

William Wallace Campbell, For. Mem. R.S., Hon. F.R.S.E.

THE tragic death on June 14, 1938, of William Wallace Campbell removed from the list of Honorary Fellows of the Society a great astronomer and a wise and firm administrator. For over twenty years he was Director of the great Lick Observatory, and it was only as a result of heavy pressure that he consented in 1923 to accept the office of President of the University of California. He had previously refused many important posts on the ground that he preferred the Directorship of Lick to anything else, and even when he was persuaded by a deputation from the University that they were really in need of his outstanding administrative ability, it was his earnest hope that his term of office would be short. He accordingly retained his title of Director of the Observatory in the expectation that he would return to the institution he loved so well, but the task that awaited him was heavy and kept him until his health failed in 1930.

Campbell will remain renowned for his development of the spectroscopic determination of the components of stellar velocities in the line of sight. As early as 1906 his work in this field had earned the Gold Medal of the Royal Astronomical Society, and the Lick Catalogue of Radial Velocities published in 1928 is perhaps the best monument to his memory. This catalogue bears the names of Campbell and of his colleague Moore, and contains the radial velocities of 2760 stars with a complete discussion. The systematic observation of radial velocities has assisted, to a very high degree indeed, the efforts of astronomers to understand the kinematics of the Stellar Universe, and William Wallace Campbell has for long been in the van of this line of research, and has proved himself pre-eminent as an observer, as an organiser, and as one who knew how to extract full information from his observational material. Mention must also be made of his verification, in 1922, of the Einstein gravitational displacement of light, thereby confirming the results of the British observers in 1919.

Campbell joined the staff of Lick in 1891 and became Director in 1901. The success of his work is directly due to his high instrumental skill. Prior to his appointment as Director he set himself the task of designing a spectrograph for the specific purpose of determining radial velocities with all possible accuracy. Thanks to the generosity of Dr D. H. Mills funds were available, and the Mills spectrograph exceeded all expectations, incorporating as it did freedom from flexure, provision for accurate

guiding and efficient temperature control. Between August 1896 and August 1898 several hundred spectra were obtained, and the radial velocities of some fifty stars were measured with hitherto unprecedented accuracy. But Campbell was not satisfied, and, utilising Wright's suggestions, for the further elimination of residual flexure, he proceeded to the design of improved Mills spectrographs. By 1909 he was able to determine the solar motion from the radial velocities of 1047 stars, and at the same time made the surprising discovery of what is known as the K Term. In subsequent years the work of measuring radial velocities of stars was pushed steadily forward, but Campbell found time for important spectroscopic researches on Planetary Nebulæ, Novæ, Wolf Rayet stars, the Orion Nebula, and the composition of the atmosphere of Mars. An important by-product of the radial velocity programme was the discovery of the high percentage of close binary star systems existing among the stars.

Even in an abbreviated notice mention must be made of Campbell's eclipse work and his contributions to the study of the Solar Chromosphere. He took part in seven eclipse expeditions and designed a simplified equatorial mounting which was sufficient for the restricted movements needed. An essential feature of the design was its portability, and it has been adopted by many other astronomers. He also introduced a new feature into the photography of the flash spectrum whereby the spectrum of the Sun's edge was recorded continuously for a few seconds at the commencement or end of totality by means of plate-holders moving at a uniform rate by clockwork. This device exhibits very strikingly the different depths at which different Fraunhofer lines are reversed.

In spite of increasing blindness and failing health, Campbell accepted the Presidency of the National Academy of Sciences from 1931 to 1935. The work was exacting and he had to move to Washington. He devoted himself to maintaining the prestige of the Academy, and was instrumental in the creation within the Academy, on the invitation of the President of the United States, of the Government Relations and Scientific Advisory Committee, a body which advises the President and various Government departments on scientific matters. The National Academy of Sciences profited to a considerable degree from their President's high executive ability and tenacity, and his end is the passing of one who, in addition to being a great astronomical pioneer, played an important part in American scientific and academical life.

He was elected an Honorary Fellow of the Society in 1920.

See also *Obituary Notices of Fellows of the Royal Society*, vol. ii, 1936-38, pp. 613-619.

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