

## ARTHUR COWPER RANYARD.

It is with deep regret that we record the death of Mr. A. C. Ranyard, which occurred at his home in London on December 14, 1894.

Arthur Cowper Ranyard was born in 1845. In his early life he was much influenced by De Morgan, from whom he received part of his mathematical training. In 1868 he took his degree at Cambridge, and three years later he was called to the Bar at Lincoln's Inn, where he continued to practice his profession until shortly before his death.

But while busied with his legal duties, he found time for much work in mathematics and astronomy. From the time of his election as a Fellow of the Royal Astronomical Society in his eighteenth year until the beginning of his last illness, he was one of its most active and faithful members. As Honorary Secretary from 1874 to 1880, and as a member of the Council for twenty years, he contributed as few men have done to make the influence of the Society what it is to-day. The London Mathematical Society was established partly through his efforts, and he served it also as an Honorary Secretary.

His contributions to astrophysics have been numerous and valuable. Few of the Memoirs of the Royal Astronomical Society are so frequently consulted as Volume XLI, in which he brought together the observations of total eclipses of the Sun up to 1875. This is an invaluable work to solar physicists.

After Mr. Proctor's death he undertook to complete the unfinished volume of the *Old and New Astronomy* and to edit *Knowledge*. In the former the chapters added by Mr. Ranyard are the most valuable portions of the book. *Knowledge*, too, was much improved under his editorship, and by his plan of publishing photogravure reproductions of the best astronomical photographs, students were for the first time enabled to obtain these valuable records. The broad and generous nature of the man is shown by the way in which he sacrificed personal interests, and devoted himself to the task of carrying to completion the work of another. His association in editing De Morgan's *Newton* is a further example of the same spirit.

His papers dealt with a wide range of subjects. Solar phenomena particularly attracted him, and he brought forward much evidence to show that prominences are projected into a resisting medium, and that a true solar "atmosphere" does not exist. He contended that the gases

surrounding the Sun show no such increase in density near the photosphere as they would if the lower layers supported those above them. In the forms of certain nebulae he detected remarkable analogies with those of solar prominences. The dark areas on long-exposure photographs of the Milky Way and other parts of the sky he considered to be masses of absorbing gas between us and the brighter nebulae. He devoted much study to the question of the structure of the universe; his treatment of this subject may be found in the *Old and New Astronomy*.

As an investigator he did much good work, especially at the solar eclipses of 1870, 1878 and 1882. His very active life left him so little opportunity for research that just before his death he was planning to establish a large observatory, and to devote his entire time to astrophysical investigation. The spectroheliograph which had been used in the recent attempts to photograph the corona at the Observatory on Mount Etna was to be attached to his reflecting telescope for work on the Sun, and a large reflector of novel and ingenious design was to be devoted to stellar spectroscopy. But his death occurred while the details of these plans were under consideration.

In his many-sided life his kindly nature and wide sympathies brought him many warm friends. They will keenly feel his loss.

G. E. H.

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#### THE DESIGN OF ELECTRIC MOTORS FOR CONSTANT SPEED.

In the last April number of *Astronomy and Astro-Physics*, in a paper entitled "Electric Controls and Governors for Astronomical Instruments," the author advocated the replacement, whenever possible in laboratory practice,<sup>1</sup> of the ordinary driving clock of telescopes or chronographs by a properly constructed electric motor. Since this article was written a good deal of criticism has been directed, particularly by astronomers, against the use of motors for such purposes, on the ground that they could not be depended upon to maintain the requisite constancy of speed. These criticisms have been in the main unfair in this, that the performance of the best modern driving clocks has been compared with the performance of simply an ordinary commercial motor, greatly, of course, to the advantage of the former.

<sup>1</sup> By "whenever possible" is meant whenever the introduction of electric or magnetic circuits will not be prejudicial to the performance of other apparatus which has to be used in connection with, or in proximity to, the source of motive power.

PLATE VI



ARTHUR COWPER RANYARD