

Sir Frank Watson Dyson, K.B.E., D.Sc., LL.D., F.R.S.

SIR FRANK WATSON DYSON was born on January 8, 1868, at Ashby, Lincolnshire. He was educated at Bradford Grammar School and proceeded to Trinity College, Cambridge, graduating as second Wrangler in the Mathematical Tripos of 1889. In 1891 he was awarded a Smith's Prize and was elected a Fellow of Trinity, and in 1892 he was elected to an Isaac Newton Studentship. It is interesting to note that the first two holders of this studentship subsequently came to Edinburgh as Astronomers Royal for Scotland, the first Isaac Newton Student being R. A. Sampson who was elected in 1891.

At this period Dyson was engaged in research on potential theory, and one of his earlier papers was on "The Motion of a Satellite round a Spheroidal Planet." But in 1894 he was appointed Chief Assistant at the Royal Observatory, Greenwich, a position which he held until 1905. During this period he was intimately concerned with work on the Greenwich section of the Astrographic Catalogue, but his most important contribution to astronomical knowledge was the reduction, in collaboration with W. G. Thackeray, of the transit observations of more than 4000 circumpolar stars, made by Stephen Groombridge at Blackheath between the years 1806 and 1816. By comparison with modern observations these observations yielded proper motions of high accuracy, and thus provided material for the investigation of problems relating to stellar motions. The results of this heavy piece of work were published in 1905 and their appearance was most opportune, for in the previous year Kapteyn had announced his discovery that the stars could be separated into two large "streams" which were in motion relatively to each other. This result was based on an analysis of the motions of the brighter and nearer stars, but in 1906 A. S. Eddington analysed the motions of the Groombridge stars. This investigation confirmed the phenomenon of star-streaming, and extended it to the fainter stars.

In December 1905, subsequent to the death of Professor Ralph Copeland, Dyson was appointed to the conjoint posts of Astronomer Royal for Scotland and Professor of Astronomy in the University of Edinburgh. At the time of his appointment the Royal Observatory, Edinburgh, was engaged on a programme of meridian observations of a list of zodiacal and other stars prepared by Sir David Gill. This programme was finished under the supervision of Dyson, who personally devoted a great deal of time to the work of reduction, and the results were published in 1910 as Volume III of the *Annals of the Royal Observatory, Edinburgh*. Spectroscopic work on the Sun's rotation was also

continued by J. Halm and subsequently by J. Storey, under Dyson's direction, and in 1908 a new programme of double star work was initiated which was continued up to 1915. An important addition to the work of the observatory consisted in the scheme of co-operation with Perth Observatory, Western Australia, whereby the plates for a large section of the Perth Astrographic Zone were measured and reduced at Edinburgh. Dyson threw himself into the supervision of this work with characteristic energy and enthusiasm.

During his tenure of office in Edinburgh Dyson published an important paper confirming the phenomenon of star streaming (see above), which had been received with cautious scepticism by many astronomers. It was felt that the results obtained by Kapteyn and others might be due to errors in the proper motions, but in 1908 Dyson completed an analysis, restricted to the stars of large proper motions, for which the possible errors amounted to a small fraction of the whole. This analysis showed decisively the reality of star-streaming. It was published in the *Proceedings of the Royal Society of Edinburgh* (vol. xxvii, p. 131), and this paper is now regarded as one of the classics on the subject of stellar motions. Another paper which analysed stellar motions in a rather different way, and which again confirmed the existence of a preferential direction of motion for the stars (apart from systematic motions due to the motion of the solar system) was published in March 1910 in the *Monthly Notices of the Royal Astronomical Society*.

On October 1, 1910, Dyson returned to Greenwich as Astronomer Royal, being succeeded at Edinburgh by R. A. Sampson. For the next 23 years he guided the fortunes of Greenwich wisely and well. Whilst meridian work was pushed forward with unabated vigour other programmes were successfully undertaken. Our knowledge of the stars in the Greenwich zone of the Astrographic Catalogue has been enriched by the successful prosecution of the Greenwich parallax programme. The whole zone was re-photographed with the astrographic telescope, and proper motions derived for stars down to the 13th magnitude. Determinations of photographic magnitudes in the zone were undertaken. The magnetic work of the observatory was developed and solar work prosecuted with unabated zeal. Double star work was continued and a programme of colour temperature observations initiated. An important branch of geophysical work which Dyson fostered was the determination of latitude variation. He constantly endeavoured to improve the accuracy of determinations of time. And even in an abbreviated notice reference must be made to his eclipse activities and to the fact that it was due to him that the two expeditions were sent to photograph the total solar eclipse of May 29, 1919. He had noticed in 1917 that at this eclipse

the sun would be in almost the most favourable possible position for testing the deflection of light predicted by Einstein's General Theory of Relativity, and in spite of the discouraging conditions of 1918 preparations for the eclipse proceeded. The confirmation of the Relativity Theory secured by the 1919 expeditions is now a matter of history, and it was due to Dyson that they were able to set out at all.

Essentially a team-worker, Dyson proved himself to be an ideal leader of an astronomical team. To a large extent he encouraged his subordinates to act on their own initiative, but they constantly consulted him on all matters as they realised that his advice was invaluable. He knew how to command the affection as well as the respect of those whom he led. One of the Greenwich staff once remarked, "all that our chief asks is that we do our best," and it was practically impossible for anyone not to do his best if he was fortunate enough to work under Dyson.

Towards the close of Dyson's tenure of office at Greenwich a fine 36-inch reflecting telescope, with its building and accessories, was presented to the observatory by Mr William Johnston Yapp, who stated that he made this gift specifically to commemorate Sir Frank Dyson's services as Astronomer Royal. At about the same time, as a result of Dyson's representations, the Admiralty sanctioned the construction of a new reversible transit circle which would replace the existing instrument. The acquisition of these instruments at the close of Dyson's official career has been of great value to Greenwich.

Subsequent to his retirement in 1933 Dyson lived in the neighbourhood of Greenwich Park, and his advice was much in demand and always available to his astronomical friends. He had married Caroline Bisset Best, daughter of Mr Palemon Best, M.B., and there were two sons and six daughters of the marriage. Astronomers from all parts of the world, in addition to Dyson's immediate colleagues, were always sure of a warm welcome in their home. Lady Dyson died in 1937 and Sir Frank followed her on May 25, 1939, his death occurring whilst on the return voyage from a visit to Australia.

Dyson received many honours. Among these may be mentioned a Royal Medal of the Royal Society in 1921 and the Bruce Gold Medal of the Astronomical Society of the Pacific in 1922, in addition to the Gold Medal of the Royal Astronomical Society which was awarded to him in 1925. He was created a Knight Bachelor in 1915 and a K.B.E. in 1926. He received honorary degrees from numerous universities, and was foreign or corresponding member of various national academies. He was elected a Fellow of the Royal Society of Edinburgh in 1906.

See also *Obituary Notices of Fellows of the Royal Society*, vol. iii, No. 8, 1940, pp.159-172.

W. M. H. G.