

Reviews

The Victorian Amateur Astronomer. Independent Astronomical Research in Britain 1820-1920, by Allan Chapman (Wiley-Praxis Series in Astronomy and Astrophysics, John Wiley & Sons, Chichester, 1998), xx + 428 pp., ISBN 0-471-96257-0, cloth £40, 245 x 172 mm.

The nineteenth century was a time of remarkable change in astronomy, particularly late in the century when "new astronomy", astrophysics, was beginning to eclipse positional astronomy. Amateur astronomers world-wide played a key role in these developments, and this book brilliantly portrays the role of Britain in all this.

Allan Chapman is well-known for his numerous research papers on the history of astronomy, and this sizable tome is an important contribution to the subject. In his Preface, Chapman explains that he is interested in "... tracing the history of a scientific movement within nineteenth-century British society ..." and that he has four inter-related factors in mind:

- to write primarily about astronomers rather than about astronomy *per se*;
- to relate these astronomers to the social and financial worlds in which they lived;
- to examine the development of ideas in nineteenth-century astronomy and see how amateur astronomers were involved in advancing understanding of the universe; and
- to chart advances in instrumentation.

Chapman then proceeds to assign his material to three different Parts.

Part 1, titled "Grand Amateurs", examines the contribution made by "... those independently wealthy individuals who took upon themselves the reform and advancement of British astronomy at the highest technical and intellectual level." After two introductory chapters which set the professional astronomical "scene" so to speak in Britain and Europe, we are introduced – in Chapman's easy writing style – to many familiar names, including Carrington, Cooper, Dawes, De La Rue, Groombridge, Lee, Sir John Herschel, Sir William Huggins, Lockyer, Pearson, W H Smyth and his son, Sir James South, and the telescope-makers, Common, Lassell, Nasmyth and William Parsons, the Third Earl of Rosse. Ending this account is a chapter about those oft-forgotten professional assistants to the Grand Amateurs. Part 1 occupies 157 pages of this book, and obviously a separate book could be written about each of the above astronomers and telescope-makers (and some already have been), but those seeking further information and wishing to follow up particular individuals or themes are well served with a detailed and copiously-referenced "Notes and references" section.

One of the things I found particularly refreshing about Chapman's approach was his decision to include Parts 2 and 3 of this book. Collectively they encompass a little over 140 pages, and are respectively titled "Poor, obscure and self-taught: astronomy and the working class" and "The rise of the leisured enthusiast".

In his Prologue to Part 2, Chapman explains that astronomy had a lively following among the working classes, but that "Because there were no social forums or journals to which they had easy access, and because their overall social position was one in which literary record was not necessary for daily survival ... [their] activities are extremely patchy in their documentary remains." After a chapter on "A penny a peep: the astronomical lecturers of the people", we are introduced to seven case studies of modest astronomers: a baker, a blacksmith, a cobbler, a ploughwright, a railway porter, a slate counter and a station master. The trials and tribulations of pursuing an amateur astronomical "career" within the context of limited means and opportunity certainly come through.

Part 3 deals with the late nineteenth century and what Chapman identifies as "... a new type of amateur astronomer... People of more modest fortune and ambition. They were what might be called the 'leisured enthusiasts'." Supplying this new breed of amateur astronomer with information were people like Ball, Proctor and Webb, while their instrumental needs were satisfied by Calver, Cooke and With, amongst others. To Chapman's way of thinking, Cooke and America's Alvan Clark "... barged as bulls into the optical china shop and brought in their wake those refreshing winds of change which shook up old monopolies, old technologies, and old pricing policies to bring the refracting astronomical out of the closet of exclusiveness." Also serving the burgeoning population of British amateur astronomers were the earliest formal groups: the Leeds, Liverpool, Manchester, Newcastle-on-Tyne and Ulster Astronomical Societies, the Astronomical Society of Wales and the British Astronomical Association. A notable feature of these societies was the admission of women to membership, and as a consequence the late nineteenth century saw increasing numbers of women amateur astronomers rising to prominence in Britain. In Chapter 14, titled "Now ladies as well as gentlemen", Chapman discusses the achievements of Elizabeth Brown, Agnes Clerke, Mary Evershed (née Orr), Agnes Giberne, Lady Huggins, Annie Maunder and Mary Proctor, and a number of others whose names are not so widely known.

A concluding chapter succinctly brings us up to date by reviewing contemporary British amateur astronomy.

One of the things that makes Chapman's account of nineteenth century astronomy so entertaining is the inclusion of numerous quotations throughout the book. Some of these are simply delightful: imagine the unidentified sailor at a Tyneside barber's shop during the 28 July 1851 total solar eclipse who explains to a woman present: "Oh, it's only the moon, ma'am, that broke adrift and got athwart the sun. It'll all be right by-and-by, if the old boy [God!] only puts the helm hard over" (page 172), or a London contemporary, Mr Tregent, describing the challenge of making telescope objectives: "Men have been known to go and throw their heads under waggon wheels, and have them smashed, from being regularly worn out with working an object glass, and not being able to get the convex right." (page 175). And on page 34 we read of Airy's disdain for astronomical observation: "The lowest of all employments in the [Greenwich] Observatory is mere observation. No intellect and very little skill are required for it. An idiot with a few days' practice may observe very well". Hardly wanting to be branded an idiot himself, is it little wonder that the distinguished Astronomer Royal left the observing to others?

In addition to quotations, the book is well illustrated, with 80 different black and white plates. Although some are well-known images, there are others that I do not recall having seen in print previously. But if I have one concern – and it is only a slight one – it is with the placement of these plates. Rather than incorporating them within the text, they have been grouped in 8-page lots at four different places throughout the book. This was presumably done in the interests of cost, but I found it a little inconvenient.

It is to be expected that a book exceeding 400 pages will include some errors, but in this instance they appear to be few and far between. However, the first magnitude southern star, Alpha Centauri, could hardly be described as "visually dim" (p.42), and the Great Melbourne Telescope (known as the "GMT" in Australian circles!) was pressed into service at Melbourne Observatory in 1869 rather than 1874 (p.109).

Yet these are minor concerns, and I think this is an excellent book. Obviously, the focus is on England, but by using it in conjunction with other works (including Ashbook's *The Astronomical Scrapbook* and Clerke's *A Popular History of Astronomy During the Nineteenth Century*) one can quickly gain an international perspective, and at the same time come to appreciate the immense contribution that was made by the British amateur astronomer to positional astronomy *and* astrophysics during the period 1820-1920.

The final assessment? I thoroughly enjoyed reading this book, and recommend it to others. It is excellent value at £40, and deserves to be on the bookshelf of every astronomer with an interest in nineteenth century astronomy or the role of the amateur in world astronomy. I believe that this book will long remain a standard text for historians of astronomy.

Wayne Orchiston

Mapping and Naming the Moon: A History of Lunar Cartography and Nomenclature, by Ewen A Whitaker (Cambridge University Press, Cambridge, 1999), xix + 242 pp., ISBN 0 521 62248 4, cloth £37.50, , 253 × 195 mm.

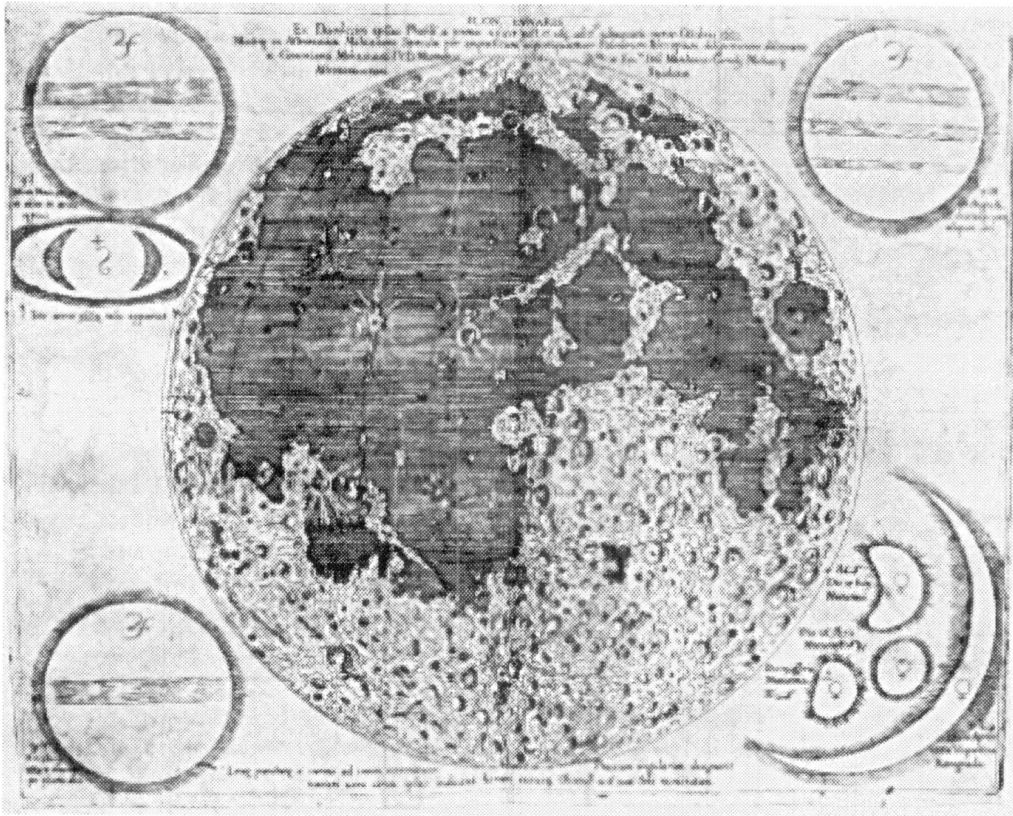
The markings on the face of the Moon are visible to the naked eye and have been known since antiquity. Telescopic study of the Moon and more recently its exploration by spacecraft have revealed ever more detail. There is a similarly long history of naming lunar features. *Mapping and Naming the Moon* tells the sometimes circuitous story of lunar mapping and nomenclature.

The treatment is chronological. It starts with the 'Man in the Moon' and other images traditionally seen in the lunar disc. There were a couple of pre-telescopic drawings by Leonardo da Vinci and William Gilbert. However, the first drawings from telescopic observations were made by Galileo Galilei and Thomas Harriot around 1610. Whitaker convincingly refutes the common idea that Galileo's original drawings were crude and that the features in them cannot be identified.

The first detailed lunar nomenclature was introduced by Van Langren in his map of 1645. Modification of his names was forbidden by Royal Decree under pain of incurring the 'indignation' of the King of Spain. Nonetheless, two entirely different systems of nomenclature appeared within six years. One was introduced by Helvelius in his *Selenographia* of 1647. The other was due to Riccioli and Grimaldi and appeared in the *Almagestum Novum* in 1651. These two different systems persisted in parallel for about one hundred and forty years and it is the Riccioli and Grimaldi names which form the basis of modern nomenclature.

Maps of increasing complexity and detail were produced by Mayer, Schröter and, in the nineteenth century Lohrmann, Beer and Mädler, Schmidt, Neison, and others. Most of these authors introduced additional names. By the start of the twentieth century lunar nomenclature had degenerated into chaos with many features enjoying multiple names and different authors applying the same name to different features. A determined effort at standardisation was made by *inter alios* Saunder, Turner, Müller and, in particular, the indefatigable Mary Blagg. This effort resulted in the *Named Lunar Formations* of 1935, a definitive list of standard names which was adopted by the IAU. Perhaps surprisingly, there was similar confusion during the late 1960s and 1970s when the nomenclature was extended to the far side and smaller features because of exploration by spacecraft. However, again standardization by the IAU ultimately restored order.

The author, now retired, was latterly a selenographer at the Lunar and Planetary Laboratory, Tucson, and was, for many years, heavily involved in American programmes to map the Moon. He is uniquely well-qualified to tackle the subject. The book is well written and produced. Detailed lists of the feature names used by different authors are given in appendices. Similarly, representative references for each chapter are listed in an appendix. This approach leaves the main body of text uncluttered and easy to read. The book is profusely illustrated and the figures chosen with care. They virtually all show the lunar maps and drawings being described and many would otherwise be difficult to find.



Map of the Moon published by Geminiano Montanari in 1662 (see *Mapping and Naming the Moon*. The drawings in three of the four corners show sketches of the cloud bands of Jupiter (see *Galileo's Planet*).

I suppose the book most similar to Whitaker's is *Mapping of the Moon* by Z Kopal and R W Carder (1974, D Reidel, Dordrecht). However, this latter is now over a quarter of a century old, and has a different emphasis; only its first chapter is really similar. It is pleasing to see the development in knowledge of early lunar mapping during the period between them: one of the drawings of the Moon by da Vinci which Kopal and Carder thought lost is reproduced by Whitaker. The book is detailed, comprehensive, authoritative and likely to become the definitive work on the subject. I enjoyed reading it and learnt a lot: it can be recommended to anyone interested in selenography or the history of lunar observation.

Clive Davenhall

Galileo's Planet: Observing Jupiter Before Photography, by Thomas Hockey (Institute of Physics Publishing, Bristol and Philadelphia, 1999), xvii + 217 pp., ISBN 0 7503 0448 0, cloth £29.95, US\$49.50, 241 × 165 mm.

The cloud bands of Jupiter are visible through even a small telescope and are some of the most obviously variable phenomena in the solar system. *Galileo's Planet* is a survey of the historical observations of these features from the invention of the telescope until photography was applied to astronomy in the last few decades of the nineteenth century.

An introductory chapter sets the scene with a summary of what is now known about Jupiter and a description of the modern BAA nomenclature for the belts and zones. Thereafter the treatment is largely chronological. A short second chapter covers pre-telescopic observations. However, the story really starts with the application of the telescope to astronomy by Galileo Galilei in 1610. The disc and

major bands were soon recognized, as were satellite shadows crossing the disc. Later the first isolated spots were discovered by Campani, Hooke, and Cassini. A chapter describes these important seventeenth century advances. The following chapter covers the eighteenth century, though there was little further progress: only a few astronomers were interested in Jupiter and the focus of astronomy was elsewhere.

Three chapters, about half the book, cover the nineteenth century. During this period knowledge of the morphology of Jovian atmospheric features increased greatly. A number of factors contributed to this progress: certainly there were better telescopes and more observers. Moreover, astronomers began to work co-operatively, sharing results through the new medium of single-discipline journals. As the century progressed it became apparent that isolated, intermittent observations were not adequate to understand the transient and time-varying phenomena occurring in the Jovian atmosphere. Systematic sequences of observations were required, ultimately leading to continuous monitoring programmes, the descendants of which continue to this day. Interest in Jovian atmospheric features was stimulated by the equatorial reddening around 1870 and the appearance of the Great Red Spot in 1878. The book's coverage ends at about 1880.

The penultimate chapter covers theories of Jupiter from the beginning of the seventeenth to the end of the nineteenth centuries. During this time models which saw Jupiter as broadly a 'large Earth' gave way to ones in which it was a 'small Sun'. The final chapter tidies up a few loose ends, including considering who the Jupiter-watchers were and where they worked. Before the introduction of photography the only ways of recording morphological features were drawings and written descriptions. A discussion brings out the strengths and limitations of each technique and is amply illustrated by the numerous figures throughout the book (all in black and white apart from the frontispiece, though this is no great detriment). One problem was that the planet was faster than the pencil: Jupiter's rapid rotation, coupled with foreshortening towards the limb, transported features out of view before all the detail visible could be recorded.

The author is an Associate Professor at the University of Northern Iowa and has written about historical observations of Jupiter for many years. His book is well written and produced. It is comprehensive, detailed and thoroughly referenced. It complements the two modern syntheses of terrestrial observations of Jupiter: Peek's *The Planet Jupiter* (1958, Faber and Faber, London) and Roger's more recent *The Giant Planet Jupiter* (1995, Cambridge University Press, Cambridge). It can be recommended to both historians of planetary observation and Jupiter-watchers alike.

Clive Davenhall

Eyes on the Universe. The Story of the Telescope, by Patrick Moore (Springer, London, 1997), viii + 120 pp., ISBN 3 540 76164 0, paperback £9.95, 234 × 155 mm.

Patrick Moore is so well known to astronomers, amateur and professional alike, and many of us who are now in our fifties were inspired to pursue a career in this noblest of sciences as a result of reading *Guide to the Moon*, *Guide to the Planets*, and other "favourites". This is one of Patrick's strengths: his ability to produce readable astronomy books, on innumerable topics, decade after decade. *Eyes on the Universe* is his latest work on the history of optical telescopes, and was published to mark the fortieth anniversary of his world-record television programme, "The Sky at Night".

In just 120 pages we are taken on a chronological tour from pre-telescopic times, via familiar figures like Galileo, Newton, Sir William Herschel, and the Third Earl of Rosse, the "great refractors" of the nineteenth century, and reflectors associated with George Ellery Hale, to "recent" telescopes (including the 6-m Russian reflector, the Anglo-Australian Telescope, the Isaac Newton and William Herschel Telescopes, the various instruments at Cerro Parañal, La Silla, Cerro Tololo and Las Campanas in

Chile, and the two 10-m Keck reflectors and other telescopes on Mauna Kea). The final chapter takes us beyond the Earth, by introducing the Kuiper Airborne Observatory, satellite telescopes and the Hubble Space Telescope. Completing the book are two Appendices; the second of these is titled "Some Great Telescopes", and it is a sign of how quickly the state-of-play changes that most of the very large instruments listed there as "Telescopes in preparation" are now operational.

Obviously individual books could be written about many of the telescopes mentioned in this book (and some already have been), but Patrick has done a good job in producing a general introduction. Nor has he attempted to gloss over some of the controversies or uncertainties surrounding certain instruments and individuals, such as the roles of Robert Grosseteste, Leonardo da Vinci and Leonard Digges in the invention of the telescope. On the other hand, given the demands of brevity, there is no Bibliography, or even a list of "Further Reading".

One of the positive features of this little book is the large number of high quality colour photographs scattered through the text. But if I have one minor quibble it is that greater care was not devoted to checking the captions. Indeed, the very first one, on the Acknowledgements page, shows the author posing beside one of his smaller reflecting telescopes, not the 15 inch (38.1 cm) that is mentioned in the caption! On page 32, we read of Herschel's "40-foot refractor"(!), while on page 80 the lower photograph actually shows the dome of the Auckland Observatory's 50.8-cm Zeiss reflector and not "... the Mount John reflector in New Zealand".

These concerns aside, in an age when it is typical to pay more than £25 for an astronomy book, it is a pleasure to find a volume - albeit a slim one - at what can only be described as a "bargain basement price". *Eyes on the Universe* is good value, a good read, and yet another worthwhile product from the prolific pen of Patrick Moore.

Wayne Orchiston

Other books received

Seven Wonders of the Cosmos, by Jayant V. Narlikar (Cambridge University Press, Cambridge, 1999), x + 324 pp., ISBN 0 521 63898 4, paperback AU\$34.95, ISBN 0 521 63087 8 cloth AU\$110.00, 228 × 152 mm.

Using simple analogies and a wealth of illustrations, the author skilfully steers the reader through a cosmic journey of discovery from Earth to galactic distances. Each of the seven wonders represents a range of mysterious phenomena, a class of spectacular events, or remarkable cosmic objects which have challenged human curiosity.

The Cambridge Concise History of Astronomy, edited by M. Hoskin (Cambridge University Press, Cambridge, 1999), 362 pp., ISBN 0 521 57600 8, paperback AU\$48.95, ISBN 0 521 57291 6, cloth AU\$125.00, 250 × 175 mm.

Concise is the operative word for it appears to contain more material than the editor's *The Cambridge Illustrated History of Astronomy* of 1997. Each of the authors does a thorough job with their respective chapters.

The American Astronomical Society's First Century, edited by David De Vorkin (American Astronomical Society, Washington, DC, 1999), 350 pp., ISBN 1 563 96683 2, cloth US\$45.95, 285 × 220 mm.

While not as old as the Royal Astronomical Society, this prestigious society celebrated its centenary in 1999 September. Both societies had humble beginnings with fifty astronomers meeting at Yerkes Observatory and today over a thousand attend the annual meeting. Well illustrated, this volume tells the story of people rather than science.

Worlds Without End, The Historic Search for Extraterrestrial Life, by Roger A. S. Hennessey (Tempus Publishing, Stroud, 1999), 160 pp., ISBN 0-7524-1450-X, cloth £18.99, 254 × 178 mm.

Covers the contributions of philosophers, theologians, and scientists over the past 2500 years, for example, Plato, Aquinas, Newton, Kant, Paine, Wells, Hoyle, and Crick. Well illustrated, the book reveals that much of what is considered new today turns out to be old and well worn.

Aiming for the Stars, The Dreamers and Doers of the Space Age, by Tom D. Crouch (Melbourne University Press, Carlton, 1999), xiii + 338 pp., ISBN 0 522 84885 0, cloth AU\$45.00, 233 × 157 mm.

A history of the space age from sixteenth-century astronomers and philosophers to the present-day astronauts. It links the individuals of space travel with the political events and social currents which surrounded them, to paint a complete picture of four centuries of vision and action in space exploration.

Guido Horn d'Arturo e lo specchio a tasselli, edited by Marina Zuccoli and Fabrizio Bònoli (Cooperativa Libreria Universitaria Editrice Bologna, Bologna, 1999), 103 pp., ISBN 88-491-1292-0, paperback, 240 × 170 mm.

Reprints of nine of d'Arturo's papers relating to multi-mirror telescopes from 1932 to 1966 together with introduction and short biography (Un insigne maestro) make this an interesting read. A fuller story of his astronomical and cultural life was published by CLUEB in 1994, *Guido Horn d'Arturo, astronomo e uomo di cultura*.

From Galaxies to Turbines, Science, Technology and the Parsons Family, by W Garrett Scaife (Institute of Physics Publishing, Bristol, 2000), xvi + 579 pp., ISBN 0 7503 0582 7, hardcover £35.00 US\$45.00, 240 × 160 mm.

Covering some 125 years, Scaife relates the story of the Parsons family and their roles from astronomy to shipbuilding during the industrial revolution. Considered a world expert on the Parsons family, Scaife covers the period in great detail without going into too much technology.

Science in Translation, movements of knowledge through cultures and time, by Scott L. Montgomery (University of Chicago Press, Chicago, 2000), xi + 325 pp., ISBN 0-226-53480-4, cloth US\$28.00 £18.00, 235 × 158 mm.

Examines the role of translation in handing down and recovery of scientific texts during written history. Many examples are given showing the power of the translator to include his own interpretation, sometimes good, sometimes not so good. One example given is the translation of Newtonian physics into Japanese from a Dutch text, which in turn was a translation of the Latin text by John Keill.

The Astrophysical Journal, American Astronomical Society Centennial Issue, edited by Helmut A Abt (University of Chicago Press for the American Astronomical Society, 2000), ix + 1283 pp., ISBN 0-226-00185-7, cloth US\$50.00, 293 × 220 mm.

Fifty-two papers of this century from *The Astronomical Journal* and *The Astrophysical Journal* are presented. Each paper is accompanied by a commentary providing the scientific-historical context essential to comprehending its original impact.

