

PROF. PERCIVAL LOWELL.

BY the death, on November 12, of Percival Lowell, who equipped the Observatory at Flagstaff, Arizona, and planned its work with such conspicuous success, astronomy loses one of its most ardent disciples and enthusiastic observers. Prof. Lowell was born in Boston on March 13, 1855, and took his degree at Harvard in 1876. He lived in Japan at intervals from 1883 to 1893, and in the former year was appointed Counsellor and Foreign Secretary to the Korean Special Mission to the United States. His experiences of Eastern life were described in several memorable volumes, namely, "Chosön: a Sketch of Korea," "The Soul of the Far East," "Noto: an Unexplored Corner of Japan," and "Occult Japan." His other publications include "Mars," published in 1895, "The Solar System," "Mars and its Canals," "Mars as the Abode of Life," "The Evolution of Worlds," and several fine volumes of "Annals of the Lowell Observatory." In 1902 he was appointed non-resident professor of astronomy of the Massachusetts Institute of Technology, and in 1904 he received the Janssen medal of the French Astronomical Society for his researches on Mars. He had many admirers in this country, and was always ready to assist enterprises having the advancement of knowledge as their object. An illustration of this characteristic was the support which he gave to the Hill Observatory, Sidmouth; and he had the distinction of being the only one outside Great Britain who contributed financially to the endowment of this new observatory.

Prof. Lowell's energy and confidence were infectious; he inspired many amateurs with worthy ambitions, and encouraged a wide interest in the results of observation. For the last twenty-five years he had given undivided attention to astronomy, and made a well-recognised reputation by his researches on planetary markings and by his insistence on the bold deductions that he considered his observations warranted. Whatever opinion may be held as to the deductions and interpretations to which he was led, astronomical science has benefited by the unflagging zeal with which he pursued his investigations, the undoubted sincerity which inspired his work, and the care he exercised to guard himself against self-deception.

Foremost among these precautions may be noted his care in selecting a suitable site for his observatory. He planned reconnoitring expeditions furnished with adequate and identical optical equipment to various continental and insular stations where favourable conditions might be anticipated, and worked for some time on the arid plains of Mexico before deciding that a somewhat inaccessible peak in Arizona, about 7000 ft. high, offered the ideal conditions for which he was in search. There he erected a 24-in. refractor, and began that series of observations on the surface of Mars and of other objects the critical examination of which offered great difficulties on account of minuteness or lack of definite detail. The

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interest awakened by these inquiries has only been equalled by the controversies to which they have given rise. The study of the surface of Mars in particular was rewarded by the confirmation of Schiaparelli's discovery of a canal system and by the existence of a complicated network of watercourses that assumed various distinct and regularly recurring appearances, depending on the seasonal conditions that obtained. Sometimes the tracks were duplicated, at others they revealed thickened patches, conjectured to resemble the fertile spots known to us as oases. A complete system of planetary meteorology was worked out, the migration of the heat equator was traced with great exactness, and the interchange of wind between the poles and the equator giving rise to cyclonic storms and diurnal effects was discussed with unusual fullness of attractive interpretation.

The ill-defined markings on Mercury and Venus were submitted to a scrutiny not less searching than those of Mars, and Prof. Lowell not only produced substantial evidence that these planets rotate once only in the course of their orbital motions about the sun, but he also determined with some accuracy the position of the axis of rotation, and constructed a trustworthy map of the topographical features of that hemisphere of Venus which is visible to us. The minute discs of Uranus and Neptune, as well as of the satellites of Jupiter, were alike made subjects of the closest study, and much interesting detail was collected. These, with other, researches were carried out with the 24-in. refractor, but quite recently Prof. Lowell added a 40-in. reflector to his observatory equipment, and with the larger aperture was able to confirm the accuracy of much of his previous observations. He was one of the most successful as well as one of the most indefatigable of observers, and we trust that those who have been so happily connected with him in the conduct of the Lowell Observatory will be able to carry on its activities and add fresh lustre to its history.

PROF. LOWELL'S CONTRIBUTIONS TO ASTRONOMICAL SPECTROSCOPY.

THE work at the Lowell Observatory has by no means been restricted to the planet Mars, as may have been popularly supposed. Prof. Lowell provided the observatory with an equipment of the highest class for spectroscopic investigations of the heavenly bodies, and, with the capable co-operation of Dr. Slipher, some important contributions to the advancement of astrophysics have been made. Besides taking part in the general study of the radial velocities of stars, several new and difficult investigations of great interest were undertaken. One of the first problems attacked—in 1903—was that of the rotation of Venus, and although the actual period could not be assigned, the evidence was decidedly in favour of a period much greater than twenty-four hours. More recently the first authentic value of the rotation period of Uranus was determined by Lowell and