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BOOK REVIEW

Chasing the Stars

How the Astronomers of Observatory Hill Transformed Our Understanding of the Universe

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This very interesting work provides a detailed account of the history of Washburn Observatory and of its direct descendant, the Department of Astronomy at the University of Wisconsin–Madison, a research institute founded in 1878.

Beginning with the “old” positional astronomy of the 19th century, the authors describe discoveries in the “new” astrophysics and cosmology of the 20th century, followed by a few chapters that provide insight into contributions to the development of space astronomy and the construction of instruments for space exploration. This book also offers a comprehensive description of the historical background of the key players in the history of Washburn Observatory astronomy, as well as an introduction to the great American observatories of the 19th and 20th centuries.

The book essentially describes the ongoing quest to replace the observer’s imprecise human eye with objective and reliable detectors of linear response. The plot of the book is the story of how knowledge and expertise have been transmitted in-house from generation to generation, all the way ensuring the continuity of instrument and observer and, along the path of technological advancement, the dovetailing of machinery and teams of technically skilled scholars. Take Chapter 17, for example, which gives a great description of how students and astronomers were trained in determining the “personal equation”, *i.e.*, a correction for idiosyncratic individual-specific timing errors that all visual observers inevitably make.

As such, the authors repeatedly explain how science works, how Washburn astronomers were constantly having in-depth discussions about the meaning and accuracy of their data, and were constantly analyzing the often overlooked influence of the explicit – and implicit – assumptions underlying their experiments and theories or models. For example, they explain how and why modern science works by describing a very important lesson that is too often forgotten in our modern age: that being wrong is sometimes just part of advancing science and that good scientists should always be critical of their own theories and experiments. In this regard, the description of the effects of interstellar matter measured by the reddening of starlight using Wisconsin photoelectric photometers may very well serve as a case study: it was Washburn Observatory that proved that interstellar matter was a reality to be taken into account. This discovery, which completely contradicted widely accepted assumptions, profoundly changed the scientific understanding of the nature of the interstellar medium and of the size and shape of our Milky Way and of all galaxies beyond our local stellar system.

Throughout the work, and especially in Chapter 35, the authors offer a unique eye-opener about the important roles women played at Washburn Observatory. From the beginning, there was an active policy towards co-education – the practice of educating women and men at the same institution – and the University of Wisconsin was one of the more progressive in bringing women to campus, a policy that paid off in the long run. The social conventions and norms of the time reserved the cold, dark task of nighttime observing – accompanied by higher pay and recognition – for men. Women more typically were given mostly daytime roles, including advanced mathematical work, which led to the creation of task forces of human “computers” measuring and calculating the relative positions of stars on the photographic plates. A very modern aspect of this book is that all the names of women are given with their full first and last name, without women ever being referred to by their husband’s name alone.

This book is very well written. Each of the 43 chapters comprises a number of high-quality historical portraits, photographs of astronomical sites and of ingenious instruments, and various excellent astronomical images. It is clear that a great deal of research has been done in both archival and published sources. The book concludes with a useful six-page index, followed by four pages of selected bibliography.

The target audience for this book is quite broad and includes lay readers, observational astronomers, and history of astronomy lecturers. It is a great book for anyone interested in the basics of astronomical photometry – that is, both technology enthusiasts and scientists primarily interested in the astrophysical application of photometric techniques.

If we think of the visual observer as the larval stage in the evolution of observational astronomy, and the human-assisted machine as the pupal stage, then the practices and norms of scientific research as described in this book will very well serve as a counterpoint to the adult stage, epitomized by machines that are not guided by human natural intelligence, but are entirely driven by AI. That is, from observation over data reduction and analysis, formulation of hypotheses, peer review and publication. And, why not, book reviews.

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