Gravitation, in which he inclined to the view that weight should be attached to St. John's zero shift. In 1923 a symposium on Eclipses and Relativity, held at Los Angeles, came to the conclusion that the expected gravitational shift was confirmed by observation, and in 1927 St. John published measurements of the wave-lengths of 1537 lines at the centre of the Sun and of 133 lines at the limb. The lines at the limb gave a mean red displacement which is $0{\cdot}0015 \pm 0{\cdot}0004$ A greater than the relativity shift. At the centre of the Sun, the gravitational shift is masked by Doppler effects due to motion of the gases in the line of sight. St. John correlated velocity outwards with low excitation potential, and velocity downwards with high excitation potential, the residuals being 0·003 A or 2 km./sec. in some cases.

When Einstein himself visited Pasadena in 1930, St. John had the pleasure of demonstrating the 150 ft. solar tower and 75 ft. spectrograph to the founder of the Relativity theory, and of explaining to him the details of the measurements that had been made at Mount Wilson. St. John's amiable exuberance was more than able to bridge the gap caused by the fact that he had no German, and Einstein very little English.

St. John carried out the Mount Wilson observations of solar rotation from 1923–1933. He was President of Commission 12 (Solar Physics) of the I. A. U. until it was split into two subdivisions in 1932. R. v. d. R. W.

William Grasett Thackeray.

My friend Thackeray is dead. He was my colleague in the Royal Observatory, Greenwich, for nearly forty years, and though I had to suffer much playful badinage he never gave me serious offence, and we never had anything like a quarrel. He was the first of my colleagues, after the Astronomer Royal and the Chief Assistant, that I spoke to on a certain Saturday morning when I joined the Observatory staff in November 1881, for he was deputed to show and explain to me the transit-circle, and recollection of the occasion comes to me. Thackeray had just come back from a holiday—it was his custom to take his long leave late in the year at that time—and I remember that his remarks on the instrument, which were not very deep, were interspersed with little accounts of

shooting exploits in the preceding fortnight and other amenities of a country house visit. I do not remember that I had expected my future colleagues would be of the type of the traditional full-bearded astronomer, but it was certainly a surprise to me to find one of them with a moustache that might in those days have been called military, and with the air and deportment of a young man about town.

Thackeray was born on 1853 September 4 at Hunsdon, Hertfordshire, the eldest son of the Rev. Richard William Thackeray, Rector of that parish, a second cousin of William Makepeace Thackeray. He went to school at Bedford Grammar School and afterwards attended Wren's classes at Kensington, a well-known institution in the early 'seventies of last century whose purpose it was to prepare young men for examinations, largely those organised by the Civil Service Commissioners; and at the beginning of the year 1875 Thackeray, without making any special choice, sat for an examination arranged to fill a vacancy on the staff of the Royal Observatory caused by the resignation of Mr. James Glaisher at the end of 1874. The number of candidates was unusually small, for astronomy seems to have presented little attraction as a career in those days, and, after full consideration of the results of the examination, Thackeray was appointed to the post at Greenwich on February 25, 1875. He appears to have been *persona grata* with Airy and his family, though the Astronomer Royal may have had some misgivings lest his interest in football should militate against his astronomical efforts. In his report for 1875 Airy states that Thackeray was employed on circle observations but scarcely yet charged with a department, and a similar remark as to his work, to which the care of the chronograph was added, appears in the Reports of the five succeeding years, but with more implication of responsibility. During this time he was taking his turn in the rota of observing with the transit-circle and altazimuth with Lynn, Criswick, and Downing, and continued to do so subsequently when the first two were replaced by Lewis and myself. In 1881 he was relieved of the circle-reductions and for a time managed the Library, but returned to his earlier occupation in 1885, continuing his association with the transit-circle, superintending the reduction of the observations for north polar distance, translating

the time records on the chronograph sheets and observing with the instrument until the end of the year 1891, when a re-organisation of staff was brought about by the appointment of Mr. Downing to the position of Superintendent of H.M. Nautical Almanac Office. Thackeray was promoted to a higher grade and was made first-class Assistant on 1892 January 1 and took up the office then known in the observatory as Superintendent of Computers, which made him exempt from all observing duty and required him to superintend the miscellaneous astronomical computations, the latter including the preparation of the annual Greenwich Volumes for press and the formation of the star-catalogues from the observations.

When engaged on the circle reductions in the years 1885–1891 he contributed several useful papers to the *Monthly Notices* of the Royal Astronomical Society on matters arising directly out of his work, the diameters of the Sun and Moon, and the personality of observers past and present in their observations of these made with the transit-circle, being the subject of two of them. Another paper was on the measured diameter of Venus, whilst others discussed the differences shown by Greenwich catalogues compared with those of other observations and possibilities that might result from changes in the adopted refraction formula. A memoir in the R. A. S. collection on the R–D discordance prepared in co-operation with Professor Turner is to be mentioned, which, though it does not provide any conclusion, forms an interesting history of this subject. Thackeray was much impressed by Chandler's work on the variation of latitude and its detection from Pond's observations at Greenwich, which led him to express the opinion that the figures from any set of observations will yield something of value if sufficiently worried; and the following up of this no doubt sound idea, though it involved some chasing of wild geese, led to a determination by him of the Constant of Nutation from the Greenwich observations of Polaris, communicated to the aforesaid Memoirs by the Astronomer Royal in 1894. Other papers need not be specified, but it may be sufficient to say that for nearly thirty years the greater part of the routine Greenwich publications were prepared under his direction, and that there is a considerable list of items cognate to that work in the indexes to the publications of the Royal Astronomical

Society with his name affixed, alone or in conjunction with some other. Special mention may be made of the New Reduction of Groombridge's Catalogue of Circumpolar Stars made about 1903 by Mr. Dyson, the Chief Assistant, and himself, issued in 1905 as a Greenwich publication, but with their names on the title-page. He retired on 1919 September 4, having been allowed to continue his service considerably beyond the usual age limit.

In April 1884 Thackeray married Mrs. Hoare, a lady who had lost her first husband but had no children. She died in February 1902, leaving Thackeray with a daughter and a son, the latter of whom he lost two years later when the boy was at Charterhouse and succumbed to an attack of appendicitis. His daughter, the elder child, married Lieut.-Col. C. D. Crozier of the Royal Artillery, who after his retirement from the Army became Bursar of Radley College in 1928. Thackeray lived with his son-in-law and daughter during the last six years of his life in a house that had been built for them, and amused himself by converting the field surrounding it into a garden, which was a task that gave him much interest and pleasure. His heart was failing during his last two years, but he died almost suddenly on March 31 last, leaving with me and doubtless with others the memory of a generous-minded gentleman, who had shrewd views on life that he expressed with freedom and quaint humour, and in whose character there was not a trace of envy or jealousy.

H. P. Hollis.

PUBLICATIONS.

Earthquakes and Mountains.—In his preface to 'The Earth' in 1924 Dr. Jeffreys told his geological readers that they could skip mathematics, which had to be given as guarantee of good faith, and go on to the next paragraph; the appearance of the second edition only five years later may be taken as evidence that the advice was accepted. His latest book * has much less about cosmogony and no pages of formidable aspect for the non-mathematical, and it ought to be very welcome

* 'Earthquakes and Mountains'. By Harold Jeffreys. [Pp. x+183.] (Methuen & Co., Ltd., 1935.) Price 7*s.* 6*d.* net.