

Herschel, Caroline Lucretia

(1750–1848)

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Caroline Lucretia Herschel (1750–1848)

by George Müller, 1847

Herschel, Caroline Lucretia (1750–1848), astronomer, was born at Hanover on 16 March 1750, the eighth child and fourth daughter of Isaac Herschel (1707–1767) and his wife, Anna Ilse Moritzen, of Neustadt. Isaac, a former gardener, was an oboist in the Hanoverian foot guards, and though his formal education was limited he possessed an intellectual curiosity that he successfully communicated to Caroline's brothers. Her illiterate mother, however, had no doubt that a daughter's place was in the home, helping with the housework; she opposed all attempts by Caroline to acquire anything more than the most rudimentary education, and resented even the occasional violin lesson given by her father. Caroline tried to acquire some ability in needlework from a kindly neighbour, but for this they had to meet at dawn, for at 7 a.m. her household chores would begin.

Hanover childhood

Caroline's childhood was overshadowed by the defeat in 1757 of the Hanoverian army by the French in the Seven Years' War and the resulting occupation of Hanover. Her elder brother William [*see* [Herschel, William](#)], though in the same band as their father, was too young to be under oath, and so was free to flee to England. In 1767 Isaac, whose health had been poor for many years, died, leaving Caroline's fate in the hands of her mother and brothers. Eventually she was given grudging permission to attend a dressmaking school, but this lasted only a few weeks, after which she resumed her role of household drudge.

Meanwhile William, who by now was established as organist of a chapel in Bath, devised a scheme to liberate his sister from her Hanoverian servitude. He proposed that she be allowed to join him in Bath, at least for a period, to see whether she could be trained as a singer to assist him in his concerts. At first opinion within the family was favourable, but then her eldest brother, Jacob, began to ridicule the idea. Eventually, in August 1772, William travelled to Hanover and prevailed on their mother to release his sister, smoothing the way by the promise of an annuity to pay for a substitute servant.

Music in Bath

The couple left Hanover later in the month, and after an eventful and sometimes perilous journey reached London. There William took the opportunity to visit the shops of opticians: his thoughts were turning away from music and towards astronomy.

In Bath, Caroline took over the running of the household, no easy task as she was virtually uneducated and had limited English. She found it still more difficult to integrate herself into the fashionable society whose members came to take the waters at Bath. But at least her natural abilities were now given free rein: her brother gave her two singing lessons daily, sometimes three, as well as teaching her English and arithmetic, and she had coaching from a dancing-mistress to give her the stage presence required for oratorios. Before long she was appearing at Bath or Bristol as many as five nights a week, singing leading soprano parts in works such as *Messiah*, *Samson*, and *Judas Maccabaeus*. The transformation wrought by William was dramatic: only a short while before, Caroline had been qualified to work only as a housemaid.

But the brother who had rescued Caroline was now to prove so self-centred as to destroy her new career without so much as noticing. William was becoming obsessed with the ambition to explore what he later termed 'the construction of the heavens', and in order to study distant and faint celestial objects he would need telescopes as big as possible. These, he found, he would have to make for himself. Caroline, he assumed, would do whatever was necessary to help. Thus she found the summer of 1775 'taken up with copying Music and practising, besides attendance on my Brother when polishing [telescopic mirrors], that by way of keeping him alive, I was even obliged to feed him by putting the vitals by bits into his mouth' (Lubbock, 68).

Their lives were transformed by William's discovery in March 1781 of the planet Uranus, which he chanced upon as he was systematically familiarizing himself with all the brighter stars. His scientific friends seized the opportunity to persuade the king to grant him a pension that would enable him to give up music for astronomy, his only duties being to show the heavens to the royal family when requested. William eagerly accepted, taking it for granted that Caroline would give up her career in music and partner him in his new vocation.

The apprentice astronomer

William and Caroline arrived at their new home at Datchet, near Windsor Castle, in August 1782. Caroline was dismayed at the dilapidated condition of the house William had taken and at the high price of the local food. But these were the least of her problems. 'I found', she wrote later,

I was to be trained for an assistant Astronomer; and by way of encouragement a Telescope adapted for sweeping ... was given to me. I was to sweep for comets. ... 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.

Lubbock, 150

By the following summer William had built her a telescope expressly designed for the discovery of comets. 'Its movements', he wrote, 'are so convenient, that the eye remains at rest while the instrument makes a sweep from the horizon to the zenith' (W. Herschel, *PTRS*, 90, 1800, 71). In 1791 this sweeper was superseded by a more powerful instrument, of 9 inches aperture and 5 foot focal length. Two years later the astronomer royal, Nevil Maskelyne, visited the Herschels and left the following description of Caroline at work:

[The sweeper] is a very powerful instrument, & shews objects very well ... The height of the eye-glass is altered but little in sweeping from the horizon to the zenith. This she does and down again in 6 or 8 minutes, & then moves the telescope a little forward in azimuth, & sweeps another portion of the heavens in like manner. She will thus sweep a quarter of the heavens in one night.

RAS, Pigott MSS, letter 60

Caroline was to become famous as the discoverer, or co-discoverer, of no fewer than eight comets, four with the sweeper made in 1783, three with its successor, and the last, found in 1797, with the naked eye. However, her earliest sweeps, in the winter of 1782–3, yielded not comets but comet-like nebulae, to add to the hundred or so already known. Later in 1783 she was to discover the companion to the Andromeda nebula.

Excited by these discoveries, Caroline quickly became reconciled to her new career. William, duly impressed, himself began to sweep for nebulae with a small refractor. But whereas the detection of newly arriving comets was an urgent task calling for small instruments with wide fields of view, the study of the permanent nebulae was best done, slowly and methodically, with the most powerful telescope available. In October 1783 William completed the ideal instrument for the purpose, a reflector of 20 foot focal length and 18 inches aperture, and with a stable mounting; and a few days later he and Caroline began to sweep the visible sky, strip by strip, in the search for nebulae. The instrument was directed to the south, at a particular elevation, and at the eyepiece William watched the sky drift past, waiting for a nebula to come into view. He then shouted out a description to Caroline, who was seated at a desk in a room nearby, next to an open window, 'with Flamsteed's Atlas open before her. As he gives her the word, she writes down the declination and right ascension and the other circumstances of the observation' (Lubbock, 138). Afterwards, Caroline would write up a fair copy and carry out the necessary calculations. Her many other duties included preparing lists of stars for use in the sweeps as position indicators and making fair copies of the resulting papers for publication in *Philosophical Transactions*.

Caroline was an indispensable member of a most remarkable team that, in one of the greatest campaigns known to observational astronomy, swept the whole of the visible sky. In twenty years of unremitting toil, brother and sister increased the number of known nebulae from about a hundred to 2500. In 1787 Caroline too received a royal pension, of £50 a year; revealingly, this was the first money that she felt she could consider her own. Meanwhile she continued to manage their domestic affairs as the mistress of William's household. In 1788 this well-established routine received what was to Caroline a most unwelcome disruption, when at the age of forty-nine William decided to marry the widow of a neighbour. Caroline, who until then had been his inseparable companion in every aspect of his life, now had to move into lodgings; and although she eventually became reconciled to the change and doted on her nephew John, born in 1792, she later destroyed her diary for the period.

Respected astronomer

The standard catalogue of stars was the *British Catalogue* of John Flamsteed, published in 1725. William had found his work increasingly hampered by errors in the catalogue, and in 1796 he persuaded Caroline to assemble a list of these errors, a task that took her twenty months. Her list, with an index to Flamsteed's observations, was published by the Royal Society in 1798.

This, and her cometary discoveries, earned Caroline the profound respect of the professional astronomers of the day; thus she spent a week in August 1799 at Greenwich as guest of the astronomer royal. She was also friendly with various members of the royal family, one of the queen's ladies-in-waiting having been a fellow student of Caroline's in a dressmaking class in Hanover. In 1787 Fanny Burney described 'the celebrated comet-searcher' as 'very little, very gentle, very modest, and very ingenuous; and her manners are those of a person unhackneyed and unawed by the world, yet desirous to meet and return its smiles' (*Memoir and Correspondence*, 125).

Return to Hanover

William was older than Caroline and lacked her physical toughness, and in the second decade of the new century his health began to decline. He died in August 1822, and in her grief Caroline made the impulsive decision to quit England and return to Hanover. It was a mistake, for in the half-century since her departure the town had changed beyond recognition. She thought she had returned home to die, but in fact she had many more years of good health left to her, yet the astronomical research that had motivated her life in England was no longer possible: 'at the heavens there is no getting, for the high roofs of the opposite houses' (*Memoir and Correspondence*, 131).

There was, however, one last contribution to astronomy that Caroline could make. In his declining years William had persuaded his son John to abandon his intended academic career and take over his father's work as a student of the heavens. But revision of the great catalogues of nebulae was made difficult by their organization by class rather than position. To facilitate her nephew's re-examination of the nebulae, Caroline therefore undertook the massive task of rearranging the catalogues into a more suitable form. It was work that called for her immense industry and capacity for taking pains, a chore gladly undertaken because it would enable her nephew to bring still greater glory to her departed brother. For this achievement she was awarded a gold medal of the Astronomical Society. Sir David Brewster termed her catalogue 'an extraordinary monument of the unextinguished ardour of a lady of seventy-five in the cause of abstract science' (*Memoir and Correspondence*, 132).

The sturdy health Caroline had enjoyed throughout life, except for a childhood attack of typhus fever, continued. When John visited her in 1832, before leaving for the Cape of Good Hope to survey the southern skies, he recorded that his 82-year-old aunt

runs about the town with me and skips up her two flights of stairs ... In the morning till eleven or twelve she is dull and weary, but as the day advances she gains life, and is quite 'fresh and funny' at ten or eleven p.m. and sings old rhymes, nay, even dances to the great delight of all who see her.

Lubbock, 372

On his return from Africa he visited his aunt again; but, unable to face the emotion of a final farewell, he slipped away before dawn, leaving her devastated. She lived long enough to hold in her hands John's magnificent volume of *Cape Observations*, which completed the pioneering work that she and William had carried out for the skies visible from England.

Declining years

Caroline was a local celebrity, visited by passing scientists of the calibre of Humboldt and Gauss. For her ninety-sixth birthday Humboldt presented her with the gold medal for science, in the name of the king of Prussia; a year later she entertained the crown prince and princess for two hours, and sang them a song by William.

Caroline Herschel had devoted her life unstintingly to the brother who had rescued her from poverty and servitude in Hanover, and her gratitude had known no bounds. During the sweeps for nebulae, as she spent her nights acting as scribe and running errands for her brother on the platform of the telescope, 'I had ... the comfort to see that my brother was satisfied with my endeavours to assist him' (*Memoir and Correspondence*, 52). In later life she would allow nothing to detract from William's reputation, constantly downplaying her own part in their achievement: 'I did nothing for my brother, but what a well-trained puppy-dog would have done' (Clerke, 140). After her death, a cousin wrote to John: 'She looked upon progress in science as so much detraction from her brother's fame' (*Memoir and Correspondence*, 346). Nevertheless, she was too intelligent to be unaware that she could have carved out her own career if her mother had not blocked her every attempt at education, and if her brother had not sacrificed her musical vocation to his own ambitions in astronomy: 'I have been throughout annoyed and hindered in my endeavours at perfecting myself in any branch of knowledge by which I could hope to gain a creditable livelihood' (*ibid.*, 31). Yet it would be hard to identify a single original thought that passed through her mind. Her greatest assets lay in her inexhaustible industry, loyalty, and dedication; although William was one of the greatest astronomers in history, his achievement would have been wholly impossible without the partnership of his devoted sister.

Caroline Herschel died peacefully in Hanover on 9 January 1848, aged ninety-seven, and was buried in the churchyard of the Gartengemeinde, Hanover, alongside her parents and with a lock of her brother's hair in her coffin.

Sources

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- Ransom HRC, corresp. and papers
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Likenesses

- silhouette, 1772, MHS Oxf.
- M. F. Tielemann, oils, 1829, priv. coll.
- G. Müller, engraving, 1847, AM Oxf. [\[see illus.\]](#)
- J. Brown, stipple (aged ninety-two), NPG
- engraving (after portrait, aged ninety-seven), repro. in Lubbock, ed., *Herschel chronicle*

Wealth at Death

books and minor personal effects: inventory, Herschel, *Memoir*, appx