Radio astronomy has made enormous strides since Karl Jansky dramatically expanded our multiwavelength horizons seventy-five years ago. In August 2003 JENAM (the annual Joint European National Astronomy Meeting) held a symposium on “Radio Astronomy at 70: from Karl Jansky to microjansky” in Budapest to highlight advances in modern radio astronomy, and this book contains a set of invited review papers presented at that meeting (other papers having already been published in Baltic Astronomy, Vol. 14, No. 3, 2005).

This book is primarily of interest to astrophysicists, and contains excellent reviews of the CMB, extragalactic radio sources, deep field surveys, AGNs, extragalactic radio supernovae, Galactic and extragalactic magnetic fields, Galactic and extragalactic neutral hydrogen, radio emission from stars, pulsars, recombination lines, the ISM and Galactic masers; chapters on radio astrometry and on twenty-first century developments in instrument (including the Planck Mission, ALMA, LOFAR, the SKA, and space VLBI); accounts of the interface between radio astronomy and X-ray and gamma-ray astronomy; Gilmore’s short yet illuminating ‘outsider’s’ view on radio astronomy; and a final chapter where Parijiskj indulges in a little crystal ball-gazing in his “Radio astronomy: the next 70-year step”.

However, three historical chapters launch this book, and these will be of immediate interest to readers of this journal. In the first, F. Graham-Smith discusses “The early history of radio astronomy in Europe”, and although his canvass spans England, France, Germany, Hungary, the Netherlands, Norway and Russia, a mere thirteen pages is far too short a space to paint a detailed picture. Although it was pleasing to see photographs of some of the pioneers of European radio astronomy (e.g. Hachenberg, Hanbury Brown, Hey, Lovell, Ryle), I found the text rather superficial, based as it was (in large part) on data drawn from a small number of relatively well-known books. I have to admit that I came away feeling frustrated—Graham-Smith is a famous figure in British radio astronomy, and I was expecting much more.

Fortunately, the two following chapters provided better fare. In the first of these, Alastair Gunn discusses how the study of high-energy cosmic rays “... led to the establishment of Jodrell Bank as one of radio astronomy’s founding institutions.” In his text, Gunn uses published and archival sources to weave an intriguing tale of science, personalities and politics, extending from wartime radio research to early meteor work at Jodrell Bank, the development of the 218-ft transit instrument, and eventually the 250-ft radio telescope.

Bernard Burke’s 30-page chapter on “Early years of radio astronomy in the U.S.” provides further, welcome, intellectual sustenance. Jansky and Reber are well-documented by others (Sullivan, 1984, and Kellermann, 2005, respectively), so after quickly disposing of them, Burke introduces us to his early years in radio astronomy at the Carnegie Institution’s Department of Terrestrial Magnetism, well-known for the 22 MHz ‘Mills Cross’ that he and Franklin used to discover Jovian decametric emission. Drawing in his personal knowledge of the U.S. ‘scene’, Burke then discusses the January 1954 ‘Washington Conference’, which ultimately led to the formation of the NRAO. Along the way, personalities and politics entered the fray, including the power struggle between Merle Tuve and Lloyd Berkner that is deemed to have delayed the establishment of the NRAO by up to a year.

Burke then highlights developments by the early radio astronomy groups at Caltech, Harvard and the Naval Research Laboratory, before returning once more to the NRAO and the sagas surrounding the design and construction of the 140-ft and 300-ft radio telescopes. At the time, Burke was serving on the NRAO Advisory Committee, and he found the experience “... both painful and educational.” (page 41)! After a diversionary tale about the discovery of quasars (involving both Palomar and Parkes observations), Burke returns to the main theme and summarizes the Lincoln Lab’s development of its Haystack 120-ft dish, before discussing early research into the CMB by Penzias, Wilson and Dicke, and the lost Washington opportunity; had fate played a different hand, Burke believes that Hagen’s NRL group would have discovered the CMB back in the 1950s. Burke then brings his chapter to an end by discussing the concept of aperture synthesis, the torturous steps that led ultimately to the construction of the VLA, and early attempts at VLBI. All in all, I found this a masterful chapter, and it is a ‘must’ for anyone seeking a thumbnail sketch of early developments in U.S. radio astronomy. It covers considerable territory, and is enriched throughout by anecdotes and quotes that reveal Burke’s personal knowledge of—and, in many cases, his direct involvement in—the various topics that he discusses.

In addition to the three foregoing contributions, some of the astrophysics chapters include valuable historical perspectives. For instance, Bignall, de Bruyn and Janncey reach back to the 1960s in their discussion of variable extragalactic radio sources; Wielebinski reminds us that the concept of magnetic fields can be traced back more than 3,000 years to the Chinese; Taylor summarizes early Galactic H-line studies; Konevalenko & Stepkin, and Boosh, respectively, provide valuable overviews of early work on recombination lines and Galactic masers; Wilson and Battril discuss the pioneering days of ‘radio astrochemistry’; and in his chapter on “Next generation space VLBI” Hirobayashi takes us back to early terrestrial VLBI experiments, and introduces the Radioastron and VSOP projects.

Radio Astronomy from Karl Jansky to Microjansky is an attractive book and a credit to the editors. It is well laid out and very readable (notwithstanding the technical nature of some of the content). Another notable feature of the volume is the large number of illustrations, many of them in colour. The only obvious limitation I noticed was the absence of an index, yet this is a minor quibble and in no way diminishes the overall value of this volume. It is an excellent reference work for astrophysicists and for historians of radio astronomy who wish to measure their own studies against more recent developments, and at €72 will be an affordable and valuable addition to many libraries.

References
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In Synchrony with the Heavens. Studies in Astronomical Timekeeping and Instrumentation in Medieval Islamic Civilization. Volume 1: The Call of the Minuzin (Studies I-IX), Volume 2: Instruments of Mass Calculation (Studies

The five prayer times in Islam are based on the astronomical position of the Sun in the sky. They are calculated based on the length of the shadow and the start and the end of the twilight during the day. No Western scholar knows more about the history of regulating the time schedules for these prayers, or the determination of the direction of Mecca, than David A. King, the Professor of History of Science at Goethe University in Frankfurt.

His book In Synchrony with the Heavens, which is in two volumes, contains a series of studies that was written by the author over a period of thirty years. Many of the papers in this book have been published before in various journals. However, in several chapters of this work are published here for the first time. They are based on more than five hundred Arabic manuscripts unearthed by the author in libraries around the world that had never been studied before. Dr King’s work is always a delight to read. His knowledge in his field is unequalled today.

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The Cosmic Century is unusual in that it is really two books in one. The first book, while focussing on the development of astrophysics and cosmology in the twentieth century, starts by discussing key nineteenth century developments in photography and spectroscopy. The photographs of thousands of stellar spectra led to a classification scheme that, when connected with stellar colour, directly led to the HR Diagram and subsequently to a basic understanding of stellar physics by the time of the Second World War.

This book divides the historical developments broadly into those that occurred before the Second World War, and those that occurred afterwards. Longair makes clear that while the discoveries made before the War depended on nineteenth century technology, those afterwards often depended on new technologies operating at wavelengths other than in the visible region of the electromagnetic spectrum. Radio astronomy is probably the best example. While Jansky and Reber did pioneering work in the 1930s, it was mostly ignored by the astronomical community, and radio astronomy did not ‘take off’ until the War created both the trained people and equipment that could be used in this new science.

The ‘second book’, so to speak, is the detailed and clear explanation of the technical developments which, by themselves, could almost make an upper-level undergraduate astrophysics textbook. Longair also includes about fifty pages of explanatory notes where derivations or further details are given to concepts discussed in the text. Fifty-six pages are given to references, so if needs be the interested reader can go to the literature for more information.

This book is more than the sum of the two above-mentioned parts: it is an opportunity to learn astrophysics and cosmology from the point-of-view of what astrophysicists and cosmologists were thinking about as the science developed. The writing is always clear, and this book would make an excellent supplement for an upper-level astrophysics course. Even a less-prepared reader would get a lot out of it if they skipped the more mathematical sections.

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Journal of the Antique Telescope Society, #27-428, 2006 [Special Alvan Clark Issue], pp. 44, US$20.00. Copies of this issue of the Journal can be obtained from the Executive Secretary of the Society, Dr Walter Breyer (for details e-mail him at: whbreyer@alttel.net).

The Antique Telescope Society was founded in 1990 to “... unite colleagues interested in antique telescopes, binoculars,
books, and related items; and to promote the membership's interests in astronomical history and discovery, the history of optics, and the preservation and use of these instruments through stewardship and education."

One of the most valued benefits of Society membership is the Journal, and the latest issue deserves special mention. This is a 44-page double number devoted solely to that distinguished American telescope-maker, Alvan Clark.

While Alvan Clark's principal telescopes are well-known and have been brilliantly documented by Warner and Ariail (1995), remarkably little has been written about his early years. In a bid to remedy this, the special 2006 Alvan Clark issue of the Journal of the Antique Society contains an introductory paper (by Journal Editor, Trudy E. Bell), and the following seven contributions:

- Early Clark I: Alvan Clark's Letters to Boston Newspaper Editors, 1847–1851 (by Craig B. Waff)
- Table of Alvan Clark's Known Pre-Factorial Refracting Telescopes (by Craig B. Waff and Robert B. Ariail)
- Early Clark II: Scientific American Coverage of Clark's Pre-Factorial Career, 1849–1860 (by Trudy E. Bell)
- Alvan Clark Bicentennial at Mount Auburn Cemetery (by Richard Koolish and Kenneth J. Launie)
- Early Clark III: The Loomis and Clark Connection, 1850–1855 (by Ian R. Bartky and Robert B. Ariail)
- Early Clark IV: William Leitch's 1861 Visit to Alvan Clark's Workshop (by Robert A. Garfinkle)
- Early Clark V: Maria Mitchell's 1872 Notes on Alvan Clark and Telescope Making (by Trudy E. Bell and Robert B. Ariail)

Between them, these well-illustrated papers provide a wealth of new information about Alvan Clark, and throw new light on the early-Clark era. They are essential reading for anyone interested in the history of telescope-making in the U.S.A.

References

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