

References

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2. D. Bonhoeffer, *Letters and Papers from Prison*, enlarged ed., Eberhard Bethge, ed., Macmillan, New York (1972), p. 311.
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Sexism Still an Obstacle for Women Scientists

We read with interest and empathy about the first International Conference on Women in Physics, held in Paris in March (PHYSICS TODAY, May 2002, page 24). Many of the points raised in the article coincided with those expressed by participants at a December 1997 meeting held in Bangkok, Thailand, and sponsored by the World Meteorological Organization, on the participation of women in meteorology and hydrology.¹ Like physics, these professions suffer from a gross underrepresentation of women. A 1996 survey of WMO member nations found that, on average, only 1 in 5 meteorologists and hydrologists in the responding nations was a woman.^{1,2} In the US, the figure was only about 1 in 10.³

Both meetings expressed common themes:

- the similar challenges facing women scientists from different countries
- the need for culturally sensitive solutions to address the underrepresentation of women in science
- the larger proportion of younger women students and professionals compared with older professionals, which may indicate either a "leaky pipeline" or a trend toward greater gender balance
- the difficulty of breaking through the glass ceiling, as shown by the

relatively larger number of women at junior levels than in senior positions, as compared with men

► the cumulative negative effect of numerous minor obstacles in women's career paths

► the need to include men in working toward increasing the participation of women in our profession.

Meeting participants recognized that progress will depend on the attitudes and actions of individuals, national institutions, and international agencies. Therefore, separate but complementary sets of recommendations were directed toward women meteorologists and hydrologists, national meteorological and hydrological services, and the WMO. The recommendations focused on improving career opportunities and the work environment and on increasing the participation of women in the activities of the WMO, including its secretariat in Geneva, Switzerland.

The WMO is currently planning a second Conference on Women in Meteorology for 24–27 March 2003, at which participants will examine what progress, if any, has been made in the past five years. The conference will focus on increasing the participation of women in the organization's activities and on ways to accelerate and track progress on this issue. We look forward to sharing our experiences with the broader physics community.

References

1. WMO reports are available at <http://www.wmo.ch>.
2. D. J. Gaffen, D. B. Franklin, E. W. Friday Jr, E. Gorre-Dale, H. Kootval, K. E. Weston, *Bull. Am. Meteorol. Soc.* **79**, 861 (1998).
3. D. J. Gaffen, E. W. Friday Jr, K. E. Weston, D. B. Franklin, *Bull. Am. Meteorol. Soc.* **78**, 2241 (1997).

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I find it interesting that the article on advanced physics in high schools and the article on women in physics appeared in the same issue. If my experience is any indication, the lack of women in physics is linked to the problems female students encounter in high school.

My high school offered AP calculus. I started high school in the honors math program. But I didn't continue, in part because one of my teachers would have been a man well-known for sleeping with female students. When he was finally arrested for sexual misconduct with a minor, I knew I had made the correct decision. What message does it send to young women when a teacher sleeps with students, the whole school knows, and no one does anything until a student reports it more than a decade later?

Moreover, when I told my high-school guidance counselor that I wanted to take physics, she said I shouldn't, because physics is hard. It angered me at the time, but I was going to be a music major then. The same woman advised my brother, a much worse student than I, to major in engineering in college. Such early experiences with sexism in the sciences are very discouraging to young girls. It is important to rein in sexist teachers in primary and secondary education.

Despite my high-school experiences, I finally discovered that my true calling is physics, and I'm in my fourth year at Colorado State University. I know I've had it much easier than women even a generation before me, but sexism is not gone yet. It is still tacitly accepted in higher education—especially in the sciences—even though equality may receive lip service.

An acquaintance of mine went to her organic chemistry teacher for help and was told, "Sometimes men just get it better than women." I overheard another faculty member making a joke about how he wouldn't help one of his male students unless that student brought in his attractive girlfriend. In light of the many hardships women have had to endure in the past, comments like that just aren't funny.

Discrimination against women still exists—it's just more subtle than it used to be. Attracting more women to physics will require confronting the latent sexism that remains in the field.

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at Editors' Request

Context Adds Value to Ancient Astronomy Records

Having read John Steele's review of our *East Asian Archaeoastronomy* in the December 2001

issue of *PHYSICS TODAY* (page 56), we are compelled to respond to certain misstatements and disparaging remarks.

After characterizing the book as “presumably” aimed more toward astronomers than historians, Steele dispenses with its usefulness to astronomers in a single paragraph, only to criticize the book for not including more extensive translation and contextual discussion that would have rendered it more useful to historians of science. In fact, we state explicitly that “the records have been specially chosen because of their potential to advance modern research in astronomy, astrophysics, and chronology.”

Patently false is Steele’s charge that “selective quotation by the authors, and their failure to provide any information about the various sources from which the records are taken, prevent[s]” guarding against pollution of the data set. In fact, we discuss the original sources and their usefulness at some length, both in the introduction and, more specifically, in the introductory discussion preceding each chapter. Furthermore, for the first time in a work of this kind, we provide appendixes that reproduce every translated record in classical Chinese, with detailed reference to the precise location in the original source.

As for “selective quotation,” Steele’s criticism is wrong on two counts. First, unlike most such compendia, we spell out in precise detail our selection criteria for each category of phenomena. It was not our purpose to verify every record, but the criteria were designed to eliminate clearly spurious or ambiguous observations. Whenever potentially significant variants occur, all are provided. Yet Steele conveys the impression that we simply lumped together observational records indiscriminately, with no effort to sort wheat from chaff. Second, the sources we searched, whose history and reliability are well known, generally provide no more data than we have translated.

Finally, there is the issue of the reliability of the observational records, and here Steele resorts to the timeworn red herring of “fakery” in the Chinese sources. This is a charge repeated in the West since the early days of Sinology, usually by those who have only a superficial familiarity with the sources. On the whole, the Chinese records are remarkably reliable, especially as regards the kinds of reports collected

in *East Asian Archaeoastronomy*. To take just one example, of the 37 solar eclipses recorded in *Zuo’s Commentary* for the period 721–481 BC, 32 are identifiable and verified by modern computation, 3 remain unidentified, and only 2 are considered “impossible.”¹ Given that the 5 misses could reasonably be attributed to other causes besides false reporting, Steele’s claim that “[m]any early eclipse records, for example, do not correspond to real events” is a gross exaggeration. Surviving records from the Han Dynasty (206 BC–AD 220) on are usually even more accurate.

We take for granted that no responsible astronomer or historian would approach these ancient records with the kind of naivete that Steele presumes in counseling “great caution” in using the book. Nevertheless, our own work with these records has reaffirmed Joseph Needham’s conclusion of nearly 50 years ago: “[I]f they [the Chinese records] were not more accurate than would appear from some of their severest critics, it would have been impossible to find known periodicities in them, as has in fact been done, e.g. in the case of the sun-spot cycle.”²

References

1. See, for example, J. Needham, *Science and Civilisation in China*, vol. 3, Cambridge U. Press, Cambridge, England (1959), page 418. As Needham’s discussion shows, study of apparent misses has helped correct mistaken assumptions about the calendar.
2. See ref. 1, page 419.

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STEELE REPLIES: The authors have missed the point of my criticism. In part precisely because the book is aimed toward astronomers, more extensive translations (where possible) and more contextual discussion would have been desirable. In translating only those parts of the original texts that apparently record observations, the authors have omitted astrological and other details that may accompany the record. Sometimes the accompanying information

provides additional clarification of the observational account.

The modern scholar needs to understand the contextual background of a record—whether it comes from a collection of portents or is used to test a calendar system, for example—to be able to use it in modern scientific studies. The dynastic histories are not just a collection for us to pillage for astronomical observations, but complex sources reflecting the compiler’s aims that go far beyond the cataloging of observations.

The authors also seem compelled to defend the verifiable historicity of all early Chinese astronomical records, despite compelling evidence to the contrary. For example, many Han records of solar eclipses do not relate to eclipses that could have been seen in China. They were either predicted in some way or “faked.”

Only a fairly small percentage of those eclipses that could have been seen—and those that might have been predicted—are recorded in the dynastic histories. As Wolfram Eberhard, Hans Bielenstein, and others have shown, there is a clear correlation between reports of a relatively high proportion of observable eclipses and the reign of an unpopular emperor. The only conclusion that can be drawn from this is that the astronomical records in the dynastic histories have been manipulated for nonastronomical (I believe political) reasons.

It is pointless to try to defend the historicity of all early Chinese astronomical records. That is the wrong question to ask. In its historical context, the manipulation of the astronomical record as written in the dynastic histories was perfectly acceptable. We should investigate it to try to understand why it was done, not pass judgment as if the histories were simply an observer’s logbook from which we want to decide whether the observer was good or bad.

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Correction

June 2002, page 41—Uri Haber-Schaim’s name was spelled incorrectly. ■