

George E. Hale

By Seth B. Nicholson *

Dr. George E. Hale died in Pasadena, California, on 1938 February 21, after an illness with which he had contended courageously for several years. Loved and honoured by all who knew him, he will always be remembered for his many remarkable achievements in solar astronomy and for his extraordinary ability as a founder of organisations for scientific research. His interests were so broad and the important institutions with which he was actively associated are so well known that it is easy to lose sight of his own ability as a scientific investigator. He pursued his researches with marvellous ability and a contagious enthusiasm that made a visit to his observatory or study an inspirational experience never to be forgotten.

The results of his investigations in astrophysics are so well known that reference need be made here only to some major contributions to solar astronomy, the field in which he first worked and to which he always returned from other activities. The invention and perfection of the spectroheliograph and the spectrohelioscope are outstanding examples of his inventive genius. He not only perfected these specialised instruments, but observed most efficiently with them, probing into the mysteries of the Sun and fitting each newly observed fact into a consistent picture of the Sun as a whole. Solar vortices always thrilled him, and in the laboratory, with a tank of water on which rested a layer of smoke, he made miniature vortices, seeing in them analogies to those on the Sun and getting from them suggestions for new solar observations.

Always eager to adapt new scientific methods and theories to solar problems, he saw the possibility that magnetic fields might be produced in solar vortices and realised that the peculiar behaviour of lines

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in the spectra of spots might be due to the newly discovered effects of a magnetic field. Months of careful observation testing the polarisation of magnetically affected lines in laboratory sources and in sunspots left no doubt that another mystery of the Sun had been solved. He soon realised that the huge vortices in the chromosphere over sunspots did not cause the magnetic fields, but were probably a secondary result of the hydrodynamic and magnetic fields of force associated with them. The provisional theory was abandoned as soon as it was shown to be doubtful, but the truth to which it led was demonstrated beyond doubt. Such directness and simplicity of attack were characteristic of his scientific methods.

His love for observing and the desire for better and more accurate observations were the incentive to build the large tower telescopes with their underground spectrographs for solar research, and a 40-inch refractor, a 100-inch reflector, and at last a 200-inch reflector for stellar research. A natural leader of men, his eagerness and enthusiasm never failed to make those with whom he talked wish to contribute something to his projects. Men of means were inspired to co-operate financially in the promotion of cultural achievement and scientists in all fields were enlisted under his leadership in great co-operative organisations. The Yerkes Observatory of the University of Chicago, the Mount Wilson Observatory of the Carnegie Institution of Washington, the California Institute of Technology, the *Astrophysical Journal*, the International Astronomical Union and the National Research Council are direct results of his ability to organise and to stimulate others to work for the advancement of knowledge. He was indeed a true citizen of the world, yet, with all his world-wide activity, found time to take an active, although usually a silent, part in the cultural development of the city where he lived.

Dr. Hale's contributions to science were recognised everywhere and the honours conferred upon him were many and great. He was a member of the leading academies and scientific societies of the United States, England, France, Italy, Holland, Sweden, Norway, Belgium, and of several other countries; he was elected President of the International Council of Scientific Societies in 1931 and served as a member of the Committee of Intellectual Co-operation of the League of Nations in 1922. He was a foreign member of the Royal Society of London and an associate in the Institute de France (Académie des Sciences). The honours bestowed upon him were more than a recognition of his scientific ability: they were an expression of appreciation for the help and inspiration he gave to everyone.