Book Reviews

Our sun. Donald H. Menzel. The Harvard Books on Astronomy. Philadelphia: The Blakiston Company, 1949. Pp. 326. $4.50.

One of Dr. Menzel's principal contributions to astrophysical thought has been his insistence, often in the face of opposition, that the stars must not be regarded as static formations, but rather as turbulent masses of gas whose outer layers are constantly moving about in different directions, giving rise to tremendous prominences, extended atmospheres, coronas, and various types of corpuscular radiations. His new book on the sun shows why he has maintained this picture of a star. There is every reason to believe that the sun is not unusual and that its prominences, spots, flocculi, and flares are regular properties of most stars.

The book is full of useful and up-to-date information. The first eight chapters describe the various features of the solar surface, including recent developments in infrared spectroscopy at the University of Michigan and elsewhere. The problem of the spicules recently discussed at the Harvard High Altitude Observatory in Climax is treated in detail, as are also the new results on prominences derived by means of moving picture cameras.

Chapter 9 is an account of the corona and gives a thorough discussion of Edlén's identification of the coronal lines and of Lyot's work on the shape of the corona. There is a section devoted to the solar radio noise, and a discussion of the theoretical implications of the high temperature of the corona.

Chapter 10 discusses the structure of the interior of the sun and the now generally accepted ideas of the source of the solar energy. Only one page is devoted to the origin of the solar system, probably because this topic was previously discussed by F. L. Whipple in his book *The earth, moon and planets*—another issue of the Harvard series.

Chapter 11 deals with the eclipses of the sun and records many personal experiences and observations of the author. Incidentally, the results of Van Biesbroeck's measurement of the relativity shift in 1947 have been known for some time. The value, as published in the *Astronomical Journal*, No. 1175, page 71, 1948, is $2.01 \pm 0.18''$.

The last chapter is devoted to those terrestrial effects which are correlated with solar phenomena. The illustrations are numerous and are exceptionally good, but Fig. 149, showing the Doppler effect of the recession of the spiral nebulae, although often used in various recent publications, is so heavily retouched that it gives an altogether erroneous impression of the spectral lines. The curve of growth shown in Fig. 59, although copied from another publication, is grossly misleading and should certainly be replaced by a more accurate diagram when this book is revised for a second edition.

Most readers will be surprised that Hale's great work on the sun is comparatively little recognized. For example, his invention of the spectroheliograph is dismissed in two sentences, and the enormous productivity of his own research and of that of his associates at the Kenwood, Yerkes, and Mount Wilson Observatories has not been accentuated, but has rather been submerged in the great mass of more recent advances. Despite these minor criticisms, the book is an important addition to the astrophysical literature. It is primarily intended for the amateurs, but professional astrophysicists will also find it a valuable and interesting summary of modern solar physics.

OTTO STRUVE

Yerkes Observatory

Embryology. Lester George Barth. New York: The Dryden Press, 1949. Pp. viii + 330. (Illustrated). $5.00.

In the pedagogical realm, no science deserves more or has received less from its practitioners than embryology. No biological field offers more drama and excitement than the one which treats of the transformation of a simple, tiny egg into a complex being. Yet most textbooks of embryology in use today are calculated to give the student the impression that embryology is the deadest of the sciences. It is a pleasure to record that this situation has just been altered by the appearance of a college-level text in which development is analyzed as well as described. The book is *Embryology*, by L. G. Barth of Columbia University.

The book opens with a brief but compelling statement of the problems of embryology. The viewpoint indeed is primarily analytical throughout. For example, the experimental work on the make-up of the unfertilized egg, on gastrulation and the organizer, and on the gradual differentiation in the neurula stages, is dealt with before the actual development of the frog's egg is described. Moreover, although there are chapters specifically devoted to the traditional chick embryo and to the mammal, the author also draws on hydroids, flatworms, and echinoderms where they are useful in illustrating principles.

The order of topics is roughly chronological, beginning with ovulation and proceeding to the later phases of development, where the several organ systems are considered separately. In addition to the material conventionally treated in embryology texts, however, this book also deals with fertilization, regeneration, growth, sex differentiation, and embryonic physiology. In all cases an analytical approach is adopted wherever the material allows it, the tone throughout being critical and inquiring. The style, moreover, is clear and terse. It will be a poor student indeed who is not stimulated by the whole presentation.