

Soon after beginning work he had a severe attack of cerebral meningitis, and though everything possible was done by those on the spot at Mount Wilson, especially by Dr. Hale and by Dr. and Mrs. Dunham, and the ablest specialists were called in, he died on 1928 November 22.

Pike's first astrophysical paper in the *M.N.* (1926 November) dealt with the fact observed by Evershed and St. John that at high levels above a sunspot there is an inflow of gases. Pike pointed out that owing to the deficiency of selective radiation pressure above a sunspot, the gases at high levels must descend under gravity, and therefore the surrounding chromosphere must be sucked in. The velocity to be expected is of the order of that of thermal agitation, and this is observed. This simple and satisfactory explanation has been generally accepted. Pike then proceeded (*M.N.*, 1927 November) to extend the theory of the support of the chromosphere by radiation pressure so as to apply to the motions of prominences. In the neighbourhood of a spot-facula combination, an atom will be expelled away from the facula by excess of radiation pressure and "attracted" to the spot by deficiency of radiation pressure. Pike calculated the resulting trajectories of atoms for various configurations of spot and facula, and showed that these reproduced many of the observed forms of the prominences. His last paper (*M.N.*, 1928 June) called attention to a possible manner of testing the radiation theory of prominences. He showed that there should on this theory be a "sorting" effect for different kinds of atoms; his computations established that above a spot a  $Sr^+$  atom should acquire a smaller limiting velocity than a  $Ca^+$  atom, whilst above a facula the reverse should occur. In a paper published in the *Proceedings of the Leeds Philosophical Society* (1928 April), he turned his attention to a different subject, namely, novæ. He established the important result that the observed increase in brightness of a nova cannot be explained by a rise of temperature only, but must be accompanied by a considerable expansion of the star as a whole. For Nova Aquilæ III. he estimated that the surface must have moved radially with a velocity of at least 200 km./sec. In all his work Pike showed both marked originality and clearness of thought and expression. He had the faculty of seeing into matters which others had passed over as mysteries. It is a great loss to astrophysics that he did not live to continue the lines of research he opened.

Pike had an extremely attractive personality, and endeared himself to his Oxford teachers and his Leeds colleagues, and his presence at meetings of the Society was greatly valued. He was warmly welcomed at Mount Wilson, and made many friends there in a short time. He is buried near the great Observatory where his researches so prematurely ended.

He was elected a Fellow of the Society on 1928 February 10.

E. A. M.

W. E. PLUMMER.—The death of William Edward Plummer, Director of the Observatory of the Mersey Docks and Harbour Board at Bidston, Liverpool, which occurred on May 22 last, removes from

our ranks the doyen of professional astronomers, for he began observing in the year 1865, and it is doubtful whether any now living, either amateur or professional, can claim to be earlier. Moreover, he was the connecting link between the old astronomy and the new, for he was the first of the old school to be engaged in the kind of astronomy that depends on measurement of the photographic plate, as will appear later in this account of his work.

William Plummer was born in the neighbourhood of Greenwich on 1849 March 26, and at the age of fifteen entered the Royal Observatory as a supernumerary computer attached to the astronomical department, of whom there were then four or five, and soon qualified himself for occasional observing duty with the Transit-circle. In 1868 he transferred his services to Mr. George Bishop, jun., the owner of a famous observatory established by his father in 1836 at South Villa in the Inner Circle, Regent's Park, that had been removed to Twickenham in 1861. The elder Mr. Bishop, a successful business man with a desire to further the interests of astronomy, built this Observatory with the settled idea that it "should do something," and being too old to work personally, took care to enlist the help of those he knew would be good assistants. W. R. Dawes was followed by J. R. Hind in the year 1844, and after the latter was appointed Superintendent of the Nautical Almanac Office in 1853 he continued to exercise a general superintendence over the observatory, the actual observers being the bearers of such well-known names as Pogson, Vogel, Marth, and Talmage. This arrangement remained after Plummer's appointment in 1868, and Plummer always said that whatever skill in observing he possessed was due to Hind's tuition. There appears to have been a recrudescence of activity in this observatory after his appointment. In the *Monthly Notices*, 1870 April, there is a paper "On the Orbit of the Comet of 1683," by W. E. Plummer, prepared at the suggestion of Hind, and the Report of the observatory communicated to the Society in the year 1872, which is in some degree a summary of work of several previous years, speaks of the chart of stars within three degrees north and south of the ecliptic to the eleventh magnitude that is being made from observations; of comets that had been observed during the previous year; and states that Mr. Bishop intended to combine calculation with observation in the proceedings of his observatory. This indicates the range of Plummer's work during these years. He observed comets and computed orbits, and completed the zodiacal charts. A particularly full Report (*Monthly Notices*, 1874 February) shows with what zeal he must have worked at this time. It mentions that the circumstances of the return of two comets have been computed by Mr. Plummer. One of these comets was Brorsen's of 1846, that was detected, at its fifth return, from Plummer's ephemeris in 1873, the predicted time of perihelion passage being only about half a day later than the true one. Plummer was wont at one time to say that he was the only Englishman, besides Halley, who had predicted the return of a comet. The same Report relates how Hind and Plummer watched the stars in the neighbourhood of Tycho's Nova of 1572 to detect

possible changes, because another maximum of that remarkable object was anticipated about that time, though on somewhat uncertain grounds.

This Report was the record of almost the last work done by Mr. Plummer for Mr. Bishop. In the year 1873, on the application of the Savilian Professor of Astronomy, Convocation granted a sum for the establishment of the Oxford University Observatory, and in making arrangements for his staff, Professor Pritchard selected Plummer as his First Assistant. An account of his work and qualifications was sent to Professor Pritchard on 1874 June 4, and appointment followed. The definite date of his removal to Oxford was 1874 September 2, but his duties actually began two months earlier, during which he was helping the Professor in certain preparatory matters.

To state Plummer's work of the next twenty years it may be sufficient to quote the sub-titles of the four volumes of the astronomical observations made at the University Observatory under the direction of Professor Pritchard, for though he, the Professor, was the architect, his assistants were the builders, and, as he was always anxious to acknowledge, it was to their skill that the success of these researches was due. The first volume comprises various subjects, observations of Saturn's satellites, of double stars, of comets, and the elements of the orbits of three double stars. The second is the *Uranometria Nova Oxoniensis*, and contains wedge photometer determinations of the magnitude of all naked-eye stars from N.P.D.  $0^{\circ}$  to  $100^{\circ}$ —the record of three years' labour. The third and fourth volumes of the Oxford observations are entitled *Researches in the Stellar Parallax by the Aid of Photography*, which, as the taking of the photographs and the measurement of them were actually done by Plummer and his colleague Jenkins, as in the two earlier volumes, justifies the statement made earlier that Plummer was one of the first workers at modern photographic astronomy. An investigation of the motion of the companion of Sirius (*Monthly Notices*, 1881 December) appears to be independent work by him.

The next undertaking of the University Observatory was the allotted share of the Astrographic Chart and Catalogue, for which Plummer did much experimental work and preparation for Pritchard, but did not actually begin. The Central Committee that had this work in hand met in Paris in 1891, and Plummer attended the meeting in place of Pritchard, who was unable to do so through feebleness due to age, and referring to this incident Professor Turner writes in the biography of his predecessor Professor Pritchard: "The mention of Mr. Plummer's name reminds me that far too little has been said of his indefatigable and excellent work as Assistant. Professor Pritchard's great age precluded his taking any share in the active work of the observatory as a younger Director might possibly have done, and the whole of this work was carried on by the assistants. Further, the Professor was often absent for considerable periods owing to ill-health, and the actual initiative then fell in many instances to Mr. Plummer. That he should go to Paris as the representative of Professor Pritchard was a fitting tribute to the position he had made for himself by great

zeal and skill. The Astronomer Royal wrote to Professor Pritchard expressing his great satisfaction at the arrangement, and the Central Committee paid Mr. Plummer the further compliment of putting him on a sub-committee appointed to examine and report upon the photographic specimens contributed by the various observatories." The degree of M.A. was granted him by the University *honoris causa* in 1889.

In 1892 the Directorship of the Liverpool Observatory fell vacant, and Plummer applied for and was appointed to the office, and remained in it until the end of his life. His prescribed duties were the maintenance of a time-service, the rating and issuing of chronometers, and the keeping of a meteorological record, to which was added later the examination and testing of instruments other than chronometers. But having a transit instrument and an 8-inch equatorial at command his astronomical tastes naturally urged him to make use of them, and in the early years of his directorship the equatorial was used for observation of comets as they came into view, of occultations, and other occasional phenomena. The transit instrument was set in order with a view to determining the latitude and longitude of the observatory, and an investigation of the positions of certain circumpolar stars was carried on for some years, but the result did not prove satisfactory. Seismographs were installed at the observatory under the auspices of the Earthquake Committee of the British Association, of which he was for many years a member, and in this subject he took a keen interest. He was Hon. Reader in Astronomy in Liverpool University for many years and gave lectures with practical demonstration at the Observatory, and his efforts in the cause of local scientific education received recognition by the award to him of the Kingsley medal by the Chester Literary and Philosophical Society.

Mr. Plummer retained his vigour till about three years before the time of his death, which was due to a painful spinal complaint. He leaves a family of two sons and a daughter; the elder son, Professor H. C. Plummer, who was also at one period on the staff of the University Observatory, Oxford, was Andrews Professor and Royal Astronomer of Ireland in the years 1912–21, and is now Professor of Mathematics in the Military College of Science, Woolwich. Mr. Plummer's elder brother John Isaac was observer at Colonel Tomline's Observatory at Ipswich (closed in 1890), and afterwards Assistant at the Hong-Kong Observatory.

W. E. Plummer was elected a Fellow of the Society on 1879 May 9, and served on the Council from 1889 to 1894. H. P. H.

GEORGE AUGUSTINE TAYLOR was associated with scientific progress in Australia for over thirty years, and devoted his life to the development of industrial science. He began his career as a cartoonist, and was a contributor to *Punch* (being the first Australian artist to attain this distinction), and for thirty years he was art critic of *The Studio*. He was an enthusiast in colour photography, and in 1924 he came over to England to take coloured photographs of the Exhibition at Wembley. His interests were many and varied, but perhaps the chief work of his