

Reviews

Sky and Ocean Joined. The U.S. Naval Observatory 1830–2000, by Steven J. Dick (Cambridge University Press, Cambridge, 2003), xiv + 609 pp., ISBN 0 521 81599 1, hard cover US\$130.00, £90.00, 254 × 180 mm.

The U.S. Naval Observatory is one of the great observatories of the world, with a fascinating history—especially for those with a penchant for positional astronomy or time-keeping—and Steven Dick has done us a real service in producing this much-anticipated book. Nor have we been let down, for this book has been all of fifteen years in the making; no hurried slipshod history, it is a well-researched thorough account of "...the first national observatory of the United States, [and one which is] analogous to the famous observatories at Greenwich and Paris."

Chronologically, the book contains three distinct Parts. The first, titled "The founding era, 1830–65", traces its embryonic beginnings as the Depot of Charts and Instruments in 1830, its evolution to *de facto* observatory status in 1842, and its formal establishment as the U.S. Naval Observatory in 1844. Other chapters in Part I follow its development under Maury's directorship and later (under Gilliss) during the Civil War, while Chapter 3 provides a worthwhile diversion in relating the founding (in 1849) and early years of the Nautical Almanac Office. In his account of the critical 35-year period covered by Part I, Dick brings out the interesting interplay between astronomy, meteorology, hydrology, and navigation, and introduces the military-civilian staffing dichotomy which would rear its ugly head with renewed urgency later in the century.

From a personal perspective, I found Part II, "The golden era, 1866–93", the most captivating section of the book, dealing as it does with solar eclipse and transit of Venus expeditions, and Hall's discovery of Phobos and Deimos. During this era, the USNO "... stood at the pinnacle of the world's astronomical observatories by virtue of its high scientific accomplishment ... [in spite of being] plagued by problems ranging from its bad location at "Foggy Bottom" on the Potomac River to persistent conflict over naval versus civilian control." It was also the era of Simon Newcomb, the doyen of American astronomy, a time when the Observatory's 26-inch Clark refractor ranked—albeit briefly—as the largest telescope of this type in the world, and a period of technological innovation where spectroscopy and photography were brought to the service of astronomy. But the foregoing highlights and high-profile events should not blind us to the fact that routine time-keeping and positional astronomy were the Observatory's "bread-and-butter programs" at this time, as Dick gently reminds us.

With the up-coming 2004 and 2012 transits of Venus increasingly in our thoughts, chapter 7 on "William Harkness and the transits of Venus of 1874 and 1882" has particular poignancy. Astronomers from the USNO played critical roles in both transits, leading observing parties that dispersed to the far reaches of the globe. This followed international controversy about the most appropriate means of

observing these rare events, the Americans opting (primarily) for photography and the fixed horizontal photoheliograph. To illustrate the range of preparations that led to a successful transit observing programme, Dick profiles Hobart, one of two Australian stations chosen by the Americans in 1874 (the other was Campbell Town, also in Tasmania—see Orchiston and Buchanan, 1993). Largely as a result of the notorious 'black drop effect' (see Schaefer, 2001) the international results from 1874 were disappointing, placing in jeopardy the American 1882 transit programme. Eventually a much curtailed international operation was approved, again with reliance on photography, and the fact that a meaningful figure for the solar parallax was derived on this occasion is much to the credit of Harkness and his patience and persistence. But once again funding issues prevented the full results being published, and this whole frustrating ordeal is carefully outlined by Dick, along with the fascinating interplay between Harkness and Newcomb as they each jockeyed for supremacy in the solar parallax stakes. History would decree Harkness the sentimental favourite but Newcomb the winner.

The final section of this book deals with "The twentieth century", and at 255 pages is by far the largest of the three Parts. After a chapter about the move from Foggy Bottom to the present site at Observatory Circle, that ever-simmering issue of civilian versus military control, and administrative developments from WWI on, Dick launches into three lengthy thematic chapters about the Observatory's current tripartite obligations: astronomy (with new instrumentation, staff, research programmes, field stations, and discoveries), time-keeping, and navigation. This weighty volume ends with a final chapter titled, simply, "Summary", a bibliographical essay, five appendices (one of which relates to sources) and a detailed and invaluable index.

Despite its length, *Sky and Ocean Joined* is easy reading. It is well-illustrated and well-referenced, and careful editing and proof-reading have made it remarkably free of 'typos' and other errors. I did, however, notice that the locations of the two Tasmanian transit of Venus sites, Hobart and Campbell Town, have been interchanged in figure 7.9, and that one of Dick's own papers about the 1874 transit of Venus expeditions (see Orchiston, Love and Dick, 2000) somehow managed to slip through the net when the page references were assembled. These minor concerns aside, this tome is an historical *tour-de-force*, and I thoroughly recommend it to everyone interested in US astronomical history, positional astronomy, national observatories, naval history, navigation, time-keeping, or the conflict involving civilian and military control of science.

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References

- Orchiston, W., and Buchanan, A., 1993. Illuminating incidents in Antipodean astronomy: Campbell Town, and the 1874 transit of Venus. *Australian Journal of Astronomy*, 5:11-31.
- Orchiston, W., Love, T., and Dick, S.J. 2000. Refining the astronomical unit: Queenstown and the 1874 transit of Venus. *Journal of Astronomical History and Heritage*, 3:23-44.