

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

of neuroanatomy which has formed a regular part of standard psychology texts for many decades.

For some obscure reason psychologists traditionally have burdened their students with detailed descriptions of the nervous system, apparently in the hope that knowledge of this sort will in some mysterious fashion prove helpful to an understanding of psychological events. The regrettable fact is that to date there remains a vast chasm between the established data of mental activity and those of neurology; and the reviewer doubts seriously whether a purely descriptive account of the anatomy of the nervous system can be of any assistance to the student's comprehension of psychological phenomena. Possibly the advanced reader profits from a competent review of certain aspects of neurophysiology such as those involved in recent studies on electrical activity of the brain or acetylcholine and cholinesterase metabolism, but even here the potential psychological implications of the physiological data are so speculative that one is tempted to deny the original assumption and to insist that the psychology student's efforts might more profitably be directed toward a fuller investigation and better understanding of phenomena which belong within the psychological sphere as currently defined.

Obviously there are other points of view and it may well be that teachers of psychology will welcome precisely those sections in Professor Goodenough's book which the reviewer is inclined to regard as unnecessary. In any event, the inclusion of this material need not detract from the volume's obvious value as a text-book nor from the fact that the author has done a commendable job of synthesizing the important material in her field.

F. A. BEACH

THE AMERICAN MUSEUM OF NATURAL HISTORY

THE STORY OF THE WRIGHT BROTHERS

The Wright Brothers. By FRED C. KELLY. New York: Harcourt, Brace and Company. 1945. \$3.50.

HERE, for the first time, is a complete and authentic record of the first men who achieved, sustained and controlled flight in a heavier-than-air flying machine—a biography authorized by Orville Wright.

The story begins with the boyhood background of Orville and Wilbur Wright, and covers, in interesting form, their many dreams, activities and enterprises which led to that epoch-making event at Kitty Hawk, North Carolina, on December 17, 1903, when, with Orville Wright at the controls, their bi-plane took off from the sand dunes and made flying history.

Following the first successful flight, a detailed account is given of their difficulties with the press, the lack of interest first shown by the United States

Army, their successful flights and demonstrations in Europe, their engagement in the aviation business, their building the first airplane for the United States Army and their patent suit with Curtiss.

This story of the Wright Brothers is the most complete single volume depicting the history of their work in aviation and clarifies beyond question the disputes which finally culminated in their being given proper and full credit for making the first man-carrying controlled and sustained flight in a heavier-than-air machine.

Mr. Kelly has done a remarkable job in his book, and has compiled, in a form delightful to read, a great mass of details and information which is a splendid record of our two foremost American pioneers in aviation, Orville and Wilbur Wright.

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