THE DEPARTMENT OF ASTRONOMY OF THE UNIVERSITY OF CHICAGO

By Dr. OTTO STRUVE

YERKES OBSERVATORY

THE University of Chicago is celebrating this month its fiftieth anniversary. As a part of this celebration the Yerkes Observatory organized in September a symposium on "Astronomical Spectra," which followed immediately after the annual meeting of the American Astronomical Society. The speakers at the symposium were Dr. R. C. Williams and Dr. L. Goldberg, of Michigan, Dr. R. Wildt and Dr. H. N. Russell, of Princeton, Dr. D. H. Menzel, of Harvard, Dr. M. Schwarzschild, of Columbia, Dr. P. W. Merrill and Dr. R. Minkowski, of Mount Wilson, Dr. A. B. Wyse, of Lick, Dr. G. P. Kuiper, Dr. W. W. Morgan, Dr. P. Swings and Dr. O. Struve, of Yerkes. The discussion ranged from the theory of radiative transfer in stellar atmospheres by Menzel to the peculiar behavior of forbidden emission lines in "symbiotic" stars (*i.e.*, in stars consisting of two or more components of different physical characteristics) by Merrill. Wildt presented new and important ideas concerning continuous absorption by molecules in stellar atmospheres, and Russell reviewed the latest data on the relative abundances of the elements, a problem which has a special bearing upon Bethe's cycle of energy generation. Williams presented the observational results obtained by him and by other workers on the energy distribution of continuous stellar spectra and stressed some serious discrepancies which still exist in the ultraviolet region. Wyse presented new spectroscopic results secured at the Lick Observatory for faint planetary nebulae and discussed the abundances of the elements in these objects. Goldberg discussed the theory of atomic line intensities and gave a comparison of the results obtained from wave mechanics with the observed intensities. Schwarzschild discussed the theory of pulsating stars. Morgan developed the classification of stellar spectra and Kuiper gave his latest summary of observations of several thousand stellar spectra—culminating in a preliminary table of relative abundances of different species of stars in the galaxy. Swings outlined the properties of Wolf-Rayet stars from recent observations at the McDonald Observatory. Minkowski summarized the Mount Wilson observations of supernovae and Struve outlined a working hypothesis for the interpretation of extended stellar atmospheres.

The discussions were exceedingly lively and the attendance was unexpectedly large. We can not hope that each symposium will lead to such a rapid and dramatic climax as the discovery in the laboratory and the identification of interstellar CH^+ by Douglas and Herzberg a few weeks after the Yerkes conference on interstellar molecules,[1] last June, but there can be no doubt that the active workers in stellar spectroscopy who attended the symposium derived much valuable information and inspiration.

Although the Yerkes Observatory was officially dedicated in October, 1897 (at this occasion a conference of astronomers was held at Williams Bay, which organized the American Astronomical Society), the department of astronomy of the University of Chicago also marks its fiftieth anniversary. Exactly fifty years ago Professor George E. Hale undertook at the Kenwood Observatory in Chicago his epoch-making photographic observations of solar prominences and of flocculi on the disc of the sun. In a letter which Mr. Hale wrote in 1923, on the occasion of the twenty-fifth anniversary of the Yerkes Observatory, he described this period in the following words ". . . I must find a way to photograph the solar prominences without an eclipse. When this had been done at Kenwood in the autumn and winter of 1891–92, and when it appeared that a promising opportunity for progress lay in the study of the flocculi which I had found and photographed on the face of the sun, I determined that I must have a larger telescope—one that would carry powerful spectroscopes and spectroheliographs and would give a large image of the sun suitable for the study of the structure of spots, flocculi and prominences."

Apparently the idea of building a large telescope for the University of Chicago came early in 1892. Hale had been corresponding with John A. Brashear, the famous lens maker of Pittsburgh, about a 12-inch photographic objective to serve as a twin for the visual lens which he had obtained for the Kenwood Observatory. The glass had been ordered in 1891 from Mantois in France, but there were various delays in casting the disc, and on March 1, 1892, Brashear suggested that "our American friends are casting a 20-inch flat and if we carry out our wishes we will exhibit a 20-inch objective made of American glass at Chicago." Evidently, the Columbian Exposition of 1893 served as a powerful stimulus to telescope makers, as well as to astronomers! Brashear was seriously ill in the spring of 1892 and during the following summer he undertook a trip to Europe. On

[1] *Astrophysical Journal*, 94: p. 381, 1941.

July 5 he wrote to Hale saying that the Saint Gobain people had quoted a price of $1 per kilo on a 30-inch disc. "Hence a 30-inch disc, 4 inches thick will cost about $135. . . ." In September, 1892, Mr. Charles T. Yerkes agreed to finance the construction of a large telescope, and two forty-inch discs, originally made by Mantois for the University of Southern California, were purchased when it was learned that this institution would not require them. The mechanical parts of the telescope were completed by the Warner and Swasey Company of Cleveland in 1893. The great lens was tested in the optical shops of the makers—Alvan Clark and Company of Cambridgeport, Massachusetts—in October, 1895, and the first astronomical observations were made by Mr. Hale and his associates in the summer of 1897.

OBITUARY

WALTER GRANGER

ONE of the great paleontologists and one of the best-loved men of his generation was taken from us on September 6, 1941, when Dr. Walter Granger died suddenly at Lusk, Wyoming. As for several years past, he had gone to South Dakota to collect fossils with his old friend and colleague Albert Thomson. After attending a field conference of the Society of Vertebrate Paleontology, in the recent organization of which he was active, he was on his way back to the Big Badlands when stricken.

He was born in Middletown, Vermont, on November 7, 1872, the son of Charles H. and Ada Byron Haynes Granger. With little formal schooling, he came to New York as a boy in 1890 and obtained work as an assistant in taxidermy at the American Museum of Natural History, the institution to which he devoted all the rest of his life. His first duties, often graphically recalled, included cleaning the oil lamps along a pathway to the museum and similarly menial tasks. More interesting pursuits were bird and mammal collecting and preparation, in which he acquired permanent skill, occasionally making skins even in his last years.

In 1891 the late Henry Fairfield Osborn came to the museum to establish the Department of Vertebrate Palaeontology, and five years later, in 1896, Professor Osborn had the promising young Walter Granger transferred to this department. Here he worked as an assistant until 1909, then as an assistant curator, 1909–1911, and associate curator, 1911–1926, becoming curator of fossil mammals in 1927. In recent years and until the time of his death he was also curator of paleontology in the Department of Asiatic Exploration and Research. Without academic training, he acquired his knowledge the hard way, but so extensively and so thoroughly that he was a recognized scientific authority in his field as well as a great collector, a fact signalized not only by his rise on the scientific staff but also in 1932 by an honorary D.Sc. from Middlebury College in his native state.

Among his first expeditions was participation in the excavation of Bone Cabin Quarry, Wyoming, beginning in 1897, which resulted in the famous *Brontosaurus* skeleton and other important dinosaurian material. His first scientific publication, a joint paper with Osborn in 1901, was on this collection. In 1903 he was placed in charge of Eocene and Paleocene collecting, and he was in this field every summer from 1903 to 1906, from 1909 to 1914 and in 1916 and 1918. In these years he obtained large collections from almost every known early Tertiary formation of the West. Overshadowed in the public eye by later Asiatic collecting, this work nevertheless was and remains of the utmost importance. It laid the basis for new conceptions and more adequate knowledge of the beginning of the Age of Mammals and resulted in the most remarkable series of primitive mammal remains that has yet been assembled. From the first, and throughout his career, he was not only a collector successful in finding and skilful in preserving specimens, but also a stratigrapher of high rank. His careful observations have played an essential part in the faunal zoning and correlation of much of the Mesozoic and Cenozoic of two continents.

His first foreign expedition was to the Fayûm of Egypt under Professor Osborn in 1907. With the reorganization and expansion of the Museum's Asiatic program in 1921, he was made paleontologist of the Central Asiatic Expeditions and second in command with Roy Chapman Andrews. Aside from the main work in Mongolia, he also collected in Sze-chuan when the party was not in the Gobi. Most of his time was spent in Asia from 1921 through 1931. After 1931 he remained in charge of the preparation and study of the fossil collections of the expedition and in recent years was editor of its publications in all fields, one of the principal tasks in which he was engaged during his last months.

The superb central Asiatic collection resulted from the conjunction of an unparalleled opportunity and a man uniquely qualified to profit by it. Central Asia was the last major untouched storehouse of paleontological riches. Among the thousands of fossils collected, practically every one represented an animal hitherto unknown and vital new evidence of the pageant of ancient life. Some of these specimens are already among the most widely known of fossils: the