A big surprise


In 1996 I first heard of the plan to produce this four-volume work, and in 1997 I received an invitation, which I declined, to join the editorial team. At the time I was exceedingly sceptical about the feasibility of achieving a quality product on a reasonable timetable. Though I have reservations about the finished work, I am pleased to write that the editors, authors and joint publishers have done better than I then thought likely. They deserve congratulations.

It has been a huge undertaking. There are four volumes—on paper—and more in electronic form, spanning all aspects of astronomy and astrophysics. Material is presented as 2750 articles, 700 of them covering topics in depth, together with shorter pieces on people and institutions of note. The publishers describe it as “an essential source of information for undergraduates, graduate students, researchers and seasoned professionals, as well as for committed amateurs, librarians and lay people”.

A particularly relevant question concerns the motivation for undertaking such a work. Also in 1996, I was asked by the then president-elect of another major academic publisher, who was unaware of the IoPP/Macmillan plans, whether his organization should pursue a comparable endeavour. He explained that a wide range of librarians feel comfortable in this age of budgetary pressure, to buy such a publication. Interaction with my own department’s very able and exceedingly helpful contact librarian about the Encyclopedia has confirmed what he said. So a publisher gets involved with huge organizational problems because even schools and public libraries are possible purchasers. The number that I heard handled about for the budget of this project is about £1m. Given that the total sale of an astronomical book is usually about several tens of thousands of pounds, relatively big money was invested in the volumes under review. By the way, the princely sum that I was offered was $100; obviously, the publishers consulted a government minister to get an idea of what an academic’s time is worth.

Though sales will be huge by astronomical publishing standards, who is likely to use the Encyclopaedia? I certainly enjoy skimming articles by friends who, given the space limitation, have fulfilled their briefs remarkably well. However, I have learned nothing that I did not already know. So who can advance their knowledge through these articles? In many cases, “no-one” may be the disappointing answer. First-year university students writing end-of-year general essays may find some of the articles useful, but the most interesting will be far beyond them. More advanced students should be expected to go to articles in the Annual Review of Astronomy and Astrophysics, books presenting introductory but detailed, rigorous expositions, and a few articles in current refereed journals. A good introductory undergraduate-level overview of astronomy and astrophysics would probably be at least as useful as the Encyclopedia as a source for the broad background information that one might need in order to appreciate an Annual Review article.

I would like to see a successful realization of a rather different type of work. Rather sizable parts of astronomy must be described in a volume of a couple of hundred pages primarily aimed at the presentation of the study of cosmic phenomena from any of a variety of perspectives. For instance, any book on “X” in astronomy where “X” may signify “molecules”, “winds”, “magnetic fields”, “spectroscopy”, “nuclei”, or “relativistic particles” would cover a rich range of astronomical sources. In addition, such a book would illustrate that a good basic idea or a small set of interrelated mechanisms touches a lot of different lines of investigation and would, thus, communicate an appreciation of a perspective, something that is totally absent in the Encyclopedia. I would really like to see a well-written, well-edited, well-produced series of such books. However, I would pity any publisher who would try to find the authors for such a series, as, despite the number of people capable of writing fascinating overviews, they are all so busy that making a commitment to such a project would probably interfere with the completion of the tedious tasks that some administrators deem more valuable than scholarship.

Perhaps the idiosyncratic nature of this review is inspired by the rather amusing choice of people to whom small articles are devoted. As the Encyclopedia’s electronic version will be revised continuously, the publishers have the opportunity to try to recognize some great astronomers. Of course, some are already the subjects of short entries, but overall the list of the scientists so honoured is the consequence of an expert level of thoughtlessness. The decision to have articles on minor institutions with words like “observatory” in their names while departments with much more significant histories or current programmes are mentioned is bewildering. Many omissions, such as the absence of a thorough article on the Kleinmann–Low Nebula, and redundancies, including an entry on the “Inflationary Universe” immediately following a well-written article on “Inflation” by A. Linde, are surprising. Short pieces on each of the Messier objects compensate for some failings; they are particularly useful for a theoretician.

Despite my criticisms, the work represents quite an achievement of organization. Surely the better students who will see it will gain an impression of the richness of astronomy and astrophysics; I hope that they will be inspired.

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A pinch of salt?


This compact book has been revised to accommodate the changes to the new GCSE astronomy syllabus which will be first examined in 2003. The 25 brief chapters are written in Patrick Moore’s immediately recognizable matter-of-fact style. These are generally well aligned with the requirements of the new syllabus and will provide useful background reading. Explanations of astronomical concepts such as “mean sun” and the leap year are clear and concise. However, the sections on seasons, black holes and cosmology are unnecessarily brief, with insufficient detail for higher grade candidates. Each chapter ends with revision questions to check that the material has been read and understood. These are unlike the format of the GCSE papers so the candidate will need more practice than these afford. This is especially true of numerical work with Kepler’s Laws and Newton’s Law of Gravitation, given only one example each.

The authors have unfortunately missed the opportunity to bring the units of measurement in line with the Systèmes d’Unités (SI) convention used throughout the scientific world and also by GCSE. While inches are always followed by the equivalent in cm, this makes for confusion in calculations and for clumsy text. Also “sec” should be “s” and “km per second” should be “km s⁻¹”. Angstrom units are superfluous at this level.

The practical requirement of the new syllabus is well supported by guidelines on making a sundial or a simple refractor or projecting an image of the Sun to study sunspots. Some unguided photographic work would have been a useful addition. A serious drawback to this new edition is the large number of errors both in the text and in the diagrams. Many of these arise from poor typesetting, such as the fifth root of 100 and the reversal of the conversion factors from metres to feet. Also there are errors in the answers to numerical questions, which will confuse many students wrestling with right ascension and hour angle. Mistakes in the diagrams include the wrong labelling of amplitude (in figure 34) and the labelling of the light curve of delta cephei in hours instead of days. The eclipse diagrams should have arrows on the light rays. Some of the other figures are poorly or ambiguously drawn. More worrying is the number of scientific mis-takes in the text, for example RA and azimuth are confused (page 52) and the VLA is given 80 telescopes when it should have 27.

Despite this, the book has a place in a subject where there is very little reference material specifically for GCSE. As a supporting text it has much to offer student and teacher as long as both are wary of accepting details at face value. Anne Cohen is an ex-Jodrell Bank radio astronomer who preceded Alan Pickworth as President of the Association for Astronomy Education and is currently teaching physics and astronomy at The King’s School, Macclesfield.