Astronomy textbooks

David W. Hughes

The Solar System. By J.A. Wood. Pp.196. (Prentice-Hall International: Hemel Hempstead, UK, 1979.) £5.05. *Galaxies: Structure and Evolution.* By R.J. Tayler. Pp.203. (Taylor and Francis Wykeham Publications: London and Basingstoke, 1979.) Paperback £4.50. *The Astrolabe.* By H.N. Saunders. Pp.12. (Science Studio: Oxford, 1979.) £4.75. *Projects and Demonstrations in Astronomy.* By D. Tattersfield. Pp.331. (Stanley Thornes: Cheltenham, UK, 1979.) *Astronomy: Activities and Experiments.* By L.J. Kelsey, D.B. Hoff and J.S. Neff. Pp.187. (Kendall/Hunt: Dubuque, Iowa, 1979.) *Activities in Astronomy.* By D.B. Hoff, L.J. Kelsey and J.S. Neff. Pp.142. (Kendall/Hunt: Dubuque, Iowa, 1979.) *Astronomy: From the Earth to the Universe.* By J.M. Pasachoff. Pp.200. (W.B. Saunders: Philadelphia, London, Toronto, 1979.) (Plus *Teachers Guide.*) *Exploring the Cosmos.* By L. Berman and J.C. Evans. Second edition. Pp.89. (Little, Brown: Boston and Toronto, 1979.) (Plus *Instructor's Manual.*) *The Macmillan Dictionary of Astronomy.* By V. Illingworth. Pp.378. (Macmillan: London and Basingstoke, 1979.) £8.95.

THIS year's crop of astronomy textbooks can be easily sorted into three groups which, for want of better, can be labelled advanced, experimental and simple.

Two books fall into the advanced section; both are on specific astronomical topics and both are aimed at the second- and third-year university undergraduate. Both are excellent in their own way and both are extremely good value for money. The first is *The Solar System* by John A. Wood, an ideal introduction for all astronomy, geophysics and physics students. Wood had an extremely difficult job in front of him — express in about 50,000 words and 125 figures what you think is of major importance in the Solar System. Now one easy way out is to isolate the planets from the Sun and the neighbouring stars in the Galaxy. Wood didn't do this, thank goodness, and this makes the book even more praiseworthy. He also decided to discuss, chapter by chapter, the unifying features of planets. So we don't get a chapter on each and an insulation of our knowledge of a single planet from the overall picture. Wood considers broad topics, the motions of planets and their interrelations, the surfaces and their evolution, planetary interiors and atmospheres, rocks from space (meteorites and lunar samples), the Sun, solar evolution and the origin of the elements and finally the origin of the Solar System. This book is going to be a firm

Particle physics

Norman Dombey

Elementary Particle Physics. By D.C. Cheng and G.K. O'Neill. Pp. 423. (Addison-Wesley: Reading, Massachusetts, 1980.) \$29.50.

THIS is a very nice brief introductory text to the subject with roughly half devoted to electromagnetic and weak interactions and half to strong interactions. It is up to date: not only does charm enter together with strangeness in Chapter I but even the SLAC experiment of summer 1978 showing parity violation in electron scattering is quoted.

Nevertheless, the book is solid rather

favourite in universities for years to come. Maybe in the next edition Wood could help the lecturer out when it comes to tutorial and exam time by including a set of questions. Also the suggestions for further reading are a bit dated.

The second advanced book is *Galaxies: Structure and Evolution* by R.J. Tayler, a new title in the excellent *Wykeham Science Series*. Despite their intended aim — to bridge the gap between school and university studies — this book is again at mainstream second- and third-year university level. It is an excellent companion to Tayler's other two books in the series, *The Stars: Their Structure and Evolution* and *The Origin of the Chemical Elements*.

Galaxies are getting more and more popular in astronomy possibly because the number of known galaxies is increasing considerably as telescope instrumentation becomes more sophisticated. I never cease to be amazed at the statistic that there are about as many galaxies in the Universe as there are stars in our own Galaxy. Tayler doesn't cut corners in his book. Galactic properties are discussed with physical and mathematical precision. Considerable emphasis is given to the one galaxy that has been observed well, the one we are in, and there are chapters on observational results, stellar dynamics and the interstellar medium. Careful consideration is also given to the problems of estimating galactic mass and size and assessing the effects of chemical evolution. Other chapters deal with the different classes of galaxies and the origin and evolution of galaxies and the Universe.

This book will make galactic astronomy more accessible to many students and Professor Tayler is to be well congratulated for this.

Finally in the advanced section we have *The Astrolabe* by H.N. Saunders, a plastic folder which contains a 12-page booklet and an assembled, 14.5-cm diameter, white

than fashionable and in spirit belongs to the late 1960s and early 1970s (this is not meant as a criticism) rather than the present. C,P and T-invariance; SU(3), (4) and (6); form-factors and structure functions; quarks and partons; dispersion relations and Regge Poles are all treated in some depth. Gauge theories are mentioned but not explained; so is the unification of weak and electromagnetic interactions; but QCD perhaps wisely is absent.

I will certainly recommend the book to my students, both undergraduate and graduate. There are, however, several errors in the text of the edition I received which need correcting. □

Norman Dombey is Reader in Physics at the University of Sussex, Brighton, UK.

and clear plastic astrolabe. The astrolabe was invented in Alexandria around 400 AD and was used by astronomers for over 1,200 years. It gives the times of rising and setting of the Sun and certain specific stars throughout the year and their positions in the sky (that is, altitude and azimuth) at any time of the day and night. The astrolabe in the Saunders package has been designed for use at latitude 50° North but will still give useful answers within two degrees or so of this. If you want to know how astrolabes work and wish to become acquainted with such terms as retes, rules, plates, tympan, almucantars, heliacal risings and alidades this is just for you. There are 32 stars on the plate and the booklet is clearly written and contains many worked examples of astrolabe uses. The Saunders instrument is well made, durable and will stand up to a considerable amount of student handling. It would provide the basis of a very reasonable laboratory experiment for the more historically minded. A brief comparison can be made with another astrolabe package. In 1974 Roderick S. Webster produced an 8¾" diameter, six section astrolabe kit, printed on gold cardboard and die cut so that the sections press out and don't have to be cut out (in 1974 it was \$18 and obtainable from Paul MacAlister and Associates, Box 157, Lake Bluff, Illinois 60044). Six plates were included, for latitudes 30, 36, 42, 49, 52 and 56° North. It was decorated to conform with Renaissance practice. Webster's astrolabe looks more like 'museum' examples but is much more fragile than the smaller plastic Saunders one. Webster's booklet did stress the historical aspect more and had an excellent bibliography.

Let us now turn to the experimental aspects of astronomy. Like many other sciences, astronomy is both practical and theoretical and the majority of students studying the subject spend a considerable