

OBITUARY.

GEORGE BIDDELL AIRY was born on the 27th of July, 1801, and died on the 2nd of January, 1892. His father was a Lincolnshire man, and his mother a member of the well-known family of Biddell of Suffolk, but he was born at Alnwick in Northumberland, where his father (who was connected with the Inland Revenue Department) happened to be stationed at the time. He was educated chiefly at the Colchester Grammar School, and a great part of his time was spent with his uncle at Playford, near Ipswich. At this village Thomas Clarkson, "the friend of slaves," resided. He was much struck by the ability and practical mind of the boy; and it was mainly due to his earnest advice that young Airy was entered at Trinity College, Cambridge. His college career was very brilliant, and he came out as Senior Wrangler in 1823. He was elected Lucasian Professor in 1826, and delivered an annual course of lectures on Experimental Physics which made a great impression on all who attended them. In 1828 he was elected Plumian Professor of Astronomy, in virtue of which he became Director of the Cambridge Observatory. He had already written various important treatises on Gravitational Astronomy, such as "The Lunar and Planetary Theories," "The Figure of the Earth," &c.; he now turned his attention to the practical working of an observatory, and introduced improvements of the highest value in the reduction and publication of observations. In 1830 he married a daughter of the Rev. Richard Smith of Edensor, Derbyshire.

Mr. Airy was appointed Astronomer Royal in 1835, which post he held until 1881. Under his energetic management every department of the Observatory at Greenwich was wholly re-organized. The methods which had been found so efficient at Cambridge were adopted, and the observations were reduced and published with unvarying punctuality. He designed and introduced new instruments far superior to the old ones in power and in mechanical construction. A magnetic observatory was established, and magnetical and meteorological observations were recorded daily. A vast work of great importance to astronomy, viz., the reduction of the Greenwich observations of the moon and planets, which had accumulated since 1750, and which in their

unreduced condition were totally useless to astronomers, was undertaken and completed after many years' labour. In addition to his regular routine work, he observed the total eclipses of 1842, 1851 and 1860, and organized the British expeditions for the observations of the Transit of Venus in 1874. In 1854 he determined the mean density of the earth by pendulum experiments in the Harton coal pit, thus at last accomplishing the object which he had attempted in a mine in Cornwall in 1828, but had failed to carry out by reason of an accident in the working of the pit.

Throughout his long tenure of office Mr. Airy was regarded by the Government as its chief scientific adviser, and was frequently consulted. He was one of the members of the Railway Gauge Commission. He was Chairman of the Commission for re-establishing the Standards of Length and Weight, after the destruction of the old standards by fire, and on various occasions rendered much service to the Standards Department of the Board of Trade. He investigated very exhaustively the cause of the disturbance of the compass in iron ships, and applied efficient remedies. He instructed the officers charged with the duty of setting out the boundary between Canada and the United States, so far as the astronomical observations were concerned. He reported on the cause of the alleged inefficiency of the light in English lighthouses, and on many other matters. He was extremely well versed in optics and mechanics, both theoretically and practically, and this knowledge stood him in good stead in the design of the new instruments required for the Observatory, and of the buildings to contain them. He took great interest in all important engineering works, and from his remarkable knowledge of the principles and theory of construction, and of the strains in ironwork, he was often consulted by Stephenson, Brunel, and other engineers, as to the great works upon which they were engaged.

Mr. Airy was elected an Honorary Member of the Institution on the 28th of June, 1842. He occasionally attended the meetings between the years 1852 and 1877, and spoke on the Papers under discussion. In April, 1858, he addressed to the Institution a Communication entitled "Further Observations, Explanatory of former Remarks, on the Submerging of Telegraph Cables."¹ Again in 1867 he contributed a Paper "On the Use of the Suspension Bridge with Stiffened Roadway, for Railway and

¹ Minutes of Proceedings Inst. C.E., vol. xvii. pp. 298 *et seq.*

other Bridges of great Span,"¹ for which he was awarded a Telford medal. And in 1881 he presented an elaborate set of tables of "Logarithms of the Values of all Vulgar Fractions, with Numerator and Denominator not exceeding 100, arranged in order of Magnitude."² His treatises and writings were very numerous, for any subject which had a distinctly practical object, and could be advanced by mathematical investigation, possessed interest for him. His chief separate publications were the "Mathematical Tracts," chiefly on the lunar and planetary theories and on the undulatory theory of light; the treatise entitled "Gravitation;" an article on tides; the Ipswich lectures on Astronomy; and treatises on Sound, Magnetism, and Errors of Observation. But he contributed many valuable Papers to the Transactions of the Royal Society; the one, perhaps, which attracted most attention amongst astronomers being that on "The Inequality of long Period in the Motions of the Earth and Venus." His connection with the Royal Astronomical Society was very close, nearly all his Papers on purely astronomical matters being communicated to that society. He occasionally contributed articles on miscellaneous subjects to various newspapers and journals. Most of these, and amongst them "The Landing of Julius Cæsar in Britain," were published in the *Athenæum*.

Mr. Airy was a Fellow of the Royal Society (of which he was President from 1871 to 1873), a Fellow of the Royal Astronomical Society (of which he was several times President), and a member of various other learned societies; he was also a Corresponding Member of the Institute of France. He received numerous medals and marks of distinction in recognition of his services to astronomy and science, and was made a Knight Commander of the Order of the Bath in 1872. But of all the honours he received, there was none he valued so much as the Freedom of the City of London, which was presented to him in 1875; the special grounds of this honour were the practical nature of the work he had done, and in particular his valuable investigation and correction of the errors of the compass in iron ships.

The chief features of his character were independence of thought and self-reliance, an extremely practical turn of mind, and a remarkable love of order. His practical nature showed itself in everything he did. His mathematics were always directed to some useful and practical end, for he had a positive aversion to mathematical investigations of a purely speculative

¹ Minutes of Proceedings Inst. C.E., vol. xxvi. p. 258.

² *Ibid.*, vol. lxx. p. 271.

nature. In carrying out an investigation he always kept his object clearly in view, and made for it in the most direct manner, wholly regardless of what may be termed the elegancies of mathematics. Long arithmetical calculations had no terror for him, so skilful was he in expedients for facilitating them. At the same time he was a keen economiser of labour, and was careful to avoid carrying calculation to a greater degree of accuracy than was necessary for the immediate purpose. His love of order was most singular, and might almost be regarded as the ruling feature of his mind. He looked upon mathematics as the handmaid of order; and in the routine work of the Observatory, whether in general regulations, in the arrangement of documents, or in the reduction of observations, order was carried to its extreme limits. Mr. Airy had a very strong constitution, and his regular habits, both of work and exercise, kept him in good health. His custom was to work in his official room from about nine to two, and to dine about half-past three; he then worked in the evening, in the same room with his family, from about seven to ten, where his powers of abstraction were remarkable. He was very fond both of the classics and of general literature, and took special interest in antiquarian investigations. His memory was very tenacious, and was stored with abundance of English poetry, which he often referred to as an ever-present relief and comfort to his mind. He was a man of great simplicity of character, combined with strong common sense, and was nowhere so happy as in the little country village where he had spent much of his youth and with which he kept up a close connection throughout his life.

H.M. DOM PEDRO II DE ALCANTARA, ex-Emperor of Brazil, was born on the 2nd of December, 1825. At the age of five he succeeded to the throne of Brazil on the abdication of his father Dom Pedro I, Bonifacio José de Andrade e Silva being appointed regent. In 1833 a Council of Regency was appointed. During the next few years so many intrigues took place that in 1840 the Chambers declared that the Emperor, although only in his sixteenth year, had attained his majority. On the 13th of July in that year he assumed the reins of government, his coronation taking place on the 18th of July in the following year. On the