

many capacities in Worcester and the county. In 1860 he was returned to the Council of Worcester; in 1863 he was elected Sheriff, and in the following year became Mayor. Subsequently he was appointed Alderman. In the year 1871 he qualified as a Magistrate for the city, and in 1875 as a Magistrate for the county. In 1874 he was appointed a Severn Commissioner, and in 1885-86 he was elected to fill the position of High Sheriff of the county, a distinction which was evidence of the regard in which he was universally held.

Mr. Perrins took considerable interest in the advancement of the educational institutions in Worcester. He contributed in the most liberal manner to the Victoria Institute, the Public Library, the North Malvern School, and many charitable and useful institutions. The great fortune which fell to his lot was regarded by him as a possession involving commensurate responsibilities, and he was always a generous friend to any movement which expressed the educational and intelligent aspirations of the time. He was a connoisseur in art, and formed a valuable collection of pictures. He was much interested in literature and science, and was well read on many subjects. To this Society he presented a valuable 6-prism automatic spectroscope.

The death of Mr. Perrins, which took place February 26, 1887, leaves a considerable blank in the public and social life of the county of Worcester.

He was elected a Fellow of this Society 1870, May 13.

RICHARD ANTHONY PROCTOR was born in Cheyne Row, Chelsea, on March 23, 1837. He was the youngest of four children, two sons and two daughters, and was rather a delicate child. His mother seems to have been a clever woman. She kept him at home as long as possible, attending to his education herself. His boyish contemporaries remember him as a great reader, devouring books of a more advanced type than boys usually care for. His father, who was a solicitor with literary tastes, died when his little son was thirteen years old.

During later boyhood, Richard Proctor's health improved, and he was sent first to King's College, London, and then to St. John's College, Cambridge, where he obtained a scholarship. While an undergraduate his health still further improved, and he became decidedly athletic. He was captain of the "Lady Somerset," a Johnian Boating Club, and brought his boat up several places on the river.

During his second year at Cambridge he lost his mother, to whom he was devotedly attached; and shortly afterwards, while travelling with his sister, he fell in love with a young Irish lady, to whom he was privately married while at college. He came out in the Honours list of 1860 as twenty-third wrangler, a degree which greatly disappointed his friends, many of whom had already recognised his remarkable talent. Feeling unable to fulfil his mother's wish, and enter the Church, he commenced

to look about him for a profession. For a little time he hesitated with regard to the law, and ate dinners at the Temple; but ultimately he decided to devote himself to Astronomy. He lived for short periods first in Ayr, then in Edinburgh, then near Dublin, and afterwards in Devonport.

Mr. Proctor's first literary venture was an article on "Double Stars," which he sent in 1865, without introduction of any kind, to the editor of the *Cornhill Magazine*. He was greatly pleased to find it accepted, and he afterwards used to tell how he was on the point of despatching a letter of warm thanks to the editor for two copies of the magazine containing the article which had been sent him, when a letter arrived enclosing a cheque in payment. His first book was on *Saturn and its System*; it was published in 1865, at his own expense, and occupied him four years in preparation. When it was published it was very favourably received by astronomers, who recognised that a new writer of exceptional ability had appeared. Geometrical conceptions were expounded with great clearness, and astronomical and historical details were explained with an ease and enthusiasm which attracted the reader. But, though the book was well received by the reviewers, the public did not buy it, and he found, to his great disappointment, that its publication was a source of loss instead of profit. This came upon him at a time of great monetary anxiety, for he was a considerable shareholder in a New Zealand bank which failed during the commercial panic of 1866, entirely absorbing his capital. His family was increasing in number, and the grave question pressed upon him whether it was not his duty to forsake Astronomy and devote himself to teaching, or seek an official appointment. He preferred the independent position of an author, and had a great idea of the importance of the calling. By one of those strange coincidences which occasionally occur, he had received from Dr. Henry Lawson, the editor of the *Popular Science Review*, only a day or two before the news of the bank failure reached him, a request to write a couple of articles on "The Telescope," and an unfinished letter was lying on his desk at the time that the news arrived declining the task. The next morning he set to work at the first of the required articles, and, "from that day onward for five years," he says in some meagre notes for an autobiography which he has left, "I did not take one day's holiday from the work which I found essential for my family's maintenance."

It frequently seemed to him that he must give up all idea of continuing scientific work. He says: "I would willingly have turned to stone-breaking on the roads, or any other form of hard and honest but unscientific labour if a modest competence in any such direction had been offered me." Editors of magazines and journals are not always versed in scientific matters, and his articles were continually sent back to him. Even Anthony Trollope wrote to him, on receiving an article on "The Gulf

Stream," that it seemed interesting, but he must ask for some evidence to show that the author was competent to deal with a subject of the kind in a scientific way. Fortunately, Mr. Proctor was able to satisfy him, and the article appeared in due course in the *St. Paul's Magazine*. The publishers were equally shy of his proposed books and star atlases. At the beginning of the struggle he offered to Messrs. Longman, with whom he had published his *Saturn*, his *Hand-book of the Stars*, but they would not take it. Then he tried Messrs. Macmillan, but they would not venture. So with the help of a friend 500 copies were printed, which sold and paid expenses. With similar help he brought out his *Constellation Seasons*, drawn by himself in transfer for the stone, and his *Sun Views of the Earth*, produced in the same inexpensive way. Both books paid their expenses and a few pounds over, but no new editions were prepared. At last Messrs. Hardwick engaged him to write a small book called *Half-Hours with the Telescope* for 25*l.* It sold well, and they bought the copyright of him for 25*l.* on each of the first two thousand copies. The book is now in its twentieth edition.

During this period he advertised for pupils in mathematics, and for a time took the position of mathematical teacher with a military coach at Woolwich for young men entering at Woolwich and Sandhurst; but the work was very distasteful to him. Slowly he obtained a footing first with one magazine and then with another. He became a regular contributor of *The Intellectual Observer* (afterwards *The Student*), then of *Chambers' Journal* and the *Popular Science Review*. Book after book was rapidly completed, and was accepted on more or less beneficial terms by publishers.

In 1872 he was elected one of the honorary secretaries of the Royal Astronomical Society, which post he held till November, 1873, when he retired in order to go to America on a lecturing tour. During this period he contributed many important papers to the *Monthly Notices* on "Star Distribution," "The Construction of the Milky Way," "The Distribution of Nebulæ and Star Clusters," and on "The Proper Motions of Stars," etc. These papers, which are illustrated by excellent maps, completely disposed of the artificial theories which had previously been in vogue with respect to the construction of the stellar universe. No doubt some advances had already been made on Sir William Herschel's "flat grindstone" hypothesis with respect to the form of the Milky Way, but Mr. Proctor's papers were the first which graphically showed the results which had been arrived at, and they materially extended the generalisations which may now be said to be universally accepted.

He also communicated to the Society a series of papers on Transits of Venus, in which he examined into the conditions of observation for the Transits of 1874 and 1882 with great thoroughness and at much detail. These papers, like those on

stellar distribution, were very fully illustrated by maps and diagrams.

Amongst other matters with which Mr. Proctor's name will always be associated in the history of Astronomy may be mentioned the accurate determination of the rotation period of the planet Mars. His result, obtained from a careful comparison of drawings dating from 1666 to the present day, is $24^{\text{h}}\ 37^{\text{m}}\ 22^{\text{s}}.735$, with a probable error of $0^{\text{s}}.005$.

Another piece of original research with which Mr. Proctor's name will probably remain associated is connected with the resisting medium in the lower coronal region, which he definitely showed offers a very appreciable resistance to the upward flight of the matter of solar prominences, when compared with the velocity of a projectile thrown upward in free space under the influence of solar gravity. The paper in which this is shown is contained in the *Monthly Notices*, vol. xxxi. p. 184. Mr. Proctor was an adept in all that refers to methods of projection and map-drawing. One of his greatest undertakings was the charting of the 324,000 stars contained in Argelander's great *Catalogue*, showing the relation of stars down to the eleventh magnitude, with the Milky Way and its subsidiary branches. His energy was almost unbounded. He wrote fifty-seven books, a list of the more important of which is given below. He played with great expression on the piano, and found time for musical practice as well as for chess and whist, both of which games he played extremely well. He wrote on "Luck and Chance," on the "Geometry of Cycloids," on "Mental Phenomena," on "Athletics" and many other subjects.

Mr. Proctor married twice, his first wife having died in 1879, leaving six children. He married again in America, on his return from a lecturing tour in the Australian Colonies, a widow with two young children. Some little time after this marriage he settled in America, and was returning to England from Florida when he was taken ill in New York. The doctors, believing him to be ill of yellow fever, ordered him to be removed from the hotel on a windy and rainy night, and he died within twelve hours of his removal on September 12, 1888.

Mr. Proctor's last and most important work, *Old and New Astronomy*, on which he had been occupied for some years, and to which he had given his best energies, was not finished at his death; but he has left a considerable collection of material for the remaining chapters, and the book will be completed by a friend.

It may certainly be said of Mr. Proctor that he has succeeded in interesting a larger public in the science of astronomy than any other man. His books have been read and his lectures have been listened to not only in England and America, but in most of the English Colonies; and the wide interest he has stirred up in astronomical subjects will no doubt have far-reaching results and bear important fruit.

He was elected a Fellow of this Society 1866, June 8.

A. C. R.

The following are some of the more important works published by Mr. Proctor:—*Saturn and its System* (1865), *Hand-book of the Stars* (1866), *The Constellation Seasons* (1867), *Half-Hours with the Telescope* (1868), *Other Worlds than Ours* (1870), *Star Atlas* (1870), *Light Science for Leisure Hours* (1871), *The Sun* (1871), *The Orbs Around Us* (1872), *Essays on Astronomy* (1872), *The Expanse of Heaven* (1873), *The Moon* (1873), *The Borderland of Science* (1873), *The Universe and the Coming Transits* (1874), *The Transit of Venus* (1874), *Our Place among Infinities* (1875), *Myths and Marvels of Astronomy* (1877), *The Universe of Stars* (1878), *Treatise on the Cycloid* (1878), *Flowers of the Sky* (1879), *The Poetry of Astronomy* (1880), *Mysteries of Time and Space* (1883), *The Universe of Suns* (1884), *The Seasons* (1885), *Other Suns than Ours* (1887), *Old and New Astronomy* (1888).

JOHN OBADIAH NEWELL RUTTER, who died at Black Rock, Brighton, July 27, 1888, was born in the Isle of Grain, Kent, April 19, 1799. Mr. Rutter was eminently a self-made man. At a very early age his father left England to try his fortunes in the then new colony of New South Wales, where he died in 1806, leaving his son to the care of his uncles and aunts in England, who trained and educated him in such fashion as the opening years of this century afforded. However, in after years he always spoke with gratitude of the kindness shown to him, especially of the motherly care he received at the hands of his aunt Cecilia, who became the wife of the late Dr. Lee, of Hartwell. Learning appears to have come natural to young Rutter, and even at the age of eight years he loved reading, and as years went on he eagerly devoured everything in the way of books brought within his reach. Apprenticeship to a trade followed as a matter of course to one in his position.

As a young man he took to scientific pursuits. He soon acquired a good knowledge of chemistry, and lectured thereon on several occasions. Before 1835 we find him greatly interested in the manufacture of coal-gas, and in the autumn of that year he removed to Brighton to take charge of the Brighton Gas Light and Coke Company. This proved to be the work of his life. From that date until 1882, a period of forty-seven years, his best thoughts were devoted to the service of that company. His own words, in which he desired to record the work of his life, are:—"During fifty years I was engaged, in addition to my other occupations, in promoting the domestic uses of gas. More than half a million of my publications on that subject have been sold."

In addition to chemistry Mr. Rutter devoted himself closely to electricity, upon which subject he gave popular lectures. In 1850 he patented an electric indicator, or fire and thief alarm, and a working model of its adaptation to a house was exhibited in the 1851 Exhibition. In 1854 he published a work on