testimony of the joint hearings have all supported the vital need of a National Science Foundation. Moreover, a poll of the American Association for the Advancement of Science in September showed that 90 per cent. of the scientists of the country want legislation for a Federal Science Foundation.

A revision of the Kilgore and the Magnuson Bills is expected, advantage being taken of the hearings held in Washington. A joint bill is to be hoped for which will embody the best and most workable features of both.

We stand ready to cooperate fully and freely in the drafting of a bill which will effectively serve the objectives which the foundation is intended to achieve.

On behalf of the Joint Executive Committees of the Union of American Biological Societies and the American Biological Society,

ROBERT CHAMBERS, *President, Union of American Biological Societies*
J. S. NICHOLAS, *President, American Biological Society*

SCIENTIFIC BOOKS

ASTRONOMY

Astronomy; A Revision of Young's Manual of Astronomy. Vol. 1, *The Solar System.* By HENRY NORRIS RUSSELL, RAYMOND SMITH DUGAN and JOHN QUINCY STEWART, Editors. Illustrated. xi + 470 + xxi pp. Ginn and Company. 1945. $3.00.

THIS volume constitutes a revised edition of Part 1, "The Solar System," being the first of two volumes on "Astronomy" initially published in 1926. The rapid advance of astronomy in the last twenty years has called for a revision of this outstanding text. A superficial comparison of the present book with the earlier edition reveals essentially the same text and subject-matter page for page. A careful comparison of the new with the old edition, however, shows many changes and additions made necessary by current progress.

This book, as the 1926 issue, is based on C. A. Young's "Manual of Astronomy," published in 1902. The present volume comprises 470 pages devoted to the fundamentals of astronomy, astronomical instruments, the earth, the sun, the moon, planets, comets and meteors.

Among newer and additional topics not covered in the earlier edition may be mentioned the Schmidt camera, the small effect of the variation of latitude on longitude, extension of the use of gravity measurements to belts of deficiency and excess as in the island arcs of the East and West Indies, a revision and extension of the treatment of the age of the earth and its early history, the new determination of the moon's mass derived by H. Spencer Jones from observations of Eros, the new value of the solar parallax, the mention of the connection of sunspots with radio transmission, more recent data from eclipse observations on the Einstein effect, the contribution of Adams and Dunham and others to a better knowledge of the atmosphere of the planets, the discovery of Pluto, new material on comets and meteors, and a summary of newer theories on the origin of the Solar System.

It is remarkable that so much of the book could have been changed without more interference with the original pagination. This has been accomplished in many instances by the deletion of some material, the omission of a few illustrations and by taking advantage of the unused space at the end of several chapters in the earlier edition. The reader finds certain omissions of topics which could have been logically hoped for in so comprehensive and standard an authority on astronomy.

In the chapter on astronomical instruments, no attention is given to the photozenith tube (PZT), the latest development in the precise determination of latitude at the U. S. Naval Observatory. In the discussion of longitude by radio or wireless signals, the velocity of transmission time based on the 1913–14 longitude campaign between Paris and Washington is given as 175,000 miles per second, "which agrees within the (large) experimental error with that of light." No mention is made of investigations showing observed differences in the velocity of radio waves with (geomagnetic) latitude, yielding results varying from sensibly the velocity of light at the equator to only two thirds the velocity of light at the region where radio transmission paths approach the north magnetic pole. In the treatment of the calendar, one looks in vain for a mention of proposed calendar reform with an evaluation of the major schemes now under international consideration.

In the chapter on the sun, it is unfortunate that the authors did not revise the curve of sunspot numbers and geomagnetic activity to include more recent data than that of the 1920's. The importance of solar activity in establishing wave-lengths or frequencies for all long-distance radio communication deserves a more extended treatment than the half-sentence devoted to it, "magnetic storms are accompanied by serious disturbances of long-range radio transmission." The close dependence of usable frequencies

upon the sunspot curve has long been recognized by radio engineers and would appear to be irrefutable. The remarkable fadeouts in radio reception at all frequencies on the sunlit half of the earth which occur simultaneously with solar explosions, or flares, could well have been mentioned, since the student of to-day is becoming more and more consciously aware of cosmic factors in communication conditions. It may be noted that the authors apparently prefer the now obsolescent form in spelling "sun-spots" with the hyphen, although current literature and modern editions of Webster give little justification for the hyphenated form.

The slight mention in a book of astronomy of possible relations between the solar cycle and meteorological conditions is encouraging. Because of the practical implications involved, some mention could well have been made of the apparent changes in distribution of atmospheric pressure over the globe with the sunspot cycle, an effect more pronounced than the small temperature differences to which the authors appear to subscribe.

The rapid advance in highly specialized fields in all branches of science has made more and more difficult the writing of and also the finding of generally comprehensive text-books on the basic sciences. Astronomy, probably the oldest of the sciences, has a delightful way of interpenetrating many fields from geodesy and geophysics to atomic structure and even radio engineering. The authors have done a valuable service in revising Volume 1, and one can anticipate that the revision of Volume 2, covering the stars and astrophysics, will contain even greater changes upon its appearance.

HARLAN T. STETSON

THE STUDY OF HUMAN BEHAVIOR

Developmental Psychology: An Introduction to the Study of Human Behavior. By FLORENCE L. GOODENOUGH. Second edition. New York: D. Appleton-Century Co. 1945. $3.75.

THE second edition of this widely used text-book is larger (723 pages in place of 619) and more profusely illustrated (123 figures in place of 81) than the first edition, which appeared in 1934. The author has preserved the best features of the original formulation, while major reorganization of several important chapters has strengthened the general integration of the subject-matter, and the addition of new material has greatly enriched the presentation.

The general plan of the book's organization remains a chronological one in that the principal data of psychology are considered in so far as possible in their relation to the developmental history of the individual, beginning with the prenatal period and continuing to old age. The method of presentation, which is well suited to the beginning student, includes a number of very useful pedagogical devices and has in its favor an obviously logical structure and a clear simple style, both of which contribute a high degree of "teachability." There is a commendable and in the main successful attempt to present psychology as a practical subject with direct bearing upon the student's everyday life.

The manner in which certain subjects are presented may be criticized, although the criticism probably indicates differences of opinion rather than any major weakness in the book. In Chapter XIII, which is entitled "Social and Emotional Behavior of Young Children," the discussion of play is somewhat inadequate and the speculations of Groos, Spencer and others are presented quite uncritically, although the circularity of reasoning upon which they are based might be stressed to the reader's profit. On the whole the data of comparative psychology do not seem to have been employed to their full effectiveness. The discussion of higher psychological processes in subhuman animals tends to be superficial (Chapters X and XIV), and in connection with her consideration of mental disease Goodenough waxes enthusiastic over N. R. F. Maier's work on "neurotic" behavior in rats. This is of course the author's privilege, but she will probably be criticized for omitting any mention of the several investigators who have published contradictory results, and for the general failure to acknowledge the highly controversial nature of Maier's original interpretation of the phenomena under consideration.

These are minor and debatable criticisms, but somewhat more serious questions can be raised concerning the rather extended treatment of several non-psychological subjects. Chapter III ("Our Hereditary Background") embodies a condensed but nonetheless lengthy discussion of chromosomal mechanics. The reviewer can not help but wonder whether those facts of inheritance which may be important to the beginning student of psychology could not have been presented without recourse to a detailed description of such highly specialized genetic problems as those involved in gametogenesis. Similarly one finds in Chapter IV ("Prenatal Development") several pages of material which would not be out of place in a text on introductory embryology; and although it is of general scientific interest the information presented has very little obvious connection with the psychological material which follows.

It is not difficult to understand how a desire to present a complete picture of ontogenetic development should lead to the inclusion of a good deal of elementary genetics and embryology, but it is hard to rationalize the perpetuation of the pointless treatment