry*, the answers to these questions in order are: yes; yes and no; and yes.

One's first impression of the text of this edition is that it is familiar and little changed from that of the earlier edition. This impression is heightened when it is found that paragraphs and whole sections have been transferred without change to the new edition. But, it suddenly occurs to the reader that the difficult parts of the text have disappeared. Through careful rewriting of the obscure passages, and by minor changes of the order of presentation, this edition is substantially more readable than was its predecessor. Paralleling this improvement of the text, the illustrations have been redrawn and the more complicated ones simplified.

One eminent reviewer of the first edition (W. E. K. Middleton in the *Journal of the Optical Society of America*) suggested that the content of the book did not justify the inclusion of the word *Science* in the title; and he noted that the OSA terminology had been used everywhere in the text except in the discussions of the Kubelka-Munk analysis of layers of colorants. The authors appear to have considered and rejected these criticisms.

This reviewer is disturbed to find that titles have not been added for Tables A, B, and C of the Ap-

pendix in this new edition. He continues to be amused by the authors' complaint that the use of the word "colorimetry" by the chemists is improper. (The authors are correct from an etymological point of view, but historical usage is in favor of the chemist.)

Senior author Judd mentions that this revision of *Color in Business, Science, and Industry* could not have been prepared had not junior author Wyszecki been able to join him in writing the second edition. But the styles of the old and of the new parts of the text are so nearly identical that it is impossible to say that Dr. Judd wrote this, or that Dr. Wyszecki wrote that—a most remarkable writing team.

In bringing this book up to date, material has been included on color-matching functions for 10-degree fields; the colorimetry of fluorescent materials; metrics of uniform color-space; dark and light and chromatic adaptation; object-color perception in complicated scenes; color rendering of light sources; and color harmony. The treatment of the topics included in the first edition has been expanded to cover the more significant of recent developments.

This reviewer makes the unqualified recommendation that the second edition of *Color in Business, Science, and Industry* be added to the library of everyone interested in color, its measurement, and its applications.

Differential-Difference Equations. By Richard Bellman and Kenneth L. Cooke. Vol. 6, Mathematics in Science and Engineering, edited by Richard Bellman. 462 pp. Academic, New York, 1963. $13.75. *Reviewed by J. Gillis, Weizmann Institute of Science, Israel.*

AMONG the proliferating scientific literature of our day, we occasionally find a new book which says something better than it has been said before. But it is rarely indeed that we come across a book which actually opens up a new subject. Dr. Bellman effectively does just that, with the first broad treatment ever published of differential-difference equations.

The presentation is clear and lucid, while the examples are chosen from a wide range of mathematical literature and take us, in many cases, up to the frontiers of what is known. It is claimed that "only slight acquaintance with the theory of Laplace transforms and differential equations is required", but this seems disingenuous to the reviewer, as such assertions so often are. It is formally true, but since the book is, by its entire tone, addressed to mathematicians, the claim really adds very little to the situation.

The material represents a reasonable balance of methods of solution, existence questions, asymptotic behavior of solutions, and problems of stability; the whole seasoned rather liberally with items of fundamental mathematics. It might have been even more useful if the author had included a chapter on numerical methods of solution. Perhaps the omission will be made good in a later edition. The stability discussion includes nonlinear equations, where it leans heavily on Poincaré-Liapounov ideas. It is interesting that the