BOOK REVIEWS

***A Descriptive Catalogue of Greco-Roman Comets from 500 B.C. to A.D. 400*, by John T. Ramsey (Syllecta Classica Volume XV11, Classics Department, University of Iowa, 2006), pp. 242, paperback, US$20, 151 x 229 mm.**

Accurate historical records of comets are of considerable interest both astronomically and ethnographically. Astronomically they provide a vital clue as to the rate at which comets were entering the inner Solar System in ancient times; the acuity of the observers of those days; the significance they placed on certain temporal, positional and physical cometary characteristics; the paths of apparitions of long- and short-period comets; and the rate at which cometary absolute brightness decays. Ethnographically they help us understand the significance of these fleeting, randomly-occurring and startling bodies in the scientific and astrological mindsets of specific civilisations. The word astrology should be stressed for comets were portentous, or, in the context of the book under review, *magnarum calamitatum praenuntiae*. In those days, if you saw a new comet, you quickly looked around for something bad to happen, and the innocent comet usually got the blame. Ignoring the frailty of humanity, comets were supposedly responsible for such things as the suicide of Cleopatra, the madness of Emperor Commodus, the siege of Mutina, the battle of Actium and a more general host of assorted droughts, plagues, fires, earthquakes, storms, revolts and other unspecified calamities. Then, just as now, what was of paramount interest to the media was 'bad', as opposed to 'good', news. And comets had badness in spades.

John T. Ramsey is a classics scholar at the University of Illinois in Chicago, and he spent years scouring Greco-Roman literature for cometary references. The present catalogue concentrates specifically on the comets recorded over a 900-year period centred on 0 BCE. It has been built on foundations laid by previous cometary cataloguers such as Alexandre-Guy Pingré (1783), Wilhelm Gundel (1921), Anthony Barrett (1978), Donald Yeomans (1991) and Garry Kronk (1999). Like Barrett, for each listed comet Ramsey gives the full Greek or Latin texts, together with an English translation. He also adds astronomical details, references to other contemporary (mainly Babylonian and Far Eastern) information sources, historical contexts and a discussion of possible uncertainties. The latter include a detailed analysis of possible date conflicts (this being quite serious because if an account in a specific year gives one date and another, in the same year, gives a different date it is difficult to decide if one or two comets occurred at that time). Some of the reports are from contemporary witnesses and others are derived from later documents. In certain cases, where a comet is described many times, often only one of the accounts is first hand and Ramsey then lists the accounts in order of date of composition.

Throughout any analysis such as this there is the problem of original mis-description. It is sometimes not clear whether the ancient record refers to a comet, or a bolide, a meteor shower or a nova. This new catalogue, for example, contains 33 reasonably confident cometary records, 18 'maybe comets' and 22 'other things'. The problem, needless to say, lies with the recorders. The majority of cometary reports were simply 'dire omen' appendages to general historical narratives. If momentous events did not coincide with the cometary sighting the news reporter of the time ignored the comet altogether and it went unrecorded. Conversely, the importance of certain wars and changes of ruler were magnified by contemporary historians who simply invented a cometary appearance when none actually occurred. In fact only Aristotle, Pliny the Elder and the younger Seneca approached comets 'scientifically', as object worthy of study in their own right. Even then, the reports very rarely specify the season or month of the observation, and—unlike with Chinese records—the background constellation and direction of motion were usually ignored.

John Ramsey is to be congratulated on completing such a thorough and worthwhile task. The book is a joy to read and provides an illuminating window to historians of astronomy in general, and cometary science in particular. Like the reviewer, many historians of astronomy at school were forced to concentrate on mathematics and physics at the expense of Greek and Latin. To this end, Ramsey takes infinite pains with quotations and translations. These are augmented by detailed discussions in which facts and speculations are well separated. This is a work of impressive scholarship and will remain a useful reference for centuries.

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***The Sun Kings. The Unexpected Tragedy of Richard Carrington and the Tale of How Modern Astronomy Began*, by Stuart Clark (Princeton, Princeton University Press, 2007), pp. xii + 211, ISBN-13: 978 0 691 12660 9 (hardback), US$24.95, 165 x 242 mm.**

Although Richard Carrington's name is well known to solar astronomers as the first person to record one of those all-too-rare white light flares, I suspect that most of us know relatively little about him. So Clark's book is particularly welcome. Having said that, Clark does much more than flesh out Carrington the man and Carrington the astronomer, and this is reflected in the subtitle of the book, "The Unexpected Tragedy of Richard Carrington and the Tale of How Modern Astronomy Began".

Stuart Clark spreads his chronological net widely and wisely. After a brief introductory 'Prologue' which focuses on SOHO's exploits in 2003, he leaps back in time to 1859 for the first of twelve chapters, all but one of which deal with nineteenth century astronomy. Chapter 1 provides biographical information on Richard Carrington but it also documents the observation he made on 1 September 1859 that was to propel his name into the annals of astronomy. He was observing the Sun by the standard projection method from his private observatory at Redhill, Surrey, when at about 11:18 GMT he noticed

> Without warning, two beads of searing white light, bright as forked lightning but rounded rather than jagged and persistent instead of fleeting, appeared over the monstrous sunspot group ... As he stared, dumbfounded, the two spots of light intensified and became kidney shaped. (Clark, 2007: 12-13).

Auroral displays witnessed across Europe the following nights and a magnetic anomaly registered at Kew at this time convinced Carrington that his observation was important, and he proceeded to describe it at the 11 November 1859 meeting of the RAS, where corroborative observations by another British amateur astronomer, named Hodgson, were also presented. Both accounts subsequently appeared in *Monthly Notices of the Royal Astronomical Society*, and soon after Carrington was elected a Fellow of the Royal Society.

In the next three chapters, Clark sketches developments that took place in solar astronomy between the late eighteenth century and Carrington's era, thereby providing a chronological context for the 1859 observations. He

then returns to Carrington, outlining the nature of his solar program from 1852 to 1859, before embarking on the impressive auroral displays and magnetic storms experienced worldwide on 28/29 August 1859, introducing readers to the foundations of solar spectroscopy, and recounting Warren de la Rue's pioneering efforts in solar photography. All this time, Carrington was suffering a personal crisis as the demands of the family's brewing business left him less and less time to devote to observational astronomy. On 24 March 1861 he made his last solar observation and less than four months later the instruments at his Redhill observatory went on sale. The 'unexpected tragedy' had materialized and Carrington was out of astronomy—but for a brief return in 1863.

The remaining chapters of this very readable book document progress in solar astronomy during the remainder of the nineteenth century, along with fascinating tidbits of Carrington's private life: his marriage to Rosa Rodway in 1869; her stabbing in 1871 by her lover, William Rodway (whom she passed off as her brother), and his attempted suicide; her death from a drug overdose in 1875; and Carrington's own death, by suicide, a few weeks later. There is also much about the strained relationship that existed between Carrington and that doyen of British astronomy, George Biddell Airy, and about Carrington's falling out with the RAS. In other words, *The Sun Kings* is about much more than mere solar astronomy.

I found this a fascinating book, and at just US$24.95 it is very sensibly-priced. I wholeheartedly recommend it to anyone interested in the development of nineteenth century astronomy or the emergence of solar physics.

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***The Telescope. Its History, Technology, and Future* by Geoff Andersen (Princeton, Princeton University Press, 2007), pp. 248, ISBN-13: 978 0 691 12979 2 (hard back), US$29.95, 165 x 242 mm.**

The telescope will be 400 years old in 2008, so be prepared to see a plethora of new books on the topic at your local bookstore. This book by Geoff Andersen is likely to be one of the best. Andersen starts the story rolling by explaining how vision works, and he then discusses early naked eye astronomy and the subsequent research that has been carried out since then. The main part of the book is Chapters 4 to 7, which explain the basic physics behind how a telescope works. Andersen goes into more detail and care than is usual in a book at this level, explaining the related concepts of diffraction, reflection and refraction, as well as what he calls "when good telescopes go bad", which is about the various aberrations that can and do affect a telescope. Chapter 7, on interferometry, is particularly well written.

For those thinking of building their own observatory, Andersen gives advice on site selection and related issues. Later parts of the book go into applications of the telescope outside of astronomy, including surveillance, laser communication and remote sensing. It is nice to see these other topics, since most books on telescopes usually focus solely on astronomical topics. There are also chapters on adaptive and active optics, and the final chapter is on telescopes of the future.

There are some nice illustrations which help explain the concepts discussed. I particular liked the two photographs of the so-called 'Face on Mars', which were used to demonstrate the effects of increased resolution. They were taken at different times, but under similar lighting conditions. The Viking Orbiter in 1976 shows the now famous 'face' which is absent from the higher-resolution photograph taken by the more recent Mars Global Surveyor Probe. However if you squint—or take off your spectacles—the 'face' re-appears!

There are very few mistakes that I spotted, although I am sure that the author in discussing spacecraft communication meant interplanetary not interstellar (p. 142).

The primary audience for this extremely reasonably-priced book is those amateur astronomers who want a more thorough than usual introduction to the telescope, and for them I thoroughly recommend it.

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***Living Among the Stars at the Johannesburg Observatory*, by Dirk Vermeulen (Johannesburg, Chris van Rensburg Publications, 2006). Pp. x + 134. ISBN 0 86846 107 5 (hardcover), R200+postage, 217 x 272 cm.**

When I was researching the life and times of R.T.A. Innes and his 1896 Cape Observatory appointment I had to make a hard decision: whether to include in my paper the fact that immediately before his departure Innes had his wife committed to a Sydney psychiatric hospital so that he could sail off to South Africa with his sons—and his mistress—or whether to focus solely on his astronomical achievements and leave out all mention of his hankering for heavenly bodies of a non-celestial kind. After discussing this delicate matter with Brian Warner I decided on the latter course of action, but I need not have worried for Dirk Vermuelen has included this fascinating trait of Innes' personality in his book about the Johannesburg (cum Transvaal, cum Union, cum Republic) Observatory. Innes, of course, was its founding Director.

So here we have an interesting book, with a very healthy mix of text and fabulous historical photographs that collectively document the history of the Observatory from its construction in 1904 to its close in 1971. Along the way, the rationale for the Observatory changed from meteorology to astronomy, as it acquired ever-larger telescopes, culminating in the 26.5-in Grubb refractor (which became operational in 1925, just eight years before Innes' death, at the age of 71).

Apart from Innes, there are also separate chapters on the subsequent Directors, H.E. Wood, W.H. van den Bos, W.S. Finsen and J. Hers, with information on their observational programs and other scientific achievements. We find, for example, that this Johannesburg observatory was responsible for the discovery of 148 new asteroids and 6,555 double stars (including Innes' identification of Proxima Centauri) and a handful of comets. We also learn about the Franklin-Adams photographic survey of the southern sky and that this observatory produced some the best ever Earth-based coloured photographs of Mars, taken in 1956 and 1969. There are also eight pages on the changing nature of the Observatory's time service, and several pages deal with the close links between Holland's Leiden Observatory and the Union Observatory, which led to the founding of a southern station in Johannesburg. Incidentally, it was Leiden University which awarded an honorary D.Sc. degree to Innes in 1924—interesting recognition, surely, for a man who never received any tertiary training! The book ends with 14 pages about the post-1971 history of the site, and a collection of eight appendices (one of which details Innes' research on variations in the Earth's rate of rotation).

This is a beautifully prepared and presented book, and it belongs on the bookshelf of every astronomer interested in the history of South African astronomy.

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