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(*b*. Hanover, Germany, 16 March 1750; *d*. Hanover, 9 January 1848),

astronomy.

Herschel spent the middle half-century (1772–1822) of her long life as assistant and, until William's marriage in 1788, housekeeper to the brother who had rescued her in 1772 from domestic drudgery in their native Hanover. In 2003 the two (incomplete) autobiographies that she wrote were edited and published, and although the second was composed when she was in her nineties, her command of facts continued to be extraordinary. As a result we now have a better understanding of her first thirty-eight years. In addition, her observing books have been studied in detail and the objects she saw identified.

When William and Caroline arrived in the fall of 1782 in the neighborhood of Windsor Castle, William provided Caroline with a simple refractor and told her to search for objects of interest, such as comets, nebulae, and

double stars. After a year he made her an ingenious reflector to use in place of the refractor, and in the early 1790s, a larger version of the same. From the end of 1783, Caroline's nights were often taken up with acting as amanuensis to William while he was searching for nebulae; but in 1786, when William was away in Germany, Caroline had leisure to observe on her own account and found her first comet. After William married in 1788, she was free of household duties and her brother observed less often, and so she could regularly "sweep" for comets. Between 1788 and 1797, when she made the disastrous and inexplicable decision to leave the cottage next to William's house and move into lodgings (so effectively ending her career as an observer), she found seven more comets. One we know as Encke's, and it returns every 3.3 years. Another returned in 1939 and is expected again in 2092.

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These discoveries brought her fame, but they were to prove less significant than her earliest sweeps with the little refractor. Soon after Caroline first began observing, she came across some of the bright nebulae that the French comet-hunter Charles Messier had listed because they were confusing his searches for comets. Then, on 26 February 1783, she found two nebulae that she and William agreed were unknown to Messier. This was in fact true of only one of the two, but William was left with the conviction that nebulae were present in the heavens in great numbers and could be found even by an inexperienced observer with a telescope that was little more than a toy. The nature of the nebulae—were they all distant star clusters, or were some truly nebulous?—was an unsolved problem in astronomy, and on 4 March William committed himself "to sweep the heaven for Nebulas and Clusters of stars." With Caroline's help, this would lead to his catalogs of 2,507 nebulae and eventually, late in the nineteenth century, to the *New General Catalogue* that astronomers use today. Faced with the need to classify these nebulae, which for a time he believed were all clusters of stars, William took as his criterion the degree of clustering. The implication was that scattered clusters would in time become more condensed as gravity continued to bring the component stars ever closer together: scattered clusters were young, condensed clusters old. In this way William began the transformation of astronomy from the clockwork universe of Isaac Newton and Gottfried Wilhelm Leibniz to the modern view whereby everything, even the universe itself, evolves.

Caroline's contribution to the setting in motion of these momentous developments far outweighed the negligible importance of the nebulae and clusters she herself discovered, fewer than twenty in total. If William later rediscovered one of them in his regular "sweeps," and if it was recognized as one that Caroline had seen earlier, her initials were inserted in the published catalog; if not, it languished in her observing books. Two of her observations, however, defy identification. In the summer of 1783 she twice observed "a rich spot" in neighboring regions of sky, and although she is specific as to the locations, no nebulae are to be found there today. It seems likely that she was observing a comet that is otherwise unknown.

Her own published volume relating to John Flam-steed's great *British Catalogue* of stars is better appreciated today. William and she used the catalog all the time while sweeping, yet occasionally they found that it did not correspond correctly to what was in the sky. The problem was that there was no way of proceeding back, from the stars as listed in the *British Catalogue* (volume 3 of Flamsteed's *Historia coelestis britannica*) to the observations in volume 2 on which the catalog entries were based. Caroline, in a work that was routine but called for endless patience and meticulous accuracy, supplied this need, and in the process found many errors and no fewer than 561 stars that Flam-steed had overlooked when compiling the catalog.

BIBLIOGRAPHY

WORK BY HERSCHEL

Caroline Herschel's Autobiographies. Edited by Michael Hoskin. Cambridge, U.K.: Science History Publications, 2003.

Contains the two incomplete autobiographies that Caroline wrote when she was in her seventies and her nineties, respectively.

OTHER SOURCES

Flamsteed, John. *Historia coelestis britannica*. London, 1725.*British Catalogue* is the third volume of this three-volume work.

Hoskin, Michael. *The Herschel Partnership: As Viewed by Caroline*. Cambridge, U.K.: Science History Publications, 2003. A biography of Caroline that focuses on her relationship with William.

———. "Caroline Herschel as Observer." *Journal for the History of Astronomy* 36 (2005): 373–406. Includes an analysis of the objects she observed.

———. "Caroline Herschel's Catalogue of Nebulae." *Journal for the History of Astronomy* 37 (2006): 251–255.

———. *The Herschels of Hanover*. Cambridge, U.K.: Science History Publications, 2007.

Michael Hoskin