developed between Mr. McLaren and Sir William Harcourt, and ultimately the difficulty was solved by his promotion to the Scottish bench. He was thoroughly successful in his new capacity. He made a capital Judge, accurate, precise, fair-minded, and patient, and his death is a loss to the bench.

Lord McLaren's scientific interests were constant throughout his life, and active when promotion to the bench gave him leisure. He served as Vice-President of the Royal Society of Edinburgh for many years, and as a member of its Council continuously from 1883 to 1909, where his advice in matters of business and his skill in drafting documents were of high service. He also contributed several papers to its *Proceedings* and *Transactions* which show considerable mathematical skill. Among these may be mentioned *Tables of Differential Refraction*, and one on *Aplanatic Lenses*. He was a keen astronomer, and acquired, among other telescopes, the 4-inch heliometer with which Sir David Gill made his observations of Mars at Ascension. With Lord Crawford, Professor Copeland, Professor Tait, and an official of the Exchequer, he had charge of the arrangements for establishing the Royal Observatory at Blackford Hill. He continued to take a lively interest in its working, and lent his heliometer to Dr. J. Halm for observations of the solar rotation by the method of displacement of the spectral lines. He was also a Director of Ben Nevis Observatory. His own university conferred the degree of LL.D. upon him in 1882, and Glasgow the same degree in the following year. He leaves a widow and three children.

He was elected a Fellow of the Society 1884 December 12.

R. A. S.

Sir CHARLES TODD was born at Islington, England, on 1826 July 7, and was educated at Greenwich.

On 1841 December 6 he entered the service of the Royal Observatory at Greenwich as Astronomical Computer.

In 1847 he was appointed Assistant Astronomer at the Cambridge Observatory, under the Rev. James Challis. While at Cambridge he made a galvanic determination of the difference of longitude between Greenwich and Cambridge. He was also in charge of the Northumberland telescope, and was justly proud of the fact that with it he was the first in England to take a daguerreotype photograph of the Moon. He was also, in 1846, one of the earliest observers of the newly discovered planet Neptune.

But the Astronomer-Royal (Airy), recognising his exceptional abilities, was anxious to have him back; in 1854 he was offered an appointment as Assistant at Greenwich, and placed in charge of the new galvanic department. When in charge of that department he was responsible for the transmission of time signals throughout England and the dropping of the time-balls.

In 1855 he had occasion to visit Deal, some trouble having occurred in the dropping of the time-ball, and on his way back to headquarters he received a letter from Mr. Airy offering him, on

behalf of the Colonial Office, the position of Superintendent of Telegraphs and Government Astronomer in South Australia. This offer he accepted, and before leaving England he married Miss Alice Gillam Bell, of Cambridge. On his wedding-day he said that he was going out to Australia with the hope of being instrumental in bringing England and Australia into telegraphic communication.

His earliest achievements in his new home were to connect the Australian capitals, Adelaide, Melbourne, and Sydney, by telegraph. On the completion of the direct line from Adelaide to Sydney in 1868 he utilised it for determining the 141st meridian, thus fixing the eastern boundary of South Australia. Longitude signals were exchanged with Ellery of Melbourne and Smalley of Sydney Observatory, the results showing that the boundary between South Australia and Victoria as formerly determined was two and a quarter miles too far westward. Thus arose the "Disputed Boundary" case, which is at the present time before the High Court of Australia for settlement. The determination of Australian longitudes made in 1883 at the instance of the Royal Society and Royal Astronomical Society in connection with the transit of Venus observations of 1882 December, confirmed the 1868 boundary determination.

But the work with which the name of Sir Charles Todd will always be most closely associated was the construction of the transcontinental telegraph line between Adelaide and Port Darwin, which constituted the last great link in the telegraphic chain connecting Australia with the old world. Two thousand miles of unknown country had to be spanned, and all the poles and other material had to be conveyed by waggons or camels. The successful journey of the explorers M'Kinlay and Stuart across the continent had paved the way for this enterprise. The other colonies were invited to share in it, but declined, and South Australia went ahead with the work alone. It was commenced in 1870 and completed in 1872. On August 22 of that year, at Central Mount Stuart, in the very centre of the Australian continent, Sir Charles had the satisfaction of completing the line of communication between Adelaide and Port Darwin, and of receiving on his little pocket relay messages of congratulation from the Governor and citizens at Adelaide. The cable between Port Darwin and Java, however, was broken down, and it was not restored till October 21, when communication was established with England. On November 15 banquets were held in Adelaide, Sydney, and London to celebrate the event.

His next work was to construct the line connecting South Australia with West Australia, and shortly afterwards he received the honour of knighthood in the order of St. Michael and St. George.

In addition to his labours as Postmaster-General and Superintendent of Telegraphs, Sir Charles Todd faithfully and successfully attended to the duties of his office as Government Astronomer.

The Observatory was furnished with a fine equipment of astronomical and meteorological instruments, including an 8-inch Cooke equatorial (brought out in time for the transit of Venus observations in 1874), an excellent 6-inch transit-circle by Troughton & Simms, photographic barograph and thermograph, etc.

In 1882 December he journeyed to Wentworth, and obtained good observations of the transit of Venus at that station.

In 1895 he was consulted by the West Australian Government in regard to the establishment of their new Observatory. Sir Charles selected a commanding and beautiful site on the top of Mount Eliza, on the outskirts of Perth, and advised as to the buildings and the procuring of the best modern instruments. His chief assistant, Mr. W. E. Cooke, was chosen to be the new Government Astronomer at Perth.

Sir Charles took a special interest in meteorology, and trained and organised his large army of postal officials to become meteorological observers, all the important post and telegraph stations in the State being equipped with rain-gauges or other meteorological instruments. The publications of the Adelaide Observatory thus contain a very complete record of the climatic and meteorological conditions of the State.

He also was keenly interested in every effort for the progress of science, and was the author of numerous scientific papers. He was President of the Astronomical Society of the State from its inception till his death, and was prominently connected with many other scientific bodies and public institutions. He was honoured in England by being elected a Fellow of the Royal Society, and in 1886, when revisiting England, received the honorary M.A. degree from the University of Cambridge. Two foreign scientific bodies also conferred distinctions upon him. Although his greatest success was achieved as Postmaster-General, he was at heart really an astronomer, and throughout his long life was filled with the keenest interest and enthusiasm for the science. This explains how it was that, in addition to his arduous labours in the Post Office, he was able to successfully organise and attend to the work of an observatory.

He retired in 1906 December, after spending half a century in the service of the colony, and sixty-five years in the service of the empire. A very real compliment was paid to him by the State Parliament, which refused to pass an act for the compulsory retirement of septuagenarians so long as he remained in the South Australian public service.

He died on 1910 January 29 in his eighty-fourth year, honoured and beloved by all, and left one son, Dr. C. E. Todd, and four daughters, Lady Todd and his eldest son Mr. Hedley Todd having predeceased him.

Sir Charles Todd was the author of numerous papers in the *Monthly Notices* dealing with his observations at Adelaide, especially with the phenomena of Jupiter's satellites and observations of comets.

He was elected a Fellow of the Society 1864 April 8.

[The Council are indebted for the above notice to Mr. G. F. Dodwell, Government Astronomer, South Australia.]

FREDERICK WILLIAM WATKIN, youngest son of the late Reverend John Woodlands Watkin, D.D., vicar of Stixwold, Lincolnshire, was born there, 1859 March 20. He was educated at Manchester Grammar School and Corpus Christi College, Oxford, where he won the junior mathematical scholarship. In 1883 he was appointed a master at St. Paul's School, and took charge of the recently created Science Side, which, during his twenty-six years of service to the school, grew to rival the Classical Side in numbers and success. For many years he was a house-master, and shortly before his death he was appointed Surmaster of the school.

Mr. Watkin married in 1898 Mary Elizabeth Simpson, eldest daughter of the late Robert Henry Simpson. He died 1910 April 6, leaving a widow and four children.

He was elected a Fellow 1884 February 8.

With the death of JOHANN GOTTFRIED GALLE the curtain finally descends upon the great drama of the discovery of Neptune, the opening scenes of which thrilled the whole world two-thirds of a century ago. The end is calm after storm. The exit of the last actor stirs no memories of conflict save by association, for Galle took no part in the scenes where the battle raged. His own honourable share in the discovery was never seriously questioned; he made no claims likely to be disputed, but, on the other hand, excited admiration by the modesty with which he ceded all glory to Le Verrier. In a long and tranquil life devoted to astronomical work he won ample recognition for himself independently of his share in the great discovery; and now, twenty years after all the other actors have left the stage, Galle, full of years and honours, makes his farewell to a generation which first heard his name and fame from their grandfathers.

Galle was elected one of our Associates on 1848 May 12, several years before the oldest existing Fellow was elected, and for some time past he has therefore been the "Father of the Society." The interval of eighteen months between his observation of Neptune (1846 September 23) and his election as Associate would probably have been even shorter but for the circumstance that the election of Associates was formerly left to individual initiative, which apparently did not "secure a proper attention to the names of rising astronomers" (*Mon. Not.*, viii. p. 79). The Council accordingly took the matter into their own hands in February 1848, and the result was the election of twenty-one associates in a body on May 12. The second name in the list is that of Dr. C. Bremiker, whose map of Hora xxi. was used by Galle in finding Neptune. Three of the twenty-one, Faye, Galle, and O. Struve, survived their election by more than half a century, the death of Faye in 1902 closing the long partnership.