the brief opportunities of leisure to private reading, and at the age of twenty-three he went to school for a year, afterwards entering Aberdeen University, where he passed in all the subjects for the M.A. degree except Mathematics and Natural Philosophy. He was then admitted a divinity student, and, on the completion of his theological studies, served as assistant in several charges before being ordained Minister of the United Free Church at Auchindoir. After thirty-one years of devoted service there he retired to Bieldside, Aberdeen. His indomitable spirit, which knew no defeat, urged him to resume the study of Mathematics and Natural Philosophy. Success came to him, and he received the degree of M.A. at the age of seventy-three. All his life he was a keen student of astronomy, and at Auchindoir and elsewhere he gave lectures on the subject which were much appreciated. In 1907 he married Jane Ironside, daughter of James Ironside of Lumsden, Aberdeenshire, by whom he is survived. He died at Bieldside on 1930 December 10.

He was elected a Fellow of the Society on 1914 May 8.

ADOLPH FRIEDRICH LINDEMANN was born on 1846 May 13 at Langenberg in the Palatinate. From his earliest boyhood he displayed a keen interest in science. He often said that one of the proudest days of his life was when, at the age of fourteen, he set a star in his home-made equatorial and found it exactly upon the cross-wires. His intention was to become an explorer; to fit himself for this and gain experience he undertook, after reading engineering at Nüremberg, the reduction of Neumayer's Australian observations. He then proceeded to study instrument design in the works of Ertel at Munich, for he held that the ability to use and repair any scientific instrument would be an invaluable asset in his chosen profession. While at Munich he unfortunately suffered a severe attack of typhoid fever. On his recovery he found he could no longer support extremes of climate as before and was obliged to forego his early ambitions.

The electrical industry was at that time coming into being. Lindemann took a position in the firm of Siemens Bros. in Woolwich, which was then mainly concerned with cable-making. Within a year he was placed at the head of this department and was responsible for constructing and laying the first cable connecting Ireland and the United States, the only one from that period still in use.

A year later, after a scientific lecture in Pirmasens, he was half-jokingly challenged to supply the town with water instead of finding fossils. As Pirmasens lies some seven hundred feet above the level of the valley, it required some courage to accept this challenge. Despite the difficulties of pumping water to this height, he carried the work through successfully, financing it in London and acting entirely as his own designer, engineer and architect. The waterworks were a complete success and the town in the course of forty years trebled its number of inhabitants and developed into a considerable industrial centre.

In 1884 Lindemann married and settled at Sidmouth. He bought a small observatory which he erected there, and spent much of his time designing and perfecting accessories. A most ingenious chronograph dates from this period, as also a revolving eyepiece, the first of its kind to be constructed. Each ocular was electrically heated to prevent fogging, and fell automatically into focus. In these years also he spent much of his time in working out the design of a novel form of telescope. In principle it has something in common with the Coudé construction, of which, however, he only heard later, though it avoids most of the difficulties of this type, more especially the loss of field of view. Two plane mirrors at 45° to the polar axis, which can be rotated in declination and right ascension, enable the light from any star to be reflected down the polar axis in which the telescope proper is permanently fixed. Whilst some light is lost in the two reflections, this is set off by the advantage of having a steady telescope in stable conditions and also by the economy of having no dome, moving floor or similar paraphernalia. The tower telescopes at Mount Wilson attain the same result in a similar manner.

A theoretical paper dealt with Halley's comet. Two methods, based upon the effect of light-pressure, were put forward which enabled an estimate of mass to be made. In 1915 a paper was published in which it was shown that it was possible to photograph bright stars in broad daylight. Had the classical equation for scattering been strictly true, one would have been able to photograph stars so close to the Sun that it would have been possible to test by this means Einstein's formula for the deflection of light without waiting for an eclipse. Unfortunately this was not successful.

In 1919 an instrument was described for measuring photo-electrically stellar magnitudes. It consisted in essentials of an airtight box in which the photo-electric cell was mounted rigidly fixed to a new form of electrometer of small capacity, whose sensitivity and zero were independent of position. A mirror which could be swung into place at 45° enabled one to observe the star one was examining and make certain it was in the centre of the field, from which one could exclude other light by means of an iris diaphragm. Various coloured filters could be interposed to ascertain the colour-index, and an electrically controlled shutter allowed the time during which the light fell on the cell, *i.e.* during which the electrometer was charged, to be exactly controlled. The electrometer consisted of a platinised glass cross-fibre, some 30 μ thick, which was suspended in the centre of a silica torsion thread about 3 μ thick, fixed under tension to a silica frame; electricity flowing from the cell to the fibre caused it to move in the field of small quadrants charged to a fixed potential. The cross-fibre was carefully balanced so that the zero of the electrometer, as well as its sensitivity, was independent of the position. The whole apparatus weighed only a few pounds, so that it could be substituted for the eyepiece in any telescope. This instrument shows all the old genius of design and was the forerunner of the Lindemann electrometer now so widely used.

All these pieces of apparatus were made in his own workshop with his own hands. He was never so happy as when he was at his lathe, turning with exquisite precision some delicate part, or at his desk, inventing some ingenious device to circumvent a difficulty. He scarcely ever read a