In the next ten chapters the authors discuss various factors that may influence the quantities measured. These factors include, among others, the humidity in the plant; the grade, length, and fineness of fiber used in manufacture; and typical changes in machine operation. Again adequate and typical data are presented, the calculations are illustrated, and the results are evaluated for practical use.

The remaining 14 chapters discuss textile testing methods and instruments; for each quantity, practical data, drawn from normal textile experiments or operations, are presented together with the necessary calculations, evaluations, and appropriate recommendations. The book concludes with a number of informative tables—for example, names and descriptions of common textile defects, their sources and causes, and places of responsibility.

The authors adequately attain their objective of providing a book for practical use by executives, technologists, and students of textiles.

HERBERT F. SCHIEFER
Textile Section,
National Bureau of Standards

Stars and Stellar Systems. vol. 1, *Telescopes*. Gerard P. Kuiper and Barbara M. Middlehurst, Eds. University of Chicago Press, Chicago, Ill., 1961. xv + 255 pp. Illus. $8.50.

Tools of the Astronomer. G. R. Miczaika and William M. Sinton. Harvard University Press, Cambridge, Mass., 1961. viii + 294 pp. Illus. $7.75.

In the burgeoning society of scientific instruments, astronomical telescopes are real aristocrats. Among the parvenus—the synchrotrons, transistors, nuclear magnetic resonance spectrometers, and the like—the present generation of telescopes stand apart as the obvious, direct, lineal descendants of the instruments which first searched the skies three and a half centuries ago. Galileo or Newton would have no great difficulty in recognizing a modern telescope or in comprehending its purpose. This is because the instrument is essentially a simple one, with the simple function of forming images of celestial objects. Sometimes the emphasis is on images of large scale; more often nowadays it is on high light flux.

Compared with most research tools, the astronomical telescope has certainly shown a remarkably well-ordered, slow, and steady evolution. Even individual telescopes are long-lived compared with most research instruments: more than 50 years after its erection by George Ellery Hale, the 60-inch reflector on Mount Wilson is still in nightly demand for astronomical research. All this is not to deny that there have been important advances in the art of telescope-making. The moving parts of the Hale telescope weigh 530 tons; but the 17-foot mirror is figured to such perfection and it is mounted and moved with such delicacy, that it is regularly capable of concentrating within a 50-micron circular image 80 percent of the light of a star on its optical axis and of maintaining the shape and position of the image for hours as the star moves across the sky.

Side by side with the increasing refinement of telescopes, and with their growth in size and light-gathering power, there has occurred a vigorous development of the instruments that are auxiliary to telescopes. Here the pace has accelerated in recent years, and we have seen the emergence of entirely new techniques. Among all the receptors used with the 60-inch telescope on Mount Wilson, only the eye remains as it was 50 years ago; and the eye is virtually never used for observations. The photographic plates, the photometers, the spectrographs—all the paraphernalia of detection and measurement—are vastly different now, and much better.

The Kuiper-Middlehurst book limits itself to telescopes themselves, leaving the description of the auxiliary equipment to another of the proposed nine-volume compendium of stellar astronomy and astrophysics. Thirteen authors contribute chapters describing the various kinds of modern astronomical telescopes that are useful in these areas; radio telescopes are included. Two of the most interesting chapters discuss astronomical "seeing" (that is, atmospheric effects on image quality) and observatory site selection. Each author writes authoritatively. The volume is addressed to astronomers, or to others who have training in science or engineering.

The Miczaika-Sinton book, on the other hand, addresses itself to the nonprofessional reader, the college undergraduate, or the astronomy buff. Moreover, it includes a discussion of the various kinds of detectors, of solar telescopes, and of the numerous auxiliary devices that are used in astronomy: the spectrographs, photometers, measuring engines, and so forth.

If any criticism is leveled at these volumes, it could be on the score that neither makes it quite clear just how much the design of a telescope is ultimately governed by the properties of the detector used with it. There are revolutionary developments afoot in detector technology now, and these are likely to have a major impact on the design of future telescopes. But whether or not they clearly herald such imminent changes, these are both first-rate books. Especially at this time, when so many in other branches of science and engineering have found a sudden incentive to learn about astronomical instruments, *Telescopes* and *Tools of the Astronomer* are certain to be well received and widely used.

ARMIN J. DEUTSCH
Mount Wilson and Palomar Observatories, Carnegie Institution of Washington, California Institute of Technology

Russian for Scientists. Dennis Ward. Macmillan, New York, 1960. 204 pp. $3.95.

This compact manual aims to help beginners achieve adequate skill in reading scientific texts. The materials on grammar are presented capably, clearly, and in judicious sequence. In his treatment of forms, the author emphasizes "markers"—that is, distinctive graphic features—an approach which I find to be generally successful. Illustrative sentences for translation from Russian to English (but not from English to Russian) are abundant and varied, with ample and excellent vocabulary help given on the spot. The table of verbs included in the index will be useful to some. The end vocabulary is excellent and complete. The entire work, including the printing, demonstrates great care.

I recommend two minor improvements that could be made as additions in the appendix. Aside from three selections in the middle of the book there are no "readings" with connected discourse. I would like to see the student rewarded with a few morsels to read (with some aids) before he "graduates." Since so much attention is given to the markers, I believe that an alphabetical index of them would be useful.

Here are some recommended vo-

cabulary additions: ряд: a large number; лéто (*in the singular*): summer, *not* year; картúна: situation; при э́том: moreover, at the same time, in this connection; наблюда́ться: to occur.

This is an excellent guide for initiates in or outside of a class. Moreover, science students with a background in general Russian should find this a useful review grammar and builder of basic scientific vocabulary, well worth covering before essaying genuine texts.

NORMAN HENLEY
Johns Hopkins University and
Goucher College

Mathematical Thinking in the Measurement of Behavior. Herbert Solomon, Ed. Free Press, Glencoe, Ill., 1960. 314 pp. $7.50.

Within this volume are three distinct monographs, each representing a survey of mathematical approaches to selected problems in social science. The first and longest is "The Mathematical Study of Small Groups," by James S. Coleman (150 pages). Ernest W. Adams has contributed "Survey of Bernoullian Utility Theory" (118 pages), followed by "A Survey of Mathematical Models in Factor Analysis" (46 pages) contributed by the editor. All were prepared as part of the program of the Bureau of Applied Social Research of Columbia University and were initiated during the period 1952–56.

Coleman begins by considering explanations for the relative paucity of mathematical models for behavior of small groups, then examines in detail several models which have been proposed, systematically discussing the purpose and the advantages and shortcomings of each. The 21 pages that constitute the evaluation of approaches toward model-building in the social sciences should be recommended reading for all students of mathematical social science. Indeed, it is this critical assessment of model-building strategies which serves to motivate the entire monograph. Models are separated into two types, those based upon empirically verified postulates, in which case theorems have predictive status, and models based upon verified theorems, in which case empirical confirmation of the postulates becomes of interest. When a proposed model can be characterized by neither form of correspondence with empirical observation, one can wonder, with Coleman, concerning its role in science.

The second monograph, by Ernest Adams, includes critical examination of the assumptions of Bernoullian utility theory, notes some suggested modifications of the theory (for example, incorporation of subjective probability), presents an introduction to decision theory, and finally discusses attempts to verify empirically certain aspects of utility theory. The monograph serves as a useful introduction to these topics, which have become a focus of increasing attention from social scientists in recent years.

In the final paper, Solomon presents a chronological history of factor analysis, considering each major theory as a mathematical model for observed data.

This volume may not completely fulfill the expectations of some readers, misled by the implied breadth of its title. Such readers, however, are not likely to be permanently disappointed. The decision to present detailed analysis of a few representative topics rather than superficial coverage of many was a wise one. The three contributions are of high quality and equip the reader, whether graduate student or research worker, with considerable understanding of the criteria for useful formalization of theory in social science.

LYLE V. JONES
Psychometric Laboratory, University of North Carolina, Chapel Hill

New Books

Biological and Medical Sciences

Biological Problems Arising from the Control of Pests and Diseases. R. K. S. Wood. Inst. of Biology, London, 1960. 128 pp. 25s.

The Cell Nucleus. J. S. Mitchell, Chairman. Academic Press, New York, 1960. 282 pp. Illus. $11. Proceedings of an informal meeting held at the Department of Radiotherapeutics, University of Cambridge, 31 August–1 September 1959 by the Faraday Society.

Cell Physiology of Neoplasia. Published for the M. D. Anderson Hospital and Tumor Institute. Univ. of Texas Press, Austin, 1960. 661 pp. Illus. $10.50. Papers presented at the 14th annual symposium on fundamental cancer research, 1960.

The Infectious Diseases of Domestic Animals. With special reference to etiology, diagnosis, and biologic therapy. William Arthur Hagan and Dorsey William Bruner. Cornell Univ. Press, Ithaca, N.Y., 1961. 1051 pp. Illus. $11.50.

International Review of Cytology. vol. 10. G. H. Bourne and J. F. Danielli. Academic Press, New York, 1960. 423 pp. Illus. $13.

An Introduction to the Mathematics of Medicine and Biology. J. G. Defares and I. N. Sneddon. Yearbook, Chicago, Ill., 1960. 675 pp. Illus. $14.

Introduction to Parasitiology. With special reference to the parasites of man. Asa C. Chandler and Clark P. Read. Wiley, New York, ed. 10, 1961. 834 pp. $9.75.

Introductory Botany. Arthur Cronquist. Harper, New York, 1961. 903 pp. Illus. $9.25

A Laboratory Manual of Analytical Methods of Protein Chemistry (Including Polypeptides). vol. 2, *The Composition, Structure, and Reactivity of Proteins*. P. Alexander and R. J. Block, Eds. Pergamon, New York, 1960. 528 pp. Illus. $14.

Laennec, His Life and Times. Roger Kervran. Translated from the French by C. D. C. Abrahams-Curiel. Pergamon, New York, 1960. 223 pp. $3.50.

Medicine Makers of Kalamazoo. Leonard Engel. McGraw-Hill, New York, 1961. 269 pp. $4.50.

The Nervous System. G. M. Wyburn. Academic Press, New York, 1960. 191 pp. Illus. $5.

New Approaches in Cell Biology. P. M. B. Walker, Ed. Academic Press, New York, 1960. 216 pp. Illus. $6. Proceedings of a symposium held at Imperial College, London, July 1958.

Pêches Continentales. Biologie et aménagement. R. Vibert and K. F. Lagler. Dunod, Paris, 1961. 744 pp. Illus. NF. 88.

Physical Chemistry for Students of Pharmacy and Biology. S. C. Wallwork. Longmans, Green, New York, ed. 2, 1961. 369 pp. Illus. Paper, $3.75.

The Physiological Basis of Medical Practice. A text in applied physiology. Charles Herbert Best and Norman Burke Taylor, Eds. Williams and Wilkins, Baltimore, Md., ed. 7, 1961. 1570 pp. Illus. $16.

The Physiology of Crustacea. vol. 2, *Sense Organs, Integration, and Behavior*. Talbot H. Waterman, Ed. Academic Press, New York, 1961. 695 pp. Illus. $23.

The Practical Application of Medical and Dental Hypnosis. Milton E. Erickson, Seymour Hershman, and Irving I. Secter. Julian Press, New York, 1961. 480 pp. Illus. $12. Publication of the Seminar on Hypnosis Foundation.

Progress in Endocrinology. pt. 1, *Neuroendocrinology and Endocrinology of the Thyroid and Parathyroid Glands*. K. Fotherby, J. A. Loraine, J. A. Strong, and P. Eckstein. Cambridge Univ. Press, New York, 1960. 176 pp. $8.50.

Radiation Protection and Recovery. Alexander Hollaender, Ed. Pergamon, New York, 1960. 392 pp. Illus. $10.

Recent Advances in Renal Disease. M. D. Milne, Ed. Lippincott, Philadelphia, Pa., 1961. 263 pp. Illus. $5. Proceedings of a conference held at the Royal College of Physicians, London, July 1960.

Remington's Practice of Pharmacy. Eric W. Martin *et al.*, Eds. Mack, Easton, Pa., ed. 12, 1961, 1886 pp.

Vergleichende Physiologie. vol. 5, *Physiologie der Erfolgsorgane*. W. von. Buddenbrock. Birkhauser, Basel, Switzerland, 1961. 390 pp. Illus. F. 54.