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"The same sky overarches us all": Edward Charles Pickering and the Bureau des longitudes

Dava Sobel

"The same sky overarches us all," American astronomer Edward Charles Pickering (1846-1919) once observed, and this simple truth inspired him to unite the efforts of the world's astronomers, both amateur and professional. He reached out so frequently to his confreres in other countries that his name appears dozens of times in the *procès-verbaux du Bureau des longitudes*, beginning in 1879 – just two years into Pickering's four-decade tenure as director of the Harvard College Observatory in Cambridge, Massachusetts.



*Figure 1 - Pickering and the Harvard Computers, standing in front of Building C at the Harvard College Observatory, 13 May 1913
(Source : Harvard-Smithsonian Center for Astrophysics – Wikimedia Commons)*

Pickering was only thirty when he took over at Harvard. Fresh from his own training and teaching experience as a physicist, he steered the work of the observatory toward the physics of the stars. Along with his younger brother, William (whose name also pops up, though not nearly as often, in the *procès-verbaux*), Edward Pickering became an early booster of astrophotography. Both brothers seized on the technique's obvious value for mapping the heavens, but in later work each one turned photography to his own purpose. William used the camera most successfully within the solar system: he published a complete study of the Moon's features, and discovered the ninth satellite of Saturn from photographs of the planet. Edward, in contrast, was always looking at the stars. He

saw photography as a means to measure stellar brightness, to track changes over time in variable stars, to discover novae and supernovae, and to capture and classify the various types of stellar spectra.

In all these researches Pickering enjoyed the assistance of a staff made up of almost as many women as men, which was highly unusual at the time. Because he trusted his female employees to work independently, and also credited them in all publications, several rose to prominence as astronomers. Williamina Fleming and Annie Jump Cannon, the two most famous of his proteges, both gained national and international recognition for their achievements – including honorary foreign membership in the Royal Astronomical Society.

Polite and charming in his demeanor, Pickering won financial support for research from two New York heiresses who committed their fortunes to Harvard astronomy at his request. Anna Palmer Draper funded the stellar classification project for some thirty years, named it the Henry Draper Memorial in honor of her late husband, and also remembered it in her will. Catherine Wolfe Bruce paid for the construction of a 24-inch (quite large by 19th century standards) telescope that Pickering designed for Harvard's southern station in Peru. Later Miss Bruce relied on Pickering to help her choose worthy work she might aid at other observatories, anywhere in the world.



Figure 2 - "Pickering's Harem," so-called, for the group of women computers at the Harvard College Observatory, who worked for the astronomer Edward Charles Pickering. The group included Harvard computer and astronomer Henrietta Swan Leavitt (1868–1921), Annie Jump Cannon (1863–1941), Williamina Fleming (1857–1911), and Antonia Maury (1866–1952) (Source : Harvard College Observatory – Wikimedia Commons)

Pickering's first communique with the *Bureau* concerned the challenge of assessing the brightness of the stars, particularly the fainter ones. Existing estimates differed by as much as three or four magnitudes from one stellar catalogue to the next, he complained, rendering the information meaningless. As a remedy, he offered a series of stars near the North Pole that could serve as ideal

comparisons for faint stars anywhere in the northern hemisphere. He outlined the program under way at Harvard for systematically measuring and re-measuring these stars so as to establish their magnitudes as absolutely reliable benchmarks. And he invited astronomers at other observatories to join him – to measure the same stars according to the same photometric protocol, and to submit their data to be pooled with the Harvard results for the greater benefit of all. Personally, Pickering found that photometric work suited his temperament, and he devoted much of his own research time to devising and using various photometers; in May 1903 he recorded in a logbook his one-millionth photometric assessment.

Throughout his career Pickering sent the *Bureau des longitudes* copies of all Harvard’s publications, requesting the French publications in return for the observatory’s library. He also shipped examples of his glass photographic plates, which steadily improved in sensitivity and accumulated so rapidly that by 1893 they required their own separate building for storage. (Some half a million glass plates are still held at Harvard, many of which have already been digitized in an ongoing attempt to preserve, and continue to share, their content.)

The preface to the *Connaissance des Temps* for 1914 noted that most of the stellar magnitudes listed in its pages were drawn from the Harvard photometry. Soon after Pickering received his copy of the 1914 *Connaissance*, in 1912¹, he returned it to Paris with hand-written annotations indicating the Harvard / Henry Draper Memorial spectral type for each star. This information, based on work begun by Mrs. Fleming in the 1880s and completed by Miss Cannon, was officially incorporated into the 1919 edition of the *Connaissance*.

When he was elected a *correspondant* of the *Bureau* in 1913, Pickering was serving as president of the American Astronomical Society, which he had helped to establish. He also played an important leadership role within the International Union for Cooperation in Solar Research, the precursor of today’s International Astronomical Union.

Between 1914 and 1918, while the Great War tore Europe apart, the *procès-verbaux* of the *Bureau des longitudes* paired Pickering’s name with the challenge of sustaining communication among the global network of astronomers. Official responsibility for alerting observatories to new discoveries had shifted from Kiel to Copenhagen, but Harvard also helped spread important news. In September 1917, for example, telegrams from Pickering informed several French observatories that a new comet had been found – by Max Wolf of Heidelberg.

As soon as the hostilities ended Pickering set about writing letters to foreign colleagues, intent on making every effort, he said, “for the advancement of our science, regardless of personal or national considerations.” These attempts, however, ended abruptly with Pickering’s death on 3 February 1919.

The *Bureau’s* regret is recorded in the *procès-verbaux* for the meeting of 12 February, its condolences expressed in March, and Pickering’s name invoked again in the *procès-verbaux* for April, May, and June.

Bibliography:

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¹ The *Connaissance des temps* for 1914 was published in March 1912, 2 years ahead of time, as it was usually the case at that time for this ephemeris.