Jean Bernard Léon Foucault, Foreign Member of the Royal Society, was born in Paris on the 18th of September 1819. He began the study of medicine, but soon gave the preference to physics and the sciences of observation. At the age of twenty he employed himself in improving the processes of photography. For three years he assisted M. Donné in preparing the illustrations of his lectures on microscopic anatomy, and was associated with M. Fizeau in conducting a variety of original researches. They investigated the comparative intensities of the light of the sun, of the voltaic arc between carbon poles, and of lime heated before the oxyhydrogen blowpipe. They read memoirs on the interference of calorific rays, on the interference of two rays of light in the case of a large difference in the lengths of their routes, and on the chromatic polarization of light. In December of 1849 Foucault described an electromagnetic regulator of the electric light. Conjointly with Regnault he was the author of a paper on binocular vision. He contributed besides several memoirs on colour, on voltaic and frictional electricity, and on the employment of the conical pendulum as a time-keeper.

M. Arago had suggested the employment of Wheatstone's revolving mirror, in a manner resembling its use in measuring the propagation of the electric current in a wire, to decide whether the velocity of light within a refractive medium is greater or less than its velocity in air. The former result implies the truth of the emission theory, the latter that of the undulatory theory. The experiment, as devised by M. Arago, was nearly (perhaps quite) impracticable, inasmuch as it depended upon the observation of an image of momentary duration formed in an unknown part of the field of view. By the happy introduction of a concave mirror having its centre in the axis of the revolving mirror, a fixed image was obtained; and the experiment thus rendered possible proved that the velocity of light is greater in air than in water. This experiment was made in 1850, not long after M. Fizeau had approximately determined the velocity of light in air by measuring the time it occupied in travelling from the place of the observer to a station 8633 metres distant, and back again. Foucault also suggested the means of measuring the velocity of propagation of radiant heat.

In February 1851 he communicated to the Academy the results of his observations on the rotation of the plane of oscillation of a freely suspended pendulum in the direction east-south-west, and thus supplied an ocular demonstration of the diurnal motion of the earth. By the construction of the gyroscope, in September 1852, he gave a second demonstration of the same phenomenon. For these discoveries the Copley Medal for the year 1855 was awarded to him. About this time he was appointed Physical Assistant to the Imperial Observatory. In September of the same year he exhibited a new instance of the conversion of work into heat. A copper

disk being made to revolve rapidly in its own plane, on bringing a horse-shoe magnet into such a position that the disk revolved with its rim between the poles of the magnet, the moving force required to maintain the velocity of rotation increased, and the temperature of the disk was raised.

On the 16th of February 1857 he described a reflecting telescope, having a speculum formed of glass coated with chemically reduced silver and afterwards polished, of 10 centims. aperture and 50 centims. focal length, without being aware that a telescope on the same principle and nearly of the same dimensions had been described by Steinheil in the Allgemeine Zeitung of the 24th of March 1856. In the following year Foucault succeeded in giving the speculum the form of a spheroid or of a paraboloid of revolution, and described a new process for finding out the configuration of optical surfaces. A reflector of this description, having an aperture of 40 centims. and 2·5 metres focal length, was mounted in the Imperial Observatory of Paris in June 1859. Another of these reflectors, having an aperture of 78 centims. and a focal length of 4·5 metres, was constructed for the Observatory in 1862. The polarizer known as his was invented in 1857.

The project of determining the absolute velocity of light in air with the aid of Wheatstone's revolving mirror, conceived in 1850, was carried out in 1862. The value Foucault obtained for it was 298,000 kilometres in a second of time, instead of 308,000 kilometres, the previously received value. Combining the newly found velocity with the constant of aberration, 20·445, the sun's equatorial parallax is found to be 8″·86, the value deduced by Mr. Stone in his recent discussion of the transit of Venus in 1769 being 8″·91, and the value adopted in the 'Nautical Almanac' for 1870 being 8″·95. In this year Foucault was elected a Member of the Bureau des Longitudes.

In the years 1863, 1864, 1865 he appears to have been occupied with the task of investigating the conditions of isochronism of Watt's governor, and modifying its construction so as to render the time of revolution invariable. These improved governors are applied to the transit-recorders constructed for the use of the Indian Survey. In January 1865 he was elected a Member of the Mechanical Section of the Institute. In 1866 he invented a new and improved regulator for the electric light, and a telescope for viewing the sun, in which the light is rendered endurable to the eye by coating the outer surface of the object-glass with a film of chemically reduced silver so thin as to be transparent. This process was applied with complete success to a refractor having an aperture of 25 centims.

In July 1867 he was attacked by paralysis, and died on the 11th of February, 1868. The date of his election as Foreign Member of the Royal Society is June 9, 1864.