

Royal Astronomical Society (1937 June 11). He was a Foreign Member of numerous societies including the Geological Society of London, the Accademia dei Lincei, and the Royal Societies of New Zealand and Sweden. He died on 1960 January 25.

He married Hertha Dernberg in 1919 and is survived by her, a son and a daughter.

In person he was small and vivacious, always helpful to inquirers, and tolerant of critics.

HAROLD JEFFREYS.

FRANCIS JOHN SELLERS

With the death on 1959 October 22 of Francis John Sellers, at the age of 84, British astronomy has lost a veteran solar observer of distinction.

Born in London on 1875 January 7, Frank Sellers (as he was known to his friends) was a most promising pupil at Emanuel School, Wandsworth Common, and after an interim period studied at Finsbury Technical College. As a boy he excelled in making scale models of locomotives, and it became evident that he had a strong bent towards mechanical engineering. On leaving Finsbury Technical College with a first class diploma in this subject, he was apprenticed to a firm constructing gas and oil engines, and henceforward he specialized in this branch of engineering. He became in turn assistant manager, manager and general manager in a firm which he joined later. In 1925 he became joint partner in a new enterprise specializing in petrol and paraffin engines linked with the lighting of country houses. Sellers retired in 1928 and although continuing as a private consultant was able to devote himself to his three great interests (apart from his profession), astronomy, music and painting.

His early interest in music had, indeed, led to the meeting with his future wife, then Miss Kate Runciman (niece of the late Lord Runciman). They were both studying music at Battersea Polytechnic, she playing the viola and he the violin. They had another mutual interest in water colour painting, and their marriage in 1903 was followed by several happy holidays spent painting in the Scottish islands and in Northumberland. Duet and quartet playing with friends continued to be a life-long interest to them both, and on the death of Mrs Sellers a few years after the second world war, the heavy blow was made bearable through his devotion to his music (regular quartet playing and a little composing) and to his astronomical work.

When free from his regular professional duties, Sellers gave unstinted support to the British Astronomical Association: honorary secretary

from 1928 to 1938: director of the section for observing the Sun, 1937 to 1952, and President, 1942 to 1944. In addition he shouldered the burden of the editorship of the Journal during the war years. He frequently contributed papers and notes, several of which (like that on the design of an equatorial stand or on the making of a small spectroscope for prominence observations) showed his originality and mechanical skill. He was awarded the Goodacre medal of the Association in 1945.

In the early 1930's Sellers, already a keen recorder of sunspots, was one of those interested solar observers who came to the Royal Observatory Greenwich to see the Hale spectrohelioscope which the Mount Wilson Observatory had sent to the Royal Observatory. Sellers saw the beautiful little instrument and was captivated by its performance. He was soon at work setting one up for himself in true amateur spirit in the attic of his house at Muswell Hill with its extensive view over London. For the rotating unit of the instrument giving (as in the model at Greenwich) an optical oscillation to the pair of slits, Sellers substituted a mechanically oscillated pair of slits of his own design. Later the optical train of his spectrohelioscope was improved by a Hilger grating ruled for the red and lent to him by the Royal Astronomical Society. With his completed instrument he became absorbed in the observation of solar flares and prominences. Examples of his work are given in the special Memoir of the Solar Section of the B.A.A. published in 1952, which incorporated the spectrohelioscope observations of the other amateur enthusiasts at that time.

But the absorbing hours spent at his spectrohelioscope were all too short. The second world war descended upon the country, and work could no longer be continued at Muswell Hill. During this period, when Sellers and his wife took up temporary residence at Leighton Buzzard, he served the best interests of the B.A.A. with his pen as Editor; it is probably largely by his efforts that the Journal was kept going when membership was rising steeply.

With the death of his wife and the difficulties imposed by advancing years, the solar instrument in his observatory became less possible for him to manage and its use was gradually discontinued.

During these latter years of reduced observational work, the outstanding astronomical event for Sellers was undoubtedly the total solar eclipse of 1954 June 30; which he saw perfectly from a B.O.A.C. aircraft over the North Sea. This was his first flight, at the age of nearly 80, and he enjoyed every minute of the 1700 mile non-stop journey. In a life with such wide interests as astronomy, music and painting, it is, perhaps, not surprising that Frank Sellers was unassuming, thoughtful, kind and helpful

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to young astronomical acquaintances, and beloved by his friends. His final illness lasting six weeks in hospital was patiently borne.

Sellers was elected a Fellow of the Royal Astronomical Society in 1927; he served for a few years on the Council and as Vice-President 1944-46.

H. W. NEWTON.

CHARLES ALEXANDER SHAIN

Charles Alexander Shain, an outstanding member of the radio astronomy group at the Australian C.S.I.R.O. Radiophysics Laboratory in Sydney, died on February 11 at the early age of 38 years. His contribution to radio astronomy lay in the frequency range round 20 Mc/s where he pioneered the study of the two features peculiar to this range of radio astronomy: absorption in ionized interstellar hydrogen (H II regions), and absorption and refraction in the ionosphere. Observations in this frequency range are particularly difficult owing to interference from radio stations and the complicating effects of the ionosphere, but they give unique information of great importance to radio astronomy. Shain's work is basic in this field.

Shain studied physics at the University of Melbourne and graduated with 2nd Class Honours in 1942. He immediately entered the 2nd Australian Imperial Force but was discharged on medical grounds late in 1943. He then joined the staff of the Radiophysics Laboratory, where he remained until his death. During the remaining stages of the War, he worked on radar countermeasures, and from 1945 on various aspects of dekametre wave radio astronomy. He was elected a Fellow of the Royal Astronomical Society in 1955.

His work in radio astronomy began with a study of moon echoes at a frequency of 20 Mc/s. This work, which was an immediate follow-up of the pioneering American and Hungarian experiments, led to the recognition of the dual causes of the fading of moon echoes: libration of the Moon and propagation effects in the ionosphere. Using parts of the same equipment, he then began the observations of the distribution over the sky of relatively low frequency (20 Mc/s) cosmic radio waves which he continued until his death. He first used broadside arrays, the largest of which consisted of 30 half-wave dipoles and had a beamwidth of 17° , and then a "Mills Cross" with arms 3 500 feet long and a resolution of $1^\circ.4$.

In the first phase of these investigations he was able to show conclusively that the brightness distribution over the Milky Way at this frequency was