highly complex fossil history of the Proboscidea, the great order of mammals of which the modern Asiatic and African elephants are the sole survivors; and the third, with a brief survey of the relationships between elephants and Man. Each of these three sections presents a well-balanced treatment of a very large subject.

In a book such as this it is necessary for the author to condense the material a great deal, and Carrington has handled this difficult task in admirable fashion. It would have been nice if there could have been more illustrations, especially in the first two sections of the book, but considerations of space and economy obviously would not allow this. A good, selected bibliography at the end of the book supplies ample references for the reader who may wish to pursue the subject of elephants beyond this "basic" presentation.

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Handbuch der Physik. vol. 51. *Astrophysics,* II. Stellar structure. S. Flügge, Ed. Springer, Berlin, 1958. viii + 830 pp. Illus. DM. 175.

Though this book is prosaically subtitled "Stellar structure," it is concerned mainly with the latest theories and hypotheses of stellar evolution. Nothing like it could have been written 10 years ago, and most of its ideas would have been described a generation ago as the outpourings of a group of scientific cranks. I remember vividly an incident at the Yerkes Observatory when a distinguished professor of the University of Chicago—a man well known for his own scholarly research—assured me that it was a waste of time to read an article by A. S. Eddington which purported to show that the central temperature of the sun is 20 million degrees. I also remember an earlier occasion, in 1913, when two leading European astronomers argued that it would be hopeless to attempt to measure the gravitational displacements of star images during an eclipse of the sun because, in the first place, the effect predicted by Einstein probably did not exist, and, in the second place, even if it did, the amount of displacement would be too small to be ascertained.

Lulled by a century devoted to the painstaking accumulation of facts about the universe and the slow interpretation of these facts, we professional astronomers had become (with a few notable exceptions) unduly conservative and cautious in accepting new and revolutionary ideas. We enjoyed the books by Flammarion and Fournier d'Albe but relegated to the domain of belles-lettres their flights of imagination. We recognized Arrhenius as a great chemist but smiled at his fanciful astronomical hypotheses. We failed to comprehend the enormous astronomical significance of cosmic rays, and we neglected to profit by Jansky's epochal discovery of cosmic radioradiation until the radio engineer Grote Reber had learned enough astronomy to show us the way.

All of this conservatism was wiped off the face of the earth in that flash of light which accompanied the first test explosion of the atomic bomb in New Mexico. Today we are no longer surprised when astrophysicists talk about billions of planets belonging to stars other than the sun, or when a radio astronomer seriously considers sending radio signals to a planet revolving around a star of solar type some 10 or 20 light-years away. We accept almost without protest a theory which predicts an internal stellar temperature (in giant stars) of several billion degrees or an average density (in a white dwarf) a million times greater than that of water. And we speculate about the formation of all chemical elements out of hydrogen in stellar interiors and even on the surfaces of many stars.

It may well be that a future historian will criticize us for having lost our balance between judicious conservatism and exuberant revolutionism. He may even paraphrase Martin Gardner's sentences [*Fads and Fallacies in the Name of Science* (Dover, New York, 1957), p. 3] and say: "One curious consequence of the current boom in science is the rise of the promoter of new and strange scientific theories. He is riding into prominence, so to speak, on the coattails of reputable investigators." If it should be true that we are riding on the coattails of our more conservative predecessors, one thing is certain: The ride is the most joyful and exhilarating experience that any scientist has ever had.

In a recent review of volume 50 of this *Handbuch* (*Astrophysik*, I. Sternoberflächen, Doppelsterne), I expressed the opinion that the purpose of an encyclopedia is to present a broad and comprehensive treatment of all fields of a particular discipline and of their interrelations, and that in this respect it should differ significantly from a series of unrelated summarizing articles. I felt that this particular purpose of the encyclopedia had perhaps not been fully achieved in volume 50, even though the quality of the individual contributions could, with very few exceptions be characterized as excellent [see *Z. Astrophys.* **45**, 239 (1958)]. Volume 51 does not elicit this criticism. It is, without doubt, the most important book on general astrophysics that has ever been written, and it can be recommended to astronomers and physicists as the most authoritative account of observational and theoretical astrophysics.

The individual chapter headings are as follows: "Stellar interiors," by Marshal H. Wrubel (in English, pages 1–74); "The Hertzsprung-Russell diagram," by H. C. Arp (in English, pages 75–133); "Stellar evolution," by E. M. Burbidge and G. Burbidge (in English, pages 134–295); "The abundances of the elements in the planets and meteorites," by H. E. Suess and H. C. Urey (in German, pages 296–323); "The abundances of the elements in the sun and stars," by L. H. Aller (in English, pages 324–352); "Variable stars," by P. Ledoux and T. Walraven (in English, pages 353–604); "Stellar stability," by P. Ledoux (in English, pages 605–688); "Magnetic fields of stars," by A. J. Deutsch (in English, pages 689–722); "The theory of white dwarfs," by E. Schatzman (in French, pages 723–751); "The novae," by C. Payne-Gaposchkin (in English, pages 752–765); and "Supernovae," by F. Zwicky (in English, pages 766–785). The volume closes with a subject index in German-English, English-German, and French (the entries in French refer only to the article by Schatzman).

As an observational astrophysicist I was especially interested in the articles by Arp, Aller, Deutsch, and Zwicky, and by Walraven's section on the observational results on variable stars. But the "nucleus" of this volume is probably the magnificent chapter by the Burbidges. The theories of variable stars by Ledoux, of white dwarfs by Schatzman, and of magnetic stars by Deutsch will enable me (and probably many others) to interpret our observations in the light of modern physical theory. I believe that the chapter on "Stellar interiors" is somewhat too short to fully satisfy the reader. Perhaps the author was not given enough space to develop this field adequately.

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The Fearful Choice. A debate on nuclear policy conducted by Philip Toynbee, Wayne State University Press, Detroit, Mich., 1959. 112 pp. $2.50.

Philip Toynbee has prepared an interesting debate on nuclear policy by throwing an almost-pacifist challenge to a wide assortment of his high-placed British friends and by collecting and commenting on the essays they sent in reply. He starts by recognizing the great changes that the nuclear scale of destruction has brought about, and most of his correspondents go along with him on that. To the ringing words, "It is inconceivable that the free peoples would sur-