cover vectors and vector mechanics; and the remainder of the text deals with the subjects that are now quite standard in a beginning course on celestial mechanics: the two-, three-, and n-body problems, properties of solid and fluid bodies, perturbations, the motion of the moon, and the determination of orbits. In addition, there is a worthwhile chapter on numerical procedures and errors, which students, subjected to the rigors of lengthy calculation for the first time, should find most valuable.

Danby has a very lucid and entertaining style of writing which should soon make this text a favorite of astronomy instructors in many universities and colleges. Throughout the book there are numerous problems and examples and at its end there are handy appendices and an adequate index.

Although this text is not intended to be the successor to Moulton's classic, it undoubtedly will, in future years, be seen on many reference shelves. After comparing it with Moulton's book, I find *Fundamentals of Celestial Mechanics* a more practical, more humanely written treatise that will serve as a valuable text in many courses.

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Surveys of Pharmacology

Progress in Medicinal Chemistry. vol. 1. G. P. Ellis and G. B. West, Eds. Butterworth, Washington, D.C., 1961. ix + 262 pp. Illus. $11.25.

Advances in Pharmacology. vol. 1. Silvio Garattini and Parkhurst A. Shore, Eds. Academic Press, New York, 1962. xi + 474 pp. Illus. $13.

For many years a serious shortage existed in the literature pertaining to pharmacology, but suddenly the void is being filled at an exceedingly rapid rate. New books, journals, and compendia appear so frequently that it now becomes necessary to consider whether each new progress, advance, or whatever, actually has anything new to offer or is merely a duplication. Each of the books reviewed here is the first volume of a new series. I do not believe either has a counterpart in the existing literature.

Progress in Medicinal Chemistry is written for organic chemists and biochemists whose interests center on the pharmacological testing of compounds. Pharmacologists may be interested in the techniques by which new compounds are tested as potential drugs. Six topics are covered in some detail: pharmacological screening tests, hypotensive agents, tranquilizers, diuretic drugs, oral hypoglycemic drugs, and antifungal agents. In each instance the need for a particular type of therapy is discussed first, and this is followed by a brief description of the physiology of the organ under consideration and how its function may be modified by a drug. Although this section is, at times, too brief, it still may help the chemist understand the apparent mechanism of the drug's action. Some chapters are enhanced by biochemical explanations of the mechanism of action.

Each chapter includes excellent coverage of the drugs that have been found clinically useful. The side effects of some of the drugs are noted; in view of the present-day concern, this section could well be expanded in future volumes. An extensive bibliography completes each chapter.

Medicinal chemists are quite often concerned with the synthesis of new compounds as potential drugs, but authoritative references describing the biological tests to which these compounds must be subjected are scattered in various journals and, thus, are hard to find. This need is well answered in the *Progress* series.

Advances in Pharmacology, produced under the guidance of an international board of editors (a virtual "who's who" in the field) is written for advanced students and active workers alike. Of its eight chapters, four deal with drugs as related to hyperlipidemia, hypertension, mental illness, and anticoagulation; three, with general topics—drug metabolism, the binding of amines to tissues, and the effect of naturally occurring amines on the gastrointestinal tract—and the introductory chapter, with a new interpretation of the adrenergic nerve fiber. Each is a complete unit, with adequate charts, formulas, and tables. Particularly useful are the excellent outlines preceding each discussion and the remarkably up-to-date references.

The appearance of *Advances* will at once raise the question, "How does this series compare with the *Annual Review of Pharmacology?*" [reviewed in *Science* **137**, 663 (1962)]. They are different types of series, and can certainly supplement one another. *Annual Reviews* covers a topic over a finite span of years. *Advances* covers a single topic in depth. That the two series are in no way in competition can be seen from a detailed comparison of their tables of contents: *Advances* overlaps the first two volumes of the *Reviews* in only two short sections. A comparison of the references cited again shows that the overlap is slight. In fact, the editor of one is writing a review for the other.

Both *Progress in Medicinal Chemistry* and *Advances in Pharmacology* are well printed and quite free of typographical errors. The formulas are easy to read, and no blurred tracings confuse the issue. I recommend both highly for the pharmacologist, and the former especially for the chemist.

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Personality and Perception

Psychological Differentiation. Studies of development. Herman A. Witkin *et al.* Wiley, New York, 1962. xii + 418 pp. Illus. $7.95.

Ten years ago, Witkin and his colleagues hypothesized that the extent to which an individual can separate conflicting perceptual cues in laboratory test situations is pervasively related to a variety of personality characteristics. The two extremes of this broad dimension were called field-dependence and field-independence. Field-dependent persons were those who could not tell which way was straight up in orientation tests with misleading cues. Although the broad outline of Witkin's general theory was well supported by the empirical evidence presented in his first book, *Personality Through Perception*, the specific claims of high correlations between field dependence and personality traits proved sufficiently controversial to generate prolonged debate and scores of new investigations. Highly cognizant of the criticisms leveled at his earlier work, Witkin has now done a masterful job of mustering support for a slightly altered thesis, which he presents in this book.

Witkin places major emphasis on what he calls the differentiation hypoth-

esis, which, in oversimplified form, states that as the individual develops he moves from a global way of experiencing to more analytical approaches. Indicators of differentiation include a tendency for the world to be experienced as analyzed and structured, an articulated body concept and sense of separate identity reflecting a differentiated self, and specialized structured defenses and controls. Field dependence is seen as the perpetual component of the more general cognitive dimension, which is best described as analytical versus global approach, or as the ability to overcome an embedded context.

Most of the book is devoted to a painstaking review of recent investigations dealing with correlates of perceptual tests central to Witkin's work, such as the Rod and Frame Test, the Body Adjustment Test, and the Embedded Figures Test. Skillfully woven into the survey is a series of studies by Witkin and his associates, dealing with three major problems growing out of the general hypothesis: (i) the degree of individual self-consistency in psychological differentiation across a wide variety of perceptual, cognitive and personality variables; (ii) the extent to which early life experiences determine later differentiation; and (iii) the stability of individual patterns of functioning during development and in adulthood.

Several hundred subjects, ranging in age from six to seventeen years, were given the basic perceptual battery, some of them repeatedly over a number of years. The methods of personality assessment ranged from the Rorschach and Draw-A-Person techniques to detailed interviews and family case studies. Striking relationships were found consistently between the perceptual index of field dependency and clinical ratings of differentiation based upon the personality data. Most impressive of all, when one considers the nature of the task, is the high relationship between the perceptual index and ratings of differentiation, based on early childhood experiences and parental attitudes obtained from interviews with the mothers—correlations of .82, .85, and .65 for three groups of boys. The highest relationships were always between clinical ratings and the perceptual index; this suggests the possibility that other subjective factors or unknown variables may influence the outcome.

Although these results will hardly stand unchallenged because of their controversial nature, they cannot be lightly dismissed. Witkin has taken unusual precautions to safeguard against contamination across different techniques of assessment and to check the reliability of his measures. His studies cover a wide age range, include both sexes, and employ multivariate methods to pin down the factorial meaning of concepts. Initial findings have been cross-validated on independent samples to check their stability, and the relevant literature has been painstakingly reviewed to demonstrate the general nature of the phenomena under study. The net result should be a highly significant impact upon current theory and research dealing with the developmental aspects of perception and personality.

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International Summer Course

Fundamental Problems in Statistical Mechanics. Proceedings of the 1961 summer course. Compiled by E. G. D. Cohen. North-Holland, Amsterdam; Interscience (Wiley), New York, 1962. xxi + 249 pp. Illus. $7.50.

This excellent volume provides an account of the lectures given during the NUFFIC (Netherlands Universities Foundation for International Cooperation) Summer Course in Science, which was held at Nijenrode Castle during the summer of 1961. All of the regular lectures, with the exception of G. E. Uhlenbeck's lectures on the theory of condensation are included, as is E. W. Montroll's seminar talk on the integral equations of statistical mechanics.

Most of the lecturers prepared their own notes for publication, but in some cases the published material was put together from notes taken by participants. Cohen, who compiled the volume, asks the reader's indulgence, because English is not the native language of any of the contributors except Montroll. No indulgence is necessary.

Throughout the lectures one finds strong emphasis on the relationship between the fundamental, exact, microscopic, reversible laws and the approximate, macroscopic, irreversible laws. The additional assumptions required to go from the former to the latter are discussed. In the words of N. G. Van Kampen, ". . . there cannot be a rigorous mathematical derivation of the macroscopic equations from the microscopic ones. Some additional information or assumption is indispensable. One cannot escape from this fact by any amount of mathematical funambulism. My policy will be to make these additional assumptions explicit rather than to disguise them."

Although each lecturer's contribution is self-contained, the general introduction, by B. R. A. Nijboer, is quite worthwhile, and it sets the tone for the lectures that follow. The topics covered and the lecturers are fluctuations, stochastic processes, and Brownian motion (H. Wergeland); liquid helium (K. Huang); many particle aspects of the Fermi gas (N. M. Hugenholtz); the Boltzmann equation and its generalization to higher densities (E. G. D. Cohen); master equation and approach to equilibrium for quantum systems (L. Van Hove); fundamental problems in statistical mechanics of irreversible processes (N. G. Van Kampen); statistical considerations on the basis of nonequilibrium thermodynamics (P. Mazur); and some remarks on the integral equations of statistical mechanics (Elliott W. Montroll).

The printing is quite readable in this inexpensive volume. The few misprints and omissions are not serious. There is no general index, but the table of contents is quite detailed. I recommend this work to students and experts alike.

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Disorganized and Abbreviated

Introduction to Electron Microscopy. Saul Wischnitzer. Pergamon, New York, 1962. 143 pp. Illus. $6.50.

This little book is intended to bridge the gap between elementary books prepared for laymen and the more complex treatises written for students and professionals who have a firm background in mathematics and physics. It is concerned with the theoretical and practical aspects of the electron microscope and with its design. Although