even in Russian before 1957, and the last comprehensive account, in English, of the geology of Russia is more than a century old, and excluded Siberia.

The Geology of the U.S.S.R. is, in effect, an extended explanation of the English language version of a special edition, on a scale of 1 to 7.5 million, of the new geological map of Russia, prepared for foreign distribution by the Ministry of Geology of the U.S.S.R. The map itself, in full color and excellent registration, is a superb example of geologic cartography. The translation of the text was prepared with the cooperation of Academician Nalivkin himself, dean of Russian geologists and perhaps the only man living or dead who could have written such a book as sole author.

The text consists of a sequence of brief synoptic surveys of major geographic, stratigraphic, tectonic, and magmatic features and of mineral and mineral-fuel resources of each of the ten principal physiographic and geologic subdivisions of the Soviet Union. Such a document can hardly be considered light reading, and few will want to read it from cover to cover. It is, nevertheless, an invaluable source book whose study is facilitated by a detailed index which, in addition to page references, gives the latitude and longitude of localities on the map.

It would be meaningless to attempt here to discuss such condensed subject matter in any detail, but a few items are of sufficiently broad or unusual interest to deserve mention. One is the vast extent of permanently frozen ground in Siberia, much of it with a forest cover, and extending at places to as much as 20 degrees south of the southern limit of Pleistocene continental glaciation. Other matters of special interest include the great thickness and extent of late Precambrian sediments and Nalivkin's opinion that the Siberian archaeocyathids are, after all, mainly Early and not primarily Middle Cambrian as now widely believed. The picture of Soviet mineral resources which emerges from the various sectional accounts is one of unspecified but allegedly ample reserves of most of the important industrial and precious minerals and mineral fuels, with the possible exception of oil.

Incidentally, those who wish to inquire more deeply into the subject of this book will find it treated extensively in a three-volume, multiauthor compendium, *The Geological Structure of the U.S.S.R.*, published in Russian (1959) and available in a French translation from Service d'Information Géologique (B.R.G.G.M., 74 rue de la Fédération, Paris 15). A geological map of the Soviet Union in 18 sheets, at a scale of 1 to 2.5 million, with Russian and English explanations, and published in 1956, is also available from the Soviet Ministry of Geology.

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Mammals of Wisconsin. Hartley H. T. Jackson. University of Wisconsin Press, Madison, 1961. xii + 504 pp. Illus. $12.

The Recent Mammals of Arizona: Their Taxonomy and Distribution. E. Lendell Cockrum. University of Arizona Press, Tucson, 1960. viii + 276 pp. Illus.

Mammals of Wisconsin is the result of more than 3½ years of field work carried out between 1917 and 1951 by Jackson and his associates in the Fish and Wildlife Service and the Wisconsin Conservation Department. Additional years were given to the examination of thousands of specimens (including 6300 Wisconsin specimens), compilation of information from the extensive literature, and selection of hundreds of illustrations. Most of the book (414 pages) is devoted to accounts of the Recent mammals: artificial keys for identifications down to families and sometimes to genera and, for the 84 species or subspecies, sections on common names, descriptions, identification criteria, distribution in the state, status, habits, and specimens examined. There are maps showing state and continental distribution of each kind of mammal, and line drawings and photographs of skulls, teeth, and other diagnostic parts and of tracks, scats, burrows, nests, and so forth. The illustrations have been chosen with great care to show important characteristics of various species. A 46-page bibliography and a 19-page index conclude the volume. In composition, design, and typography it is top-grade but, to keep the cost within reasonable limits, some quality has been sacrificed in reproducing the photographs.

The book is highly readable and is a mine of information on occurrence, habits, economic and other values, and management. It will be invaluable to professional and amateur mammalogists and "mammal-watchers," not only in Wisconsin but throughout the north central states and western Ontario.

Because Arizona is ecologically complex and new facts bearing on the evolution and distribution of mammals are still being uncovered, that state is not ready for a comprehensive treatise. *The Recent Mammals of Arizona* is a summary of known distributional and taxonomic data. An identification key for the 290 species and subspecies currently recognized as occurring in Arizona is followed by an account of each kind of mammal; this account includes synonomy, distribution in the state, specimens examined, and additional records. Collecting localities of the specimens are shown on range maps (111) that are sufficiently large and uncluttered to serve their purpose effectively. There is a 15-page bibliography but no index. Cockrum, a professor of zoology at the University of Arizona, has produced a basic book which will be indispensable to every mammalogist working in Arizona for many years to come.

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Handbook of Textile Testing and Quality Control. Elliot B. Grover and D. S. Hamby. Textile Book Publishers (Interscience), New York, 1960. vi + 614 pp. Illus. $17.50.

In the first nine chapters Grover and Hamby illustrate how to make various statistical calculations from observed data. The formulas are simply given, the meanings of the symbols are stated, but the reader is spared the derivations, which can be found in many standard texts. Numerical data, typical of a textile process or of an experiment, are tabulated, and the numerical calculations are indicated step by step. Results are interpreted in the language of a textile technologist, and their use is illustrated by means of quality control charts with upper and lower control limits. These treatments cover both quantitative and qualitative data, such as the strength of a product and the fraction or percentage found to be defective during a given period or quantity of production. Pertinent problems are included for use in mastering the calculations and in establishing quality control charts, drawing conclusions, and recommending courses of action or remedies.

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.

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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.

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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-