

Caroline Herschel's *Autobiographies* (19th Century)

Abstract

In 1772, at age twenty-two, Caroline Herschel (1750–1848) moved from her native Hanover to England to join her brother William, who had established himself there. Her original plan was to make a career in music. At a certain point, however, she began assisting William, a budding astronomer, with his celestial observations, and she subsequently discovered numerous comets. In this selection from her autobiography (written decades after her 1822 return to Germany), Herschel recounts how she became her brother's assistant. The passage also describes how she was diverted from her own observations to take notes on William's work and how she was injured after falling from a telescope framework. The excerpts republished below have been transcribed faithfully from the cited source, meaning that infelicities have been preserved.

Source

[...] of course I was in his absence from home left solely to confuse myself with my own thoughts, which were anything else but cheerful; for a found I was to be trained for an assistant Astronomer^[1] and by way of encouragement a Telescope adapted for sweeping consisting of a Tube with two glasses such as are commonly used in a finder, I was to sweep for Comets,^[2] and by [II 28] my Journal N^o 1, I see that I began Aug. 22, 1782 to write down and describe all remarkable appearances I saw in my Sweeps (which were horizontal). But it was not till the last two months of the same year before I felt the least encouragement for spending the starlight nights on a grass-plot covered by dew or hoar frost without a human being near enough to be within call; for I knew too little of the real heavens to be able to point out every object for finding it again without losing too much time by consulting the Atlas. But all these troubles were removed when I knew my Brother to be at no great distance making observations with his various Instruments on D[ouble] Stars, planets &c. and could have his assistance immediately when I found a Nebula or Cluster of Stars, of which I intended to give a Catalogue (but at the end of 1783 I had only 14,^[3] when my Sweeping was interrupted by being employed with writing down my Brothers observations with the large 20 feet).

I had besides the comfort to see that my Brother was satisfied with my endeavours in assisting him when he wanted another person either to run to the Clocks, writing down a memorandum, fetching and carr[y]ing instruments, or measuring the ground with poles &c. &c. of which something of the kind every moment would occur. For, the eagerness with which the measurements on the diameter of the G[eorgium] Sidus, and observations of other [II 29] Planets, D. Stars &c. &c. were made was incredible which may be seen by the various papers that were given to the Roysl. Soc. in 1783^[4], which papers were written in the day time or when Cloudy nights interfered, besides this the 12 inch speculum was perfected before the spring, and many hours were spent at the turning bench, as not a night clear enough for observing ever passed but that some improvements were planned for perfecting the mounting and motions of the various instruments then in use, and some trials of new constructed eyepieces to be made which mostly all were to be made by my Brothers own hands. Though wishing to save his time he began to have some work of that kind executed by a watchmaker who had retired from business (and lived on Datched Common) but the work was so bad and the charges so unreasonable that he could not be employed. And it was not until sometime after that in his frequent visits to the meetings of the R[oyal] Society (made in moonlight nights) he had an opportunity of looking about for Mathematical workmen Obticians and Founderies &c. But all

what was done in Town seldom answered expectation, and was reserved to be executed with improvements by Alex, during the few months he spent with us.

The sommer months passed in the utmost activity for getting the large 20 feet^[5] ready against the next winter. The Carpenters and Smiths of Datched were in dayly requisition, and as soon as patterns for tools and mirrors were ready my Brother went to Town to have them cast [II 30] and during the 3 or 4 months Alex could be absent from Bath,^[6] the mirrors and optical parts were nearly completed.

But that the nights after a day of toil were not given to rest may be seen by the observations on Mars of which a paper dated Dr 1,1783 was given to the R.S.^[7] Some trouble also was often thrown away in those nights in attempting to teach me to remeasure double stars with the same micrometers [with which] former measures had been taken, and the small 20 ft was given me for that purpose.^[8]

(That subject was ever uppermost with your Father and I regret to this moment; he was not spared a few years longer to see it so amply taken care of by you and your Friends.^[9])

I was also to ascertain their places by an Transit instrument,^[10] lent for that purpose by Mr Dalrimple^[11] but after many fruitless attempts it was seen that the instrument was as much in fault as my observations perhaps might be.

July 8, 178^[3] I began to use the new Newtonian small Sweeper.^[12] (For a description of this Instrument see note to Neb. N^o 1. V Class at the end of the Cat of first 1000 Neb. & Cl. &c.) But it could hardly be expected to meet with any Comets in that part of the heavens where I swept, for I generally chose my situation by the side of my Brother's instrument that I might be ready to run to the clock or write down memorandums. But in the begining of December I became intirely attached to the writing desk [II 31] and had seldom an opportunity after that time of using my new acquired Instrument.^[13]

My Brother began his series of Sweeps when the Instrument was yet in a very unfinished state, and my feelings were not very comfortable when every moment I was alarmed by a crash or fall; knowing him to be elevated 15 or &c. feet on a temporary cross beam instead of a safe Gallery. The ladders had not even their braces at the bottom and one night in a very high wind he hardly had touched the ground before the whole apparatus came down, some neighbouring men were called up to hel[p] extricating the mirror which was fortunately uninjured; but much work for Carpenters was cut out for next day.

That my fears of danger and accidents were not wholly imaginary I had an unlucky sample of on the night of the 31st of Decr. The evening had been cloudy but about 10. o'Clock a few stars became visible, and in the greatest hurry all was got ready for observing. My Brother at the front of the Telescope directing me to make some alteration in the lateral motion which was done by a machinery in which the point of support of the tube and mirror rested (it is described some where as belonging to the small 20 ft)[,] at each end of the machine or trough was an iron hook such as butchers use for hanging their joints upon, and having to run in the dark on ground covered foot deep with melting snow, I fell on one of these hooks which entered my right leg about 6 inches above the knee, my brothers call make haste I could only [II 32] answer by a pittiful cry I am hooked. He and the workman were instantly with me, but they could not lift me without leaving near 2 oz. of my flesh behind. The workmans Wife was called^[14] but was affraid to do anything, and I was obliged to be my own surgeon by applying aquabaseda and tying a kerchief about it for some days; till Dr Lind hearing of my accident brought me ointment and lint and told me how to use it. But at the end of six weeks I began to have some hears about my poor Limb and had Dr Lind's opinion, who on seeing the wound found it going on well; but said, if a soldier had met with such a hurt he would have been entituled to 6 weeks nursing in a hospital.

NOTES

[1] In a deft phrase Caroline conveys her dissatisfaction at the way William simply decided she should become his assistant in astronomy, without asking or even informing her.

[2] William's instructions were in fact more general. She was to look out for double stars, clusters, nebulae, and comets. *Partnership*, 61.

[3] Here Caroline is far too modest. Only a hundred or so nebulae were previously known, so by finding 14 herself with a telescope that was little more than a toy, she had made a significant contribution to knowledge.

[4] In fact William published only two papers in 1783, but one was a ground-breaking analysis of the direction in which the entire solar system is travelling through space.

[5] The 'large' 20-ft was to have mirrors 18 inches in diameter. More importantly, it was to have a secure chair (later modified to a complete platform with guard rail) so that the observer could work without fear of falling.

[6] Alexander enjoyed overcoming mechanical challenges as much as William, and came to work with him in the summer months of each year, when the Bath musical season had ended. William even attempted to set him up professionally as a telescope maker. *Partnership*, 78.

[7] Read to the Royal Society on 11 March 1784 and published later in the year.

[8] William was anxious to find a use for the 'small' 20-ft, now that he had a bigger and better instrument. But he had wholly unrealistic expectations of his little sister. Perched on the top of a 20-ft ladder in the dark, she could hardly achieve what he asked of her.

[9] When William came to re-examine some of his double stars after a lapse of two decades, he found some where the companions had orbited about each other, indicating that an attractive force (presumably gravity) operated beyond the solar system, as Newton had claimed. But a longer interval would be needed to establish that the orbits were 'Keplerian' ellipses, and precision instruments, rather than William's cosmological artillery, were appropriate for the task. As his first serious research in astronomy, William's son John collaborated in the study of double stars with his friend James South, who possessed two 'equatorials' ideal for the purpose (John Herschel and James South, "Observations of the apparent distances and positions of 380 double and triple stars", *PT*, cxiv (1824), Part 3).

[10] The (timed) moment of passage of a celestial body across the meridian gives an accurate measure of the coordinate of the body equivalent to that of longitude on Earth.

[11] Possibly Alexander Dalrymple (1737-1808), hydrographer to the East India Company from 1779 and the first hydrographer to the Admiralty from 1795.

[12] This excellent instrument was of a little over 2-ft focal length, and she could use it while sitting down. Designed and made for her by William, it remained her favourite even after 1791, when William made her a 5-ft 'sweeper' of similar design. As Caroline was a little over 4ft 9inches tall (*Partnership*, 158), she had to stand on a support in order to use the large sweeper. She took the small sweeper with her to Hanover, and its optics survive to this day in the Historisches Museum there.

[13] When William began in the autumn of 1783 to sweep the heavens in a systematic search for hitherto-unknown nebulae and star clusters, he attempted to do this single-handed. But this required him to wait after each recorded observation, until his eyes had adjusted once more to the dark. By the end of the year he had concluded that the solution lay in partnership with Caroline — he would do the observing while Caroline, seated at a desk at an open window nearby, would copy down his shouted remarks — and from then on, Caroline was only occasionally able to observe on her own account.

[14] A workman was employed to raise and lower the tube of the telescope in oscillatory fashion, so that a

wider band of sky (about 2°) could be examined at a single pass than would otherwise have been possible.

Source: Caroline Herschel, *Caroline Herschel's Autobiographies*, ed. Michael Hoskin. Cambridge, U.K.: Science History Publications Ltd., 2003, pp. 71–77. Copyright © Science History Publications Ltd.

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