

BOOK REVIEWS

Sense and Sensibility

Sterne und Menschen. By Albrecht Unsöld. Pp. viii+170. (Springer: Berlin and New York, 1972.) 29.80 DM; \$9.30.

In thirteen short essays one of the world's leading astrophysicists conveys his thoughts upon many facets of his science and its creators. The individual pieces are dedicated to diverse scientific occasions during the past two decades; there is no connexion between them save the involvement of the author, and one of the rewards for the reader is that they make him much better acquainted with the author himself. For Professor Unsöld has long been a legendary figure in astrophysics, famous for his work on stellar atmospheres and related problems of the abundances of the elements, and for his monumental *Physik der Sternatmosphären*; and more recently, by his book *Der neue Kosmos* and its translations into English and other languages, he has gained fresh fame as an expositor of modern astronomy as a whole; now in *Sterne und Menschen* he reveals himself as the possessor of an even greater range of talents which he exercises with rare sensitivity.

Here Unsöld writes with the meticulous scholarship of his other works, but with a lighter touch appropriate to such occasional essays. For instance, in one we meet Heinrich Hertz *not* making his most famous discoveries in Kiel because the winters there made him so miserable; in the next we learn how far Hertz went in anticipating certain features of general relativity some 20 years before the work of Einstein; in another, Unsöld can in a few sentences conjure up the intellectual climate of the 19th century forbears of his contemporary astronomer Paul ten Bruggencate.

Several of the items arise out of Unsöld's 40 years of devoted service to the University of Kiel. Indeed, the first is his Rectorial address of 1958 in which he gives a masterly survey of the basic ideas of physics and their place in the whole of human thought; those about Max Planck, Heinrich Hertz and Walter Kossel are occasioned

by associations they had had with Kiel, and so on. There are also acute notices of the astronomers Otto Struve and M. G. J. Minnaert. Fortunately the set includes two addresses in which Unsöld expounds in a general way his own views about the abundances of the chemical elements and their origins—the outcome of a lifetime of thought upon the subject. The book will rank amongst those that earn for science its place among the humanities.

W. H. McCREA

Biological Rhythms

The Living Clocks. By Ritchie Ward. Pp. 319. (William Collins: London, March 1972.) £2.50.

THIS book is more nearly a collection of about twenty independent short stories, all of them interesting and lively, none requiring sustained attention. Thus it can be fitted into a pleasant evening in and out of your favourite chair at home.

Ward relates in historical and biographical format the remarkable observations of naturalists and laboratory biologists interested in daily rhythms. His prose is lively and sustains attention, though frequently lapsing into uncritical excesses of enthusiasm, for example when exclaiming that the discovery of internal rhythms is at least as profound as Einstein's paper of 1905 and as glamorous as Watson and Crick's unravelling of the physical basis of heredity. Off-putting as such hyperbole may be, the fact should not be overlooked that some astonishing facts are reviewed in these vignettes, almost all of which await explanation.

Introductory chapters mine the little-known literature of daily and seasonal rhythms, bringing to attention such gems as the entry in Columbus's logbook that flickering lights were sighted from the Santa Maria in the dark West Indian seas at exactly the hour and phase of the Moon when, we now know, the Bermuda fireworm discharges gametes in luminous streams.

About one-third of the way through, Ward's style becomes more biographical

and more authoritative, benefiting from the personal interviews he arranged with prominent "clocks" investigators, from the venerable pioneers down to a cautious cutoff age of about forty. Ward makes no attempt to segregate the prophets from the heretics, though he is careful to point out that some particularly spectacular claims are not widely believed. His few errors of fact, omission, or scientific precedent are, I think, mainly of interest to scholars involved professionally and need not distract from the central message: that the most diverse organisms—maybe even all eukaryotes—really are organized around almost-daily, -tidal, and -seasonal periods, occasionally with startling persistence and precision such as we see in the navigational feats of migratory birds, for example . . . and that these phenomena were encountered in surprising ways by interesting people. Ward points to vaguely foreseen implications for agriculture, ecology, and medicine, such as the possibility of minimizing "jet-lag" by exposing travellers to a well-timed light pulse, or exterminating crop pests by aborting their winter diapause with field lights.

The physiology underlying these phenomena remains as obscure as the names of the younger scientists now seeking ways to enquire more deeply into them. I anticipate that the correlation between these two omissions will become manifest within ten years.

A. WINFREE

Agrarian Britain

Patriotism with Profit: British Agricultural Societies in the Eighteenth and Nineteenth Centuries. By Kenneth Hudson. Pp. xii+143. (Hugh Evelyn: London, 1972.) £5.25.

THE object of this book, says the author in his introduction, is to eschew the Great Man interpretation of English agrarian history, typified by Lord Ernle in his praise of the traditional agricultural heroes, Townshend, Bakewell, and Coke, in favour of a social analysis of agricultural progress. Specifically, he wishes to demonstrate that the