

WILLIAM HENRY BESANT was born at Portsea on 1828 November 1, being the son of Mr. William Besant, merchant, of Portsmouth. He was educated at St. Paul's School, Southsea. At the age of 16 he competed for a classical scholarship at Corpus Christi College, Oxford, and was second on the list. Two years later he entered St. John's College, Cambridge, graduating as Senior Wrangler in 1850, and being first Smith's Prizeman. He was elected a Fellow in 1853; in 1859 he vacated his Fellowship, not being in Holy Orders, but resumed it in 1899. He was a mathematical lecturer at St. John's College from 1853 to 1889, and the author of treatises on Conic Sections, Dynamics, Hydro-mechanics, an interesting tract on "The Geometry of Roulettes and Glissettes" (1869), and various mathematical papers. He gained a great reputation as a mathematical coach, and had many distinguished pupils, including Professor W. Burnside, Professor G. B. Mathews, and Professor A. W. Flux. He also took a prominent part in the University, being Esquire Bedell for a time, and Examiner for the Mathematical Tripos in 1856, 57, 85. He also served on many of the Syndicates. He was Examiner in the University of London 1859-64.

He was elected a Fellow of the Royal Society in 1871.

In company with the other famous mathematical coach, Dr. E. J. Routh, he received in 1883 the first Sc.D. given by the University of Cambridge.

The most striking characteristic to one who knew him in later years was his atmosphere of cheerful kindliness, and patience under considerable suffering. For many years before his death he could hardly walk upstairs owing to acute rheumatism, but he did not allow this to interfere with his gaiety of heart. He enjoyed renewing old acquaintances, and continued to retain an interest in the activities of younger men, on many occasions taking pleasure in signing their certificates as candidates for the Royal Society. Desiring to hint to a young examiner that the questions he had set were not altogether suitable, he chaffed him on the "coruscations" he had noticed in the papers. He would often recall his admiration for Maxwell, saying that he never had a conversation with him without gaining a new idea.

To such men as he Cambridge owes a great debt.

He married in 1861 Margaret Elizabeth, daughter of the late Rev. Robert Willis, Jacksonian Professor of Natural Philosophy at Cambridge from 1837 to 1875.

Mrs. Besant died in 1911, and Dr. Besant on 1917 June 2, at the age of 89. He leaves two sons and one daughter.

He was elected a Fellow of the Society on 1854 February 10, and was our oldest Fellow at the time of his death.

ARTHUR MATTHEW WELD DOWNING was born at Carlow on 1850 April 13. He was the younger son of Arthur Matthew Downing of Co. Carlow, and received his early education under Mr. Philip Jones at Nutgrove, then a well-known school near Rathfarnham,

Co. Dublin. From Nutgrove he passed to Trinity College, Dublin, where he had a distinguished career, specialising in mathematics, and obtaining the scholarship in science in 1871, in the winter of which year he graduated as B.A., taking his M.A. degree ten years later. In 1893 the University granted him the honorary degree of Doctor of Science.

In 1872 an open competition was held under the Civil Service Commission for the appointment of an assistant at the Royal Observatory, Greenwich, in which Downing was successful, entering on his official duties on 1873 January 17. The character of the position which he thus won was entirely congenial to him, his somewhat reserved nature and methodical habits finding satisfaction in the retired life and orderly routine of the Observatory. His mathematical tastes led him to find pleasure in computations, and during the greater part of his nineteen years at Greenwich the reductions of the Circle observations, and, later, those of the Altazimuth and Equatorial observations, were carried out by him or under his superintendence. For over ten years the care of the library and manuscripts was also in his hands, and for nearly the whole of his time at the Observatory he was one of the four regular observers with the Transit-Circle and Altazimuth.

Downing had not been long at Greenwich before he made himself known by the papers on the astronomy of precision which he communicated to this Society, the first of these being a short note on "A Determination of the Semi-diameter of Venus at the mean distance of the Sun from the Earth," appearing in the *Monthly Notices* for 1877 May. A series of more than thirty papers followed, dealing with the comparison of star places in different catalogues, their correction for systematic errors, the computation of proper motions, and other inquiries important in fundamental astronomy. These won him a reputation as an able and conscientious worker in this essential but less popular side of the science, and when, in 1891, Dr. J. Russell Hind, Superintendent of the *Nautical Almanac*, resigned his post, Downing was clearly marked out as his proper successor, and entered upon his new appointment on 1892 January 1.

Here began his real life-work, for which his natural bent, his education at Dublin, and his experience at Greenwich had admirably fitted him. The quiet, withdrawn, old-world corner of Gray's Inn, the responsible routine of the computations for the "Seaman's Bible," varying so little from one year to another, were exactly fitted to his temperament. Of undoubted ability, shrewd, determined, and far-seeing, and possessed of a great amount of energy, the *Nautical Almanac* was in safe keeping in his hands, and during the years he held the post his mental alertness suggested a number of alterations and improvements which he carried out most successfully. In particular he greatly increased the number of "Nautical Almanac Stars," earning thereby the gratitude alike of astronomers, seamen, and surveyors. Under his hand also additions were made to the section of planetary satellites, and

physical ephemerides of the planets were introduced. On the other hand, he witnessed the demise of "lunar distances," that hoary method that had well served its day and generation.

Methodical himself in all his work, punctilious and careful, cautious and straightforward in all official matters, he set the highest value on the work of his staff, and as a trained, practical observer knew how to insist on the need for extreme accuracy throughout the various calculations. To his knowledge of mathematics he added decided skill in computation, but although he was less liable than most men to make mistakes, he in no case allowed himself to dispense with the most scrupulous revision of any work that he had in hand. His extensive command of dates and figures did not, however, always save him from an occasional blunder, and it was a joke against him that on one occasion he dated a cheque two years ahead, the cheque coming back with a notification that it was post-dated. After all, it was a natural mistake for one to make whose main work was wholly devoted to events due to occur some years ahead.

In addition to his strictly official work, the queries that were showered upon him were many and varied, relating to chronology, the calendar, eclipses, astronomical constants, the construction of the *Nautical Almanac*, and kindred matters. One inquirer perhaps wanted to know the exact time of some full moon of a century ago; another, its age on the night of the Gunpowder Plot. Or such inquiries might be made of him as, "What was the time of high water at Dover when Julius Cæsar landed in August 55 B.C.?" Every inquiry of a sensible character received prompt attention, and even faddists and cranks were kindly dealt with when their peculiarities were confined within certain prescribed limits.

An extensive piece of work which occupied seven years of his official life was his revision of Taylor's *General Catalogue of 11,000 Stars for the Equinox, 1835.0, from Observations made at Madras Observatory, 1831 to 1842*. This work was a natural sequel to the numerous and important contributions he had made in previous years to this branch of sidereal astronomy. In his preface he says "That his (Taylor's) work may now be rendered more useful to astronomy is the reward for which I hope in the publication of this revised edition," and that aim and hope illustrate the keynote of his character. He found the question of the expected reappearance of the Leonids an interesting and profitable study for several years, during which he collaborated with the late Dr. Johnstone Stoney in an attempt to construct an ephemeris of the densest portion of the swarm. The calculations appertaining to this were made at H.M. *Nautical Almanac* Office under his superintendence, and went to show that the failure of the shower to reappear at the end of last century was probably due to the perturbations of the meteors by the action of Jupiter, Saturn, and Uranus, while the meteors were travelling at a great distance from the Sun. The main body of the swarm was thus

made to pass at a distance of nearly  $1\frac{3}{4}$  millions of miles from the Earth's orbit.

Downing's term of office at Gray's Inn was marked by special efforts at co-operation between similar departments in other countries with the view of avoiding duplication of work, and led to the holding in Paris, in 1896 May, of an International Conference on Fundamental Stars, and the results of the Conference, the inauguration of which was due to him, were far-reaching.

In later years illness troubled Dr. Downing considerably and appeared to intensify his natural reserve. He retired from the *Nautical Almanac* in 1910 on completing the sixtieth year of his age. It is the testimony of a member of his staff who was with him throughout the years of his Superintendency, that "he was at all times fair, courteous, and considerate; he always consulted the interests of his staff, and was in every worthy movement a sympathetic helper."

His work at Greenwich Observatory and the *Nautical Almanac* represented his professional work in astronomy. But his interests were not limited to this, and he took a keen interest in what may be called amateur astronomy. Thus he had an important part in the founding of the British Astronomical Association, an Association especially intended for the help and organisation of amateur observers. He became its second President, 1892-1894, and for many years was a Member of its Council. He was the Secretary and organiser of its first Eclipse Expedition—viz. that to Vadsö—to observe the total eclipse of 1896 August 9, and the failure of the expedition from an astronomical point of view, owing to cloudy weather, was a great disappointment to him; its social success and the strength which it gave to the young Association were some compensation for his trouble. It should be noted, as showing his interest in eclipse problems, that during his term of office at Gray's Inn he was wont to issue circulars for the convenience of eclipse observers, giving local particulars of the times of occurrence and other helpful data in the case of notable eclipses.

He communicated in all seventy-five notes and papers to the *Monthly Notices*. He served nineteen years on the Council, during three of which he was Secretary and two Vice-President.

He was elected a Fellow of the Royal Society in 1896.

Reviewing Dr. Downing's career as a whole, it might be summed up by saying that the talents he displayed were sober and solid rather than brilliant, but the useful work which he accomplished entitles him to an honourable place among professional astronomers.

During his last years he suffered much at times from a painful affection of the heart, and the end came very suddenly on 1917 December 8. He leaves a widow and one daughter.

He was elected a Fellow of the Society on 1875 March 12.

W. F. D. and E. W. M.

PAUL WYNYARD FAIRCLOUGH was born in South Australia in 1852. During the early sixties he went with his parents to reside in New Zealand at the time of the gold rush there. Educated for the purpose in Sydney, he entered the ministry of the Methodist Church in 1872, and served in that capacity in New Zealand with conspicuous success for forty-three years, occupying various posts of honour therein. He was eventually elected President of the Wesleyan Conference in 1897. These positions were conceded to him not because he sought them, but because of his personal gifts and fitness. For several years he held the office of editor of the denominational paper. He was a man of distinct individuality. In all departments of intellectual activity he manifested a keen interest. He excelled on the platform as well as in the pulpit. His oratory was clear, thoughtful, and convincing. On Imperial questions Mr Fairclough was ever in great demand, and responded with masterly eloquence. Astronomical circles were always enriched by his presence and activities, and he was ever ready to serve them with well-prepared and up-to-date contributions. He was one of the Vice-Presidents of the Dunedin Astronomical Society, which owes much to his administrative wisdom and guidance. Several of his papers on scientific — mainly astronomical — subjects were read before the philosophical societies of New Zealand, and some of these appear in the *Transactions of the New Zealand Institute*. Mr Fairclough was unexcelled as a writer of monthly astronomical notes, and he rendered a signal service to our science in that way alone. His love for astronomy was a genuine passion. As a writer and speaker Mr Fairclough's style was incisive, clear, penetrating, epigrammatic, and was often marked by rich humour. His very appearance roused expectations, and none were disappointed in him, though he was often reticent and reluctant to reveal himself. His stalwart manliness, his kindly and practical interest in those whom he believed in and could help, together with his scorn of littleness, drew to him all who were privileged to know him. He quietly passed away on Wednesday, April 18th, shortly after an operation upon which heart failure supervened, leaving his widow (formerly Miss Aiken, of Canterbury), one daughter, and three sons to mourn their loss.

He was elected a Fellow of the Society on 1900 January 12.

[The Council are indebted for the above notice to Rev. B. Dudley.]

ALEXANDER FOOTE was born at Rosehill, Forfarshire, in 1850 August, and died at Newland House, Bath, on 1917 June 6. After leaving Trinity College, Oxford, where he took honours in Moderations, he entered for the Bar, but his great love for music led him to abandon the law as a profession, and he spent some time in Italy in the study of music. Returning to Scotland in 1873, he joined the Royal Company of Archers, the King's Bodyguard for Scotland. A serious illness having left him in poor health, he was unable to take any very active part in public affairs, and