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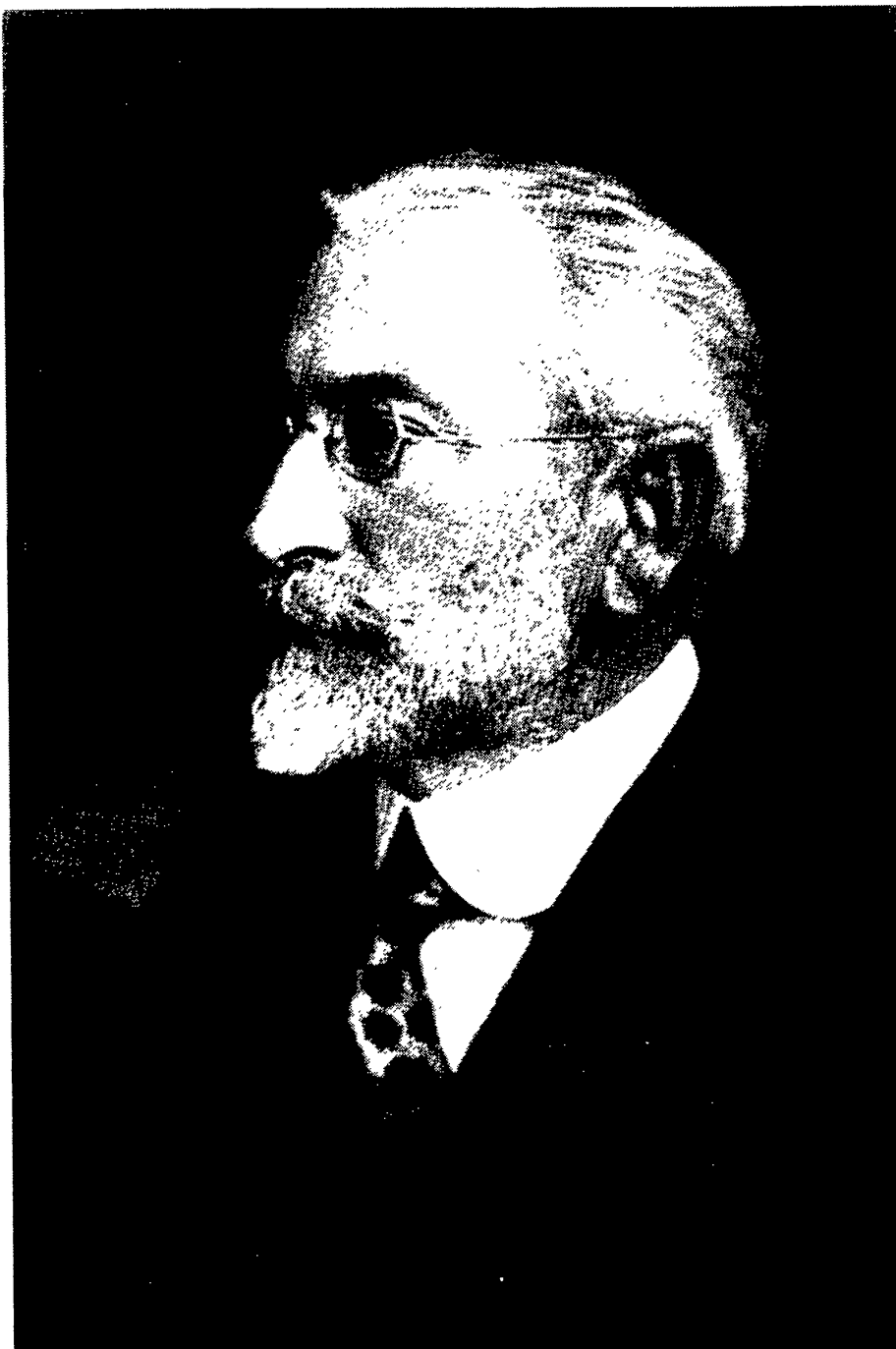
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## FERDINAND ELLERMAN

BY WALTER S. ADAMS

The death of Ferdinand Ellerman on March 20, 1940, brought to a close a life intimately associated with the development of two of the great American observatories, Yerkes and Mount Wilson. He was connected with both institutions from their beginnings, and he brought to both a deep interest and loyalty, remarkable skill in observing and in instrument design, and an unfailing spirit of friendly co-operation. It is impossible to assess in any adequate way the numberless contributions he made to both observatories, especially during their formative years. As a close associate and co-worker with Dr. Hale for more than forty-five years his share in the series of brilliant discoveries in solar physics which characterized Hale's remarkable life was very great and was recognized by no one more fully than by Hale himself.

Ellerman was born in Centralia, Illinois, on May 13, 1869. His education was at the local high school, and from there he went to Chicago, where he secured a position with the James S. Kirk Company. He early developed an interest in photography and in the use of machine tools, in both of which fields he became exceptionally skillful and proficient. At this time Hale was engaged in his early work on the sun at his private observatory at Kenwood and, requiring the help of an assistant, offered the position to Ellerman. The association thus begun in 1892 continued until Hale's death in 1938. The combination of these two men was a very strong one, the active, brilliant mind of Hale constantly raising new problems in methods and apparatus in the solution of which the experience and rare observational skill of Ellerman were invaluable. Together they solved the intricate difficulties connected with the spectroheliograph, then under de-



FERDINAND ELLERMAN

sign by Hale, and made of it a fundamental instrument for solar research. The thousands of photographs of solar and laboratory spectra, and of prominences, flocculi, and other phenomena of the sun's surface made during the brief history of the Kenwood Observatory bear witness to the industry and enthusiasm of these remarkably productive collaborators.

With the establishment of the Yerkes Observatory in 1895 Ellerman took an active part in the plans for the equipment, especially of the spectroheliographs and the solar and stellar spectrographs. He devoted most of his time to observations with the Rumford spectroheliograph, which in his skillful hands produced a wealth of exceedingly valuable material. He was equally at home in stellar research, however, and the long series of photographs of the spectra of stars of Secchi's Fourth Type was an admirable illustration of an investigation carried on under serious difficulties with great skill and exceptional resourcefulness.

When Hale commenced to investigate the possibilities of Mount Wilson as a site for a solar observatory he had almost from the beginning the benefit of Ellerman's wide experience in observations of the sun. Coming in March 1904, Ellerman remained with the growing observatory until his retirement in 1938. At a period when all transportation was by pack train and instruments were often improvised and experimental in character, his versatile abilities were constantly in demand. His photographic observations of the spectra of sunspots made with the Snow telescope provided nearly all the material for the first Mount Wilson Map, the basis for many of the important investigations which followed. His work with the spectroheliograph in collaboration with Hale led directly to the discovery of solar vortices, and these in turn led Hale to his remarkable discovery of the magnetic field of sunspots. This was in 1908. In the years which followed, Ellerman carried on many of the extensive observations involved in the study of the sun's general magnetic field and in the systematic measurement of the polarities of sunspots which resulted in the discovery of the reversal with the sunspot cycle of the sign of the magnetic field in both solar hemispheres.

Throughout his life Ellerman was a skillful and enthusi-

astic photographer, and most of the valuable photographic records of the early construction period of the Observatory were due to his foresight and industry. The preparation of reproductions for illustrations in publications was almost wholly in his hands, a field in which his technical skill and knowledge of the scientific aspects of the problems involved formed an exceedingly valuable combination. Whether in connection with photographic processes or instrumental technique, Ellerman's judgment and experience were such that his associates constantly consulted him for advice and always with excellent results. In recent years when the question of the site for the 200-inch telescope was under consideration, Ellerman took an active part in the observations at various stations, and his results were assigned important weight in the final decision upon the location.

Apart from his scientific work Ellerman had many interests especially in outdoor life and sports. He almost completely overcame the handicap of the loss of the sight of one eye, which occurred when he was at the Yerkes Observatory, and became an able and enthusiastic golf player. His interest in nature and the natural surroundings of a mountain top was keen and intelligent and no one could be a more valued companion on a fishing trip or a mountain-climbing expedition. In his home community of Pasadena he took an active part in civic affairs and was often in demand as a lecturer on some of the popular aspects of astronomy. In all his activities his friendliness, humor, and desire to aid endeared him greatly, not only to his colleagues but to everyone with whom he came in contact.

Ellerman was a member of the Astronomical Society of the Pacific and of the American Astronomical Society. In 1912 the honorary degree of Master of Arts was conferred upon him by Occidental College in recognition of his contributions to astronomy.

After his retirement from active work at the Observatory, Ellerman still kept in touch with its activities and often visited his old friends and associates. During the past year, however, the gradual development of a heart affection weakened him considerably, and when an attack of influenza turned into pneumonia the end came suddenly and unexpectedly. His wife,

Hermine Hoenny, and his daughter, Mrs. Louise Burnett, survive him. The sympathy of all who knew him throughout the years of his devoted service to the Observatory goes out to them in the fullest degree.

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