

astronomical pursuits. He was particularly interested in the planets, especially Jupiter, but concerned himself with other departments of astronomy also, making frequent use of a Zöllner star spectroscope which he possessed. He was fortunate enough to obtain a good view of the total eclipse of the Sun of 1927 June at Southport. Hawke was unmarried and lived at the time of his death at his father's house in New Barnet. He died on 1929 July 30, after a serious operation, at the age of 52.

PATRICK HENRY HEPBURN. Of these biographies that appear year by year in the volumes of the Society, some are records of men who have died after years of useful work, and sorrow is tempered by the thought that the number of those years makes the loss inevitable. Others are of those whose connection with our science and Society is but slight, and lack of personal knowledge forbids more than conventional regret. Neither description is applicable to the notice now being written, for its subject was one well known to those who meet in astronomical association, to whom death has come in the prime of life, bringing a loss to the science not inconsiderable.

Hepburn came into the astronomical world about the year 1911, though his personal interest in the science began much earlier, for he observed the heavens with a small telescope in his boyhood, went with the British Astronomical Association expedition to Vadsö in 1896 to observe the Total Solar Eclipse in August of that year, saw the eclipse of 1900 from Spain, and in 1905 August occupied a station independently of any organised expedition at Alcala de Chisvert, 2000 feet above sea-level, overlooking the Mediterranean, from which he had a superb view of the circumstances attending the eclipse, and brought home some good photographs. But the above statement is justified by the facts that he joined the Royal Astronomical Society in 1911 April, and took up office in the British Astronomical Association as Director of the Saturn section in October of the same year, having in the previous January contributed his first paper to the *Journal* of that organisation. This paper was a discussion of the reasons for certain peculiarities of illumination of the moon's disc when in eclipse, and was followed in 1912 March by another in the same publication that was equally characteristic of Hepburn. He always deprecated the idea that he was a mathematician, but he had a good knowledge of the elements and a logical mind, and in this second paper he analysed, or reconstructed from first principles, the apparently complicated and puzzling diagram of a solar eclipse (1912 April 16) given in the *Nautical Almanac*. He enjoyed nothing better than using his mental capacity to elucidate the cause of some astronomical fact. It has been said that Saturn was specially the subject of his investigation, and two illustrations relating to this planet may be mentioned. In drawings made when the Rings are most widely open, Cassini's division is usually shown as being visible beyond the polar limb of the Ball, which, from geometrical considerations, would not happen if the dimensions of the planet were as given by the measures of recent years. This led Hepburn to have measures made of

Saturn and his Rings as shown on a photograph taken by Professor Barnard with the 60-inch reflector at Mount Wilson, a copy of which is in the possession of the Society. The results of these measurements compared with other measures are given in a paper in the *Monthly Notices* of 1914 June, and in the course of this investigation he had the readiness to notice an increase of brightness in the regions where the Ring is superposed on the Ball, which led him to infer that Ring A is transparent. The conclusion was contested, and views on the subject will be found in vol. xxv. of the *B.A.A. Journal*. For the second illustration we pass to the years 1920–1921, when the line of nodes of the ring-plane crossed the orbit of the earth, and that plane passed through the earth three times. In the first of a series of papers (*B.A.A.J.*, 1920 February) Hepburn explained these occurrences in easily understood geometry, and in later items of the series, and in his report of the work of the section, dealt with the possible appearance of the ring-system compared with the actual observations, renewing his consideration of possible transparency of the Ring. It may be mentioned that he contributed the largest share of the observations made by the section during this period, observing generally with a 12½-inch reflector, formerly belonging to Mr. Arthur Cottam, F.R.A.S., which he had set up in his garden at Hampstead, but sometimes using the Greenwich 28-inch refractor which was put at his occasional disposal by the Astronomer Royal. That he would come from North London to Greenwich, observe from midnight until dawn, and then go to town for his daily professional duties, seems to be a striking tribute to his energy. Hepburn was President of the British Astronomical Association for the usual period of two years, from 1920–1922 October. He was a specially capable and painstaking occupant of the Chair, and his two Presidential Addresses, the first a valuable analysis of contemporary knowledge of stellar physics, the second a survey of astronomical work in the past as compared with that of the present day, are brilliant expositions and remarkable examples of his thoroughness in all he undertook and his aptness in choice of subjects.

To complete the record of his eclipse enterprises, it is to be added that on the occasion of the central eclipse of 1912 April 17, which was for the most part annular, he went to Chartres, a short distance to the south-west of Paris, and obtained a photograph of the sun at the central phase, the annulus being broken by black markings. In 1914 he went as volunteer observer with the official expedition from Greenwich to Minsk in Russia, where moderately fine weather prevailed at the time of totality, and gave efficient and wanted help. In 1927, when totality was visible from England, he made his observations and took photographs from an aeroplane, in company with Dr. G. Merton, and as an example of his not infrequent efforts for the general good, it may be added that it was largely due to him that on this occasion the seconds of the Greenwich clock were broadcast at the time of the eclipse.

Writing the last paragraph brings to mind Hepburn's adventurous services in the Great War. Shortly after its outbreak, though past military age, he joined the R.N.A.S. (afterwards the R.A.F.) as a balloonist, and had service in German East Africa, round the British coast,

and at Gibraltar and Malta. On an occasion in England when making some experiments or repairs to a captive balloon at Roehampton, the vessel, caught in a sudden storm, overturned, but righted itself, and Hepburn was carried away into Norfolk. Having barely escaped with his life, he treated the matter with apparent unconcern, which was very characteristic. That in a period of leisure at Gibraltar, having made the acquaintance of the local padre, he began the study of Hebrew with some effect, is a striking example of his versatility.

Patrick Hepburn was descended from a family engaged in the leather and skin trades, and the name survives as part of the title of firms now engaged in the business; but his father, the late James S. Hepburn, was a lawyer, and at the time of his death the subject of this notice was sole principal of Hepburn, Son & Cutcliffe, Solicitors, of Cheapside. He was born on 1873 February 4, went to school at Charterhouse, and Amersham Hall School near Reading, and then entered his father's office. He qualified as a solicitor in 1899 and took the degree of LL.B. at London University, with honours, in 1899. Hepburn had many interests in life. Hereditary association brought him into connection with the Curriers' Company, of which he had been Clerk for several years immediately preceding his death, and Master in 1913. He made a study of the architecture of Saxon and Norman churches, and had a large collection of lantern-slides made by himself, which included a series, believed to be unique, of the churches in the neighbourhood of Caen. The Hampstead Scientific Society owes much to him, for when it acquired, about 1909, an 8-inch reflecting telescope, which was housed in an Observatory on Hampstead Heath for semi-public use, Hepburn took it into his care and faithfully discharged the duties that this involved.

To summarise his personality, it might be said that he was apt and anxious to acquire knowledge; he was strong and athletic, energetic in mind and body, courageous even to recklessness, but withal, modest and unassuming. Valentine Ball (son of Sir Robert), an old friend who at one time shared a home with Hepburn, relates an amusing incident. One summer evening Hepburn, who was an enthusiastic and tireless bicyclist, went for a ride in Hertfordshire with the intention of returning that night. But he did not appear until the next evening, and to Ball's inquiry what had happened, answered, "Oh, I got as far as Ware, and as it was fine, I rode on to York and came back this afternoon by train." He developed of late a passion for walking, and at holiday times, or at such times as his practice allowed, would, accompanied sometimes by one of his sons, make a hasty train journey north and walk among the Cumberland hills. He did this, unaccompanied, last December, and left his hotel at Grasmere about one o'clock on Christmas Day to walk to Borrowdale, though advised of possible danger because of the time and the weather. As the result of some accident, the exact course of which has not been fully traced, he was found drowned in a stream in Langstrath Valley on Thursday, December 26, the date of his death being presumed to be December 25. He was buried in Rosthwaite Churchyard.

Hepburn leaves a widow and three sons. Mrs. Hepburn, formerly Miss Harper, whom he married in 1906, was an Australian lady, who has published some volumes of verse under the name of Anna Wickham.

He was elected a Fellow of the Society on 1911 April 12, served on the Council from 1922 to 1928, and as Treasurer during the year 1927-1928.

H. P. H.

GEORGE INNES was a dispensing and photographic chemist who engaged also in optical work. At the time of his death, which occurred suddenly on 1929 May 3, when he was 72 years of age, he was residing at Edinburgh. He was born at Temple, Midlothian, in 1857, and became a Fellow of the Society on 1907 January 11. He was greatly interested in astronomy, and although unable to take any active part in current astronomical work he spent much of his spare time in study and observation, especially in his earlier days. Innes, whose widow survives him, had no children.

SIR OTTO JAFFÉ, who was best known for his services to the city of Belfast, died on 1929 April 29 in his eighty-third year. He was born at Hamburg on 1846 August 13, and received his education in Belfast (where his father, Mr. David Joseph Jaffé, was engaged in business) and Switzerland. He afterwards entered his father's business, the firm of Jaffé Brothers, which was extensively engaged in the linen and yarn trade, and did much to develop the north of Ireland linen industry by exporting largely to the Continent. His prominent public work began in 1892, when he entered the Belfast Corporation. In 1899 and 1904 he was Lord Mayor and in 1901 High Sheriff of that city, and his business experience and capacity were of much service to the Corporation. He was deeply interested in all progressive and philanthropic movements, particularly in connection with the Jewish congregation. He founded an elementary school largely for Jewish children, and was an active member of the committee whose efforts to have the Public Libraries Act extended to Belfast led to the establishment of the Free Library. Hospital work and the Harbour Commission also benefited greatly from his active interest.

Education and research claimed a great deal of Jaffé's attention, a gift of 30 milligrams of radium to the old Queen's College (now the Queen's University) of Belfast in 1901 being used in part for research in the process of linen manufacture. He was chairman of the Technical Education Committee of the Belfast Corporation, and served on the Board of Technical Instruction, Dublin. The Belfast Natural History and Philosophical Society and Society for the Extension of University Teaching numbered him among their vice-presidents, and he was one of the founders of, and chief contributors to, the fund for the better equipment of Queen's College, Belfast. For several years he was chairman of the Executive Committee of that institution, and in 1905, by a gift of £3000 in addition to a previous donation of £1000, he secured the gift of £20,000 which Sir Donald Currie had offered if an equal sum