12½-inch reflector and a 4½-inch refractor, mounted equatorially.

Mr. Waugh was elected a Fellow of the Society in 1888, and died the 25th of November 1905.

Sir William James Lloyd Wharton was born in London in 1843, the son of Mr. R. Wharton, County Court Judge of York, and entered the Navy at the age of 14. In 1865 he became lieutenant, and in 1872 commander, being appointed to surveying service in the Mediterranean and the East African coast; an investigation of currents in the Bosphorus which followed brought him to notice as a scientific officer, and his authorship of the standard work on *Hydrographical Surveying* led to his appointment in 1884 to the office of Hydrographer to the Admiralty, which he held until failing health compelled his retirement in 1904. He was elected a Fellow of the Royal Astronomical Society in 1877, and of the Royal Society in 1886, and served for many years as one of the representatives of the Royal Society on the Joint Permanent Eclipse Committee. In 1895 he was promoted to the rank of rear-admiral (retired), and in 1897 received the honour of a K.C.B.

Sir William Wharton's interest in astronomy was manifested by the persistent exercise of his influence with the Board of Admiralty towards obtaining from time to time accession to the means and appliances of the Royal Observatories at Greenwich and the Cape of Good Hope.

He observed successfully the transit of *Venus* in 1874 at Rodriguez, and again in 1882 in the Straits of Magellan; whilst the skill with which he observed with sextant and artificial horizon renders the numerous astronomical positions determined by him in many parts of the world unchallengeable for their accuracy.

He died at the Cape Observatory while staying there as the guest of Sir David Gill during the visit of the British Association to S. Africa. Lady Wharton and several children survive him.

Otto Wilhelm von Struve was born on the 7th of May 1819 at Dorpat. When he was a child seven years of age the Gold Medal of the Royal Astronomical Society was awarded to his father, Wilhelm Struve, who was Director of the Dorpat Observatory—an honour destined in after years to be conferred on himself, and, in the still more distant future, on his son.

His official connection with astronomy began in 1837, when he commenced to serve as assistant to his father in double-star work at the observatory; at the time he was still a student at the university. Meanwhile the Russian Government, guided by the elder Struve, had established the national Russian Observatory at Pulkowa; and, soon after taking his degree, Otto Struve was appointed, with C. A. F. Peters, to the office of Assistant Astronomer there. His energies were now devoted chiefly to

fundamental determinations; using 400 stars, of which the majority were double stars observed by his father at Dorpat, he undertook an exhaustive investigation on the constant of precession and the proper motion of the solar system. The results were communicated to the Academy of St. Petersburg in November 1841, and printed in their Transactions. This memoir furnished the occasion of the Royal Astronomical Society's award of their Gold Medal in 1850, the author having been elected an Associate two years previously.

In 1852 he became a member of the St. Petersburg Academy of Sciences, and in 1862 succeeded his father as Director of the Pulkowa Observatory, with which institution his whole scientific life is identified. His work centred now, as before, chiefly on double stars and fundamental astronomy; but he took the greatest interest in geodetical investigations, and as consulting astronomer to the general staff and to the hydrographical department he was the chief adviser of the Russian Government in matters related to astronomy and geodesy. Co-operative enterprises found in him a zealous promoter, and with the great Zone Catalogue of the Astronomische Gesellschaft his name will always be associated.

The double stars of Otto Struve were naturally of a more difficult class than those of his father, the instruments being respectively a 15-inch and a 9·6-inch. The measures were collected and discussed by Professor Hussey in 1900. One of his stars, δ *Equulei*, has the shortest period (5·7 years) of any known visual binary. An interesting feature of Struve's work was his unusually large personal equation in the measurement of position angles of double stars; by experiments with artificial stars he was enabled to deduce satisfactory formulæ for correction.

A discussion of the measures of *Saturn's* rings, in which he introduced the nomenclature now used, led him to the conclusion that the inner ring is approaching the planet. This has not been confirmed by more recent measures.

In 1873 he was elected a Foreign Member of the Royal Society.

In 1889, on the fiftieth anniversary of the foundation of Pulkowa Observatory, he retired from the directorship, to which Bredichin was then appointed. The remainder of his life was spent at St. Petersburg, and latterly at Karlsruhe.

Struve died on the 14th of January 1905. He had been twice married, but his second wife predeceased him by some years. The astronomical tradition of the Struve family is worthily maintained by his son, Dr. Hermann Struve, who is an Associate and Gold Medallist of the Society.

Pietro Tacchini was born in 1838 at Modena. He graduated as a prizeman in Engineering at the Academy of Modena, and afterwards studied astronomy at the Observatory of Padua. At the early age of twenty-one years he was called to take