

captured by R. L. Gregory in **Eye and Brain: The Psychology of Seeing** (McGraw-Hill, New York, 1966. 254 pp., illus. Paper, \$2.45). Gregory treats most of the biological foundations for seeing in his five early chapters, and that leaves him eight chapters for dealing with the complex problems of color vision, seeing movement, inadequacies and errors of seeing, how the artist through history learned to portray visual reality, and other fascinating principles and applications, including in the final chapter a discussion of why vision is likely to pose problems in the exploration of extraterrestrial space.

The two longest chapters of this book deal with illusions and with the question: Do we have to learn how to see? Since the answer to this question is both "no" and "yes," Gregory obviously has to rephrase it into a series of additional questions that take roughly the form: Does the individual (animal, child, adult) require certain experiences before his vision serves him in a given task, appreciation, or perception? Clearly the evidence is not yet all in, says Gregory, and the pursuit of it is one of the current areas of active investigation. (The authors of the book and of this review are among the participants.) Gregory is very effective in his review of conclusions that are drawn from studies of prism adaptation and recovery from congenital cataract. He is equally careful about generalizing from animal to infant vision or from visual behavior in the human infant to the much more highly discriminating older child or adult.

*Eye and Brain* is a part of the World University Library series, designed "to

provide authoritative introductory books for university students which will be of interest also to the general reader," and its format and style of writing are appropriate to this purpose. It is exceedingly well illustrated, with color used effectively both to illustrate principles in color vision and to add realism to the photographs and diagrams of the eye and the brain. Gregory has referred to important sources both generously and in a most useful chapter organization. The bibliography is briefly annotated, and contains original as well as secondary sources suitable for further reading by student or general reader. Even the expert will find challenges in some of the restatements and documentations that Gregory provides on lively issues.

As an attempt to encompass much in relatively few pages, the book is highly successful, although sometimes the reader has to bring knowledge or educated guesses to bear on some paragraphs or quotations. For example, it is not clear why Polyak is saying in one of the intriguing quotations that 100 microns correspond to 20 feet or one-third of a degree of arc, and the curious reader must search the original for Polyak's analogy. Some of the references brought into the text are not to be found in the bibliography, or, as in the case of Hess's study of prism displacement in the chick, are attributed to the wrong author. But such errors are few enough not to mar seriously this exceptionally broad and appealing introduction to current knowledge.

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such as the uncertainty relations (section 16), tunnel effect (section 97), and manybody problems. These discussions are clear and unique. Also the explanations of the classical limit ( $\hbar \rightarrow 0$ ), uncertainty relations between energy and time, and Pauli matrices would help beginning students better than most other textbooks.

As a textbook for beginners, however, the book has a few drawbacks in addition to the fact that some materials are old: There are no exercise problems, and some definitions and notations are inconvenient. As an example of the last point: the author defines the spherical harmonics in the same way as Schiff did in his textbook. The definition differs from that given in Condon and Shortley, Landau and Lifshitz, Messiah, and most of the other standard books. Another example is that the book uses black letters for operators and matrices but not for vectors. Also I do not understand why the bracket notation is not used for the commutators. (Such notation is used only for commutators with the Hamiltonian.) If such points are supplemented by other books or by instructors, this book can be a good textbook in the beginning quantum mechanics course.

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## Methods in Biochemistry

**Biochemistry Laboratory Techniques** (Wiley, New York, 1966. 177 pp., illus. \$5.95), by Sterling Chaykin, was intended as a laboratory manual for beginning graduate students. It was, it is said, designed to provide "a basic working knowledge of a wide variety of laboratory techniques currently in use in biochemical research." Indeed, it does touch on buffers, methods of protein determination, preparation and properties of yeast alcohol dehydrogenase, the isolation of rabbit muscle aldolase, Sephadex in gel filtration, criteria of protein purity, structure of aldolase, radioisotopes, characterization of glycogen, glycolysis, enzymology of polysaccharide biosynthesis, oxidative phosphorylation, bacterial genetics, and glass blowing. However, it seems to do little more than touch on these subjects; procedures are only sketched in, and the discussions of principles are meager. The reason given for this

## Blokhintsev's Textbook in Translation

Apparently D. I. Blokhintsev's classic Russian textbook, first published in 1944 during the days of Stalin, has not been much revised even in the fourth edition from which the present English translation, **Quantum Mechanics** (Reidel, Dordrecht; Gordon and Breach, New York, 1964. 551 pp., illus. \$17.50), is made. The author restricts himself to non-relativistic theories, but still could do better by discussing the Wigner symbols, nuclear shell models, Hartree-Fock method, and such developments that took place after "the Copenhagen epoch." In fact the main

aim of the book seems to be to emphasize the materialistic view in contrast to the idealistic or positivistic view taken by "the bourgeois physicists" in "capitalistic countries." In looking at the references in this book it is amusing to find Engels next to Einstein and Lenin between Landau and Lorentz. The age of the book can also be seen in the references by finding older editions of Beth's and Heitler's books, for example. Such philosophical attitude, on the other hand, makes the book strong and valuable in discussing the physical meaning of some fundamental points