

The Lockyer Ladies

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Astronomy and society have benefited from the contributions of three ladies who were directly linked to Norman Lockyer. His first wife, Winifred James, assisted him in his work and also made independent contributions by the translation of scientific texts from French into English. One of their daughters, Winifred, and his second wife, Mary, also assisted Lockyer in various ways and contributed to the administration of the Norman Lockyer Observatory at Sidmouth after his death.

This paper¹ is mainly concerned with three ladies who played major rôles in the life of Norman Lockyer. Two of them also made important contributions to the Norman Lockyer Observatory after Lockyer's death. None of them are to be found in the standard histories of astronomy since in their own right they made no important astronomical discoveries. Nevertheless, they did make useful contributions to astronomy and to other aspects of society.

The principal Lockyer biographies^{2,3} give scant information about the lives of the ladies who supported him in his scientific life as well as in his family life. However, the archives of the Norman Lockyer Observatory in Sidmouth, Devon contain letters that supplement the other meagre published sources of information on their lives. The archives are held in the library of the University of Exeter.

An account of Lockyer's early life is given by Frost⁴; and a review of his scientific career is given by Wilkins⁵. Therefore, only the basic facts are given here. Joseph Norman Lockyer was born in Rugby in 1836. He was named after his father, Joseph Hooley Lockyer and his mother Ann, who was the daughter of Edward Norman. Unfortunately, she died in 1845, and so Norman was sent to live with his uncle. He went to school in Kenilworth, where he came to the attention Lord Leigh of Stoneleigh, Warwickshire. Norman's father was interested in chemistry, electricity and astronomy and Norman must have absorbed some of this interest. He was, however, mainly interested in languages, but did not go to university. After spending several months studying in Paris and teaching English in Geneva, he got a job as a temporary clerk in the British War Office in 1857 on the recommendation of Lord Leigh.

Mrs Winifred Lockyer

Lockyer obtained a permanent War Office post in 1858. He then married Winifred (Figure 1), the daughter of William James an engineer living in Leamington. We do not know when she was born, where she was educated or when she first met Lockyer. However, we do know that, like Lockyer, she was proficient in French and probably in Italian. They set up home in Wimbledon and very soon started a family. The first boy died when very young; there were six more sons and two daughters. Only one of the sons, William James Stewart, born in 1868, took an active interest in astronomy.



Figure 1

Mrs Winifred Lockyer
First wife of J. Norman Lockyer

This image is from Reference 3.

The Lockyer Ladies

Lockyer became interested in astronomy through friends in a social club in Wimbledon. He soon obtained a good 6.2-inch refractor, which he used to study the Moon and then Mars, before turning to the use of a spectroscope to study the Sun. As a part-time source of income he became a science journalist, and also the science editor of a magazine called *The Reader*. Later he became the founder-editor of the prestigious journal *Nature*.

We must assume that Lockyer was able to afford help bringing up the family since Winifred was able to assist him in his observing – she confirmed his observation in October 1868 of the red C-line of hydrogen from a “red flame” at the edge of the Sun. This led to the award, jointly with Pierre Jules Cèsar Janssen (1824-1907), of a medal by the French Academy of Science. She also went on the solar eclipse expedition to Sicily in December 1870. Unfortunately, the ship hit a rock, but Winifred wrote a full account of the incident⁶.

Her most important contributions to science and to astronomy in particular were, however, her translations of books from French into English. The first, *The Heavens: An Illustrated Handbook of Popular Astronomy* was published in 1866. It was written by Amedée Guillemin, and edited by Lockyer. It went through at least five editions.

Two years later she was responsible for the translation of the book, *Volcanoes and Earthquakes*. Then in 1870, came *The Marvels of the Heavens* by Camille Flammarion. These were followed by two more books by Guillemin: *The Forces of Nature* in 1872 and *The Applications of Physical Forces* in 1874. Again, Norman Lockyer acted as the scientific editor. Only his name is on the title page of at least one of these volumes!

We are told that she helped to arrange musical evenings when they entertained friends, and that they both enjoyed country walks, but otherwise the two Lockyer biographies tell us only that she died in 1879 after a short illness. The only published reference to her life and death that I have found is in an issue of *Nature*⁷. It reads:

“We regret to have to announce the death of Mrs Norman Lockyer, an occasional contributor to this journal and translator of several works on popular science. Her husband’s scientific work for the last eleven years owes whatever it may possess of merit to her constant interest, encouragement, and assistance. Her untimely death will be a shock to many men of science in many lands to whom she was personally known.”

This was, presumably, written by Norman Lockyer himself. I did not find any further comment about

her in the issues for the following few weeks. I have, as yet, not looked systematically for any of her contributions to *Nature*, but I hope to do so, although it is possible that she was not credited with them at the time.

Lockyer’s daughters

Lockyer was left with two daughters and five sons to bring up, but neither of his biographers gives any indication of the domestic arrangements for looking after them.

The elder daughter, Rosaline Annie, was then 15 years old, but we know very little about her and so I can only repeat a few comments by one of Lockyer’s biographers⁸:

“... [she] seems to have inherited something of her father’s stubbornness.”

“... when she was 23 [she] insisted on marrying a man of whom her father strongly disapproved. ... [he thought] the man was a waster ...”

“... in the nineties she had to go on the stage to make ends meet.”

The younger daughter, Winifred Lucas (Figure 2), born in 1873, was the youngest child; she was only six years old when her mother died. We know very little about her early life. The 1928 biography of Lockyer does not even mention her birth! She went to a boarding school, and friends of Lockyer used to invite him to bring “Winnie” when he went to visit them. Meadows states that she acted as a companion to her father and that:



Figure 2

Winifred Lucas Lockyer

This image is from Reference 24, 2nd edition.

“... she also seems on occasion to have acted as a moderating influence between her father and her brothers.”⁹

In 1892 Winfred visited her brother, James, in Göttingen, Germany where he was studying for a Ph.D. in astronomy. He wrote to his father to say that she came with a crowd of girls, was well and enjoying herself. The girls went on to Dresden. Later we learn that Winnie “made a great hit” when she visited Ottawa for two months in 1901, before going on to Toronto; so clearly her father gave her the opportunity to travel. Winifred must have shared her father’s interests in both languages and science, because in 1896 she translated, from German, for *Nature* a discourse by Professor Cornu on upper atmosphere phenomena¹⁰.

Lockyer’s career, 1873 to 1903

Prior to his wife’s death Lockyer had started solar observations at South Kensington in 1873¹¹, and had transferred from the War Office to the Department of Science and Art in 1875¹². In 1876 he organised an exhibition of scientific apparatus, which became the basis of the collection in the Science Museum. In 1881 he was appointed as a lecturer in the Normal School of Science, and became its first Professor of Astronomical Physics in 1887. He wrote several books, including *The Dawn of Astronomy*, in which he pioneered attempts to find an astronomical significance in ancient stone monuments, such as the pyramids and the temples of Egypt and Greece, and he dated Stonehenge. In 1897 Lockyer was knighted. In 1901 he retired his Professorship, but was formally appointed Director of the Solar Physics Observatory at South Kensington. At that time his son, James, was the Chief Assistant at the Observatory.

Lockyer corresponded with a large number of people of many different interests clearly he was a very sociable man. While cataloguing his letters that still remain, I tried to find out more about the people involved. I was intrigued by two letters from Lady Meux¹³, who invited him lunch, offering him an undefined “amusing temptation”, and two weeks later inviting him to join her in her box at Her Majesty’s Theatre. I was amused to find that her husband was otherwise engaged in the siege of Ladysmith at the time!

In his biography we read that in 1903 “On May 23, Sir Norman married Thomasine Mary, the widow of Bernard E. Brodhurst, F.R.C.S., and the younger daughter of Mr. S. Woolcott Browne”¹⁴. No other information is given about Mary, as she

was known, nor about the circumstances that led to the marriage, nor about the reason why they later retired to Sidmouth.

The Browne sisters

At this point we go back in time to pick up the story of two young girls, Annie and Mary Browne, who used to stay in Sidmouth with their grandparents, Captain and Mrs Carslake. Annie was a very delicate child, but her younger sister, Mary, born in 1852, was more robust and had a passion for riding and outdoor activities. In 1868, when they were still teenagers, they moved with their parents from Bridgwater to London, where they attended Queen’s College in Harley Street. The elder girl, Annie, attended the College for six years until 1874, but there appears to be no record of her courses or results. On the other hand we know that Mary was awarded a scholarship that covered her attendance at classes in astronomy and natural philosophy. She became a mathematics tutor in 1875 and also attended courses at University College on physics and applied mathematics.

Whilst in Egypt in 1882 on a solar eclipse expedition, Lockyer wrote to Mary Browne¹⁵, who was then employed at the Solar Physics Observatory. He told her about the eclipse and, after expressing the hope that she is very happy, he ended his letter “always very sincerely yours”. Mary was 30 years old at the time; Lockyer was 16 years older. We can only guess about Mary’s feelings, but we do know that she kept this letter.

At this time Annie and Mary were actively involved in establishing for women students in the University of London a residence hall, which later became known as College Hall¹⁶. They were also involved in the suffragette movement and in other social work in London. For example, they helped Canon Barnett to establish Toynbee Hall in Whitechapel. Lockyer was also involved with Toynbee Hall. Annie and Mary also kept up their love for Sidmouth. On visits to the town they used to attend the Unitarian Chapel. Annie donated the rent of adjacent May Cottage for five years, and in March 1885 it was opened as a cottage hospital. This developed into the present Sidmouth Hospital.

In the same year, 1885, Mary married one of the men on the committee for College Hall, a surgeon, Bernard Brodhurst, so she became the third Mrs Brodhurst¹⁷, rather than Mrs Lockyer. She had six step-daughters, but I know nothing about her life whilst she was married to Brodhurst, who died in 1900.

The Lockyer Ladies

Lady Lockyer

We know nothing of the circumstances that brought Lockyer and the widowed Mary (Figure 3) together again, and I have not even been able to find out where they were married in 1903. We do, however, have a photograph of Lady Lockyer and Sir Norman in formal dress that might have been taken on their honeymoon. It is held in the Royal Greenwich Observatory Archives in the Cambridge University Library and, by chance, the archivist asked me if I could identify the man!



Figure 3
Lady Lockyer

This image is from Reference 24, 2nd edition.

In the same year as his second marriage, Sir Norman became President of the British Association for the Advancement of Science. Near the end of his term of office, he arranged a dinner for the Prince of Wales at the Athenaeum Club. The correspondence¹⁷ for that event shows that the Club Committee agreed to Lockyer using some of his own silver and flowers, but would not agree to Lady Lockyer arranging the flowers!

In the following year, 1905, Lockyer started the British Science Guild, a pressure group formed to try to persuade the government to put a greater investment in science education and research. Lady Lockyer became the Honorary Assistant Treasurer; I think we can assume that she did the work, but that Lord Avebury, the Honorary Treasurer, took the credit. She also continued to campaign, with Sir Norman's support, for greater recognition of the rôle of women in society. She participated in the suffrage movement and lobbied members of both houses of Parliament.

Lady Lockyer must have retained her interest in astronomy because in 1905 she was a volun-

teer member of the solar eclipse expedition to Majorca. Her experience some 20 years before, when she had worked for a short time at the Solar Physics Observatory, must have stood her in good stead. Afterwards she contributed to the report on the expedition an account of the use of one of the instruments. Lady Lockyer was also a keen photographer. She accompanied Sir Norman on his visits to Stonehenge and other ancient stone monuments in Britain, and took photographs to illustrate his articles in *Nature*, for example.

As he entered his seventies, Sir Norman decided that it was time to think about retirement; he and Lady Lockyer planned to build a new home in Sidmouth on land that Mary had inherited. Later, after Lady Lockyer's death, the house was named Brownlands by the family that bought it, but in this case Brown was spelt without an 'e'.

Lockyer's daughter Winifred continued to live with her father and she was the co-author of his last book²⁰, which was about the scientific references in the poems of Alfred Lord Tennyson, who had been a friend of Lockyer for many years. It was published while the new house was being built at Sidmouth. A dome for Lockyer's personal telescope was erected near the house.

The Hill Observatory at Sidmouth

Although Lockyer had retired his Professorship in the Royal College of Science in 1901, he had continued to direct the Solar Physics Observatory, which became independent of the College. The poor observing site at South Kensington was needed for new buildings, and in 1907 the Solar Physics Committee recommended moving the Observatory to a new site on the North Downs near Caterham, Kent, where the observing conditions would be much better. In 1911, however, a committee of the Board of Education decided that the Observatory should be moved to Cambridge as part of the University²¹. Lockyer continued as Director until the end of March 1913.

In 1912 a family friend, Francis McClean²², suggested to Sir Norman the idea of building an astrophysical observatory on the top of Salcombe Hill, above the new house. Such an observatory would provide a home for his father's telescope and other equipment, whilst also providing jobs for his friend, James Lockyer, and a small staff. The idea was taken up, and an appeal was launched for funds to establish the Hill Observatory. Work on building the observatory started in the same year.

Sir Norman and Lady Lockyer donated the site and other equipment. Lady Lockyer became the Honorary Secretary. Winifred became the Honorary Assistant Treasurer and Librarian. Lady Lockyer's sister, Annie Leigh Brown, became a member of one of the committees, and later she made various donations to the Observatory.

In addition to the telescope given by McClean, and one from South Kensington, it was intended that there should be a dome for Sir Norman's own 30-inch reflector. Unfortunately, construction and observing were halted by the start of World War I. A photograph of the ceremony of cutting the first sod for the dome on 21 April 1914 includes Lady Lockyer, Winifred and Princess Arthur of Connaught, who wielded the spade.

The Hill Observatory Corporation was formally established in 1916. Lady Lockyer became the Assistant Treasurer; Winifred the Assistant Secretary. I have not seen any record of Mary or Winifred using the telescopes, but Winifred certainly took an interest in observing since a letter from her was published in *Nature*²³. In it she records seeing 22 meteors during the evening of 3 January 1918.

Sir Norman and Mary had a few more years together at Sidmouth, but Sir Norman died in August 1920 at the age of 84. Obituary notices and biographical articles may be found in many journals and encyclopaedias.

The Norman Lockyer Observatory

Sir Norman was succeeded as Director by his son, James, who had been his chief assistant at both the South Kensington and Sidmouth observatories. In 1921 the Hill Observatory was renamed the Norman Lockyer Observatory²⁴ (N.L.O.). James was a meteorologist and a photographer, as well as an astronomer. His cloud photographs are in the archives of the Meteorological Office and his 'Season's Greetings' cards show both local and astronomical photographs²⁵. The observational work of the N.L.O. was mainly concerned with stellar spectroscopy. Detailed reports on the activities are given in the annual reports of the N.L.O. Corporation, and of the Director.

Both Lady Lockyer and Winifred continued with their administrative responsibilities. They also contributed financially and in other ways that have gone largely unrecognised. It appears, however, that they were given credit for one job that that they did not do! The 1928 biography of Sir Norman²⁶ was attributed to T. Mary Lockyer and

Winifred L. Lockyer, with the assistance of Professor H. Dingle. But Sir Richard Gregory, who succeeded Lockyer as Editor of *Nature* and in other duties, states in a letter²⁷ that it he who designed the book and that he:

"... got Prof Dingle to do the literary job... [so] ... Lady Lockyer and Miss Lockyer did not write a word in the book."

This certainly explains why the book contains no details of the life of the family.

Lady Lockyer was elected a Fellow of the Royal Astronomical Society in 1923, a few years after the Society first admitted women to Fellowship. She maintained her association with College Hall in London, and in 1931 laid the foundation stone for the new building in Malet Street. She, her sister Annie Leigh Browne, and Winifred involved themselves strongly in Sidmouth affairs, but this is not the place to describe these activities.

Winifred died in 1934 aged 60 years. The 1935 edition of the N.L.O. Handbook was dedicated to her memory. Her brother, James, died suddenly in 1936. Lady Lockyer maintained her active interest in the Observatory and it is said that each week she invited the astronomers and local scientists to tea. In her later years, during World War II, she was advised not to travel to London, but she continued to correspond regularly with McClean and Gregory about Observatory affairs.

Dr H. S. Jones (later Sir Harold Spencer Jones), the Astronomer Royal, was a member of the N.L.O. research committee, and he and his wife became good friends of Lady Lockyer. For example, they spent Christmas with her in Sidmouth in 1939 and Whitsuntide in 1940. She also agreed to store chronometers for the Royal Navy in the basement of Lockyer House, as Sir Harold was concerned that they might be destroyed by an air raid on Exeter, where they were then kept.

Lady Lockyer died²⁸ in 1943 aged 91 years^{29,30}. She bequeathed Lockyer House and land, and the residue of her estate, to the N.L.O.. Although there is a small memorial plaque to Winifred at the Observatory, surprisingly, there is nothing to mark Lady Lockyer's contributions.

Kate Lockyer

One other Lockyer lady should be mentioned to complete the picture. James Lockyer married a widow, Kate Irene Wright, in 1921, when he was 53 years old and she was 32. They had met during the Great War, but once again it appears that Sir Norman did not approve, and so they did not

The Lockyer Ladies

marry until after his death. She appears to have played no significant rôle in the affairs of the N.L.O., but she was paid £100 per year for four years after her husband's death. During an interview in 1971³¹ she said that Lady Lockyer was very kind to her, especially after James's sudden death, but that she did not get on well with the rest of the family. The *Sidmouth Herald* stated in the report on James's funeral that they had adopted a son. She died early in 1972.

Epilogue

After the World War II the University College of the South West of England (which became the University of Exeter) provided financial support for the N.L.O. and effectively took control of the N.L.O. Corporation. Observational work ceased in about 1980 and later the site and the principal telescopes were sold to the East Devon District Council. The auxiliary equipment and furniture was sold by auction or scrapped. The proceeds were used to set up the Sir Norman Lockyer Memorial Trust, which is administered by the Royal Astronomical Society. The Observatory is now operated on behalf of the Council by the N.L.O. Society, which is a registered educational charity. Its activities include amateur radio and meteorology as well as astronomy. In recent years extra facilities, including a planetarium, a modern telescope and dome, and a lecture theatre, have been added (see www.ex.ac.uk/nlo). The archives, as well as much of the original extensive library of the Observatory, are held by the University of Exeter³².

There are still many loose ends to tie up before a full account of the Lockyer ladies can be written; but I hope that this partial story conveys some of the interest that the Lockyer family has given me. I would welcome further information or leads that would help me to fill in more of the detail and, if possible, to find more photographs of these ladies who played such important roles in the life of Sir Norman and the people of Sidmouth.

Notes and References

1. This paper is based on a presentation given by the author at the 2006 Spring Conference of the Society for the History of Astronomy, which had the theme *Women in Astronomy*.
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3. A. J. Meadows. *Science and Controversy*. London: Macmillan & Co. Ltd. 1972. Referred to hereafter as: Meadows. *Science and Controversy*.
4. Mike Frost. J. Norman Lockyer: The Early Years. *The Anti-*

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6. Lockyer and Lockyer. *Life and Work*. Reference 2. Page 28.
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9. As Reference 8.
10. A. Cornu. Physical phenomena in the high regions of the atmosphere. *Nature*. 23 April 1896, 53, 588-592.
11. Lockyer and Lockyer. *Life and Work*. Reference 2. Page 72.
12. Lockyer and Lockyer. *Life and Work*. Reference 2. Pages 88-89.
13. University of Exeter Library (Special Collections). MS 110, Meux. Hereafter this source is referred to as EUL
14. Lockyer and Lockyer. *Life and Work*. Reference 2. Page 185.
15. EUL MS 110, Browne.
16. Alice M. Copping. *The Story of College Hall 1882-1972*. London: Newman Books. 1974.
17. There is a photograph of Mary in her wedding dress in the Sidmouth Museum.
18. EUL MS 110, Tedder.
19. EUL MS 110 ZN. This is a report and a cartoon from The Daily Graphic, dated 31 October 1905, on the first meeting of the British Science Guild.
20. J. N. Lockyer and W. L. Lockyer. Tennyson as a student and poet of Nature. London: Macmillan & Co. 1910.
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22. EUL MS 72 add. 1. Unpublished note by F. K. McClean; probably written after 1948.
23. W.L. Lockyer. The January meteors of 1918. *Nature*. 10 January 1918, 100, 365.
24. W. J. S. Lockyer. *Handbook to the Norman Lockyer Observatory*. London: Norman Lockyer Observatory Corporation. 1st Edition 1921; 2nd Edition 1935.
25. EUL MS 72/3/17.
26. Lockyer and Lockyer. *Life and Work*. Reference 2.
27. EUL MS 110, Gregory to Armstrong, dated 05 November 1945.
28. Notices of death and funeral, etc., of Lady Lockyer appear in the Sidmouth Herald and Directory, dated 11 September 1943. Page 3, column 1; and 18 September 1943. Page 6, columns 1-4, and Page 7 column 1.
29. R. A. Gregory. Lady Lockyer. *Nature*, 9 October 1943. 152, 405-406.
30. H. Spencer Jones. Obituary Notice of Lady Lockyer. *Monthly Notices of the Royal Astronomical Society*. 1944, 104, 91-92. Notice that in this obituary, her name (Thomasine Mary) and the date of the renaming of the Hill Observatory (1921) are given wrongly.
31. EUL MS 72 ZX. This item is the transcript of an interview with Kate Lockyer on 23 August 1971 by R. E. Evans on behalf of A.J. Meadows.
32. G. A. Wilkins. The archives of the Norman Lockyer Observatory. *Journal of Astronomical Data*. 2005, 10 (7), 153-162. Also in: Christiaan Sterken and Hilmar W. Duerbeck (Editors). *Astronomical Heritages: Astronomical Archives and Historic Transits of Venus*. Published by C. Sterken at Vrije Universiteit Brussel.