those due to the normal atom strong. This is in agreement with observation. Our spectroscopic method of finding the real brightness of stars appears, therefore, in the main to be a method of finding their masses. The immense size of such stars as Antares, with a diameter of about two hundred million miles, affords excellent direct evidence for the existence of the extensive atmospheres predicted by our theory.

I realize fully that in this very condensed statement it has not been possible to touch on some of the most interesting developments of modern physical astronomy, such, for example, as the processes which maintain a star's energy, and the source of supply of its enormous radiation. Yet the conception of how modern physics interprets the spectrum and modern astronomy applies it, and how largely both sciences are based upon the ultimate structure of matter and the nature of radiation, is a most illuminating and inspiring one, however inadequately I have been able to bring it before your minds this evening.

WALTER S. ADAMS
MOUNT WILSON OBSERVATORY

CHARLES HENRY GILBERT

DR. CHARLES H. GILBERT was born on December 5, 1859, at Rockford, Illinois, his parents removing later to Indianapolis. He died suddenly at Palo Alto, on April 20, 1928, from a paralytic stroke. His father, Edward Gilbert, came early from Bohemia, becoming an insurance and realty agent and a pillar of the Congregational Church of Oscar McCulloch, widely known as a philanthropist and as a liberal Christian. His mother, Sarah Bean, still vigorous and competent at the age of ninety-three, is a typical representative of the Massachusetts Puritans at their best, and America has no better stock.

Charles was a graduate of the Indianapolis high school, where he found his first scholarly inspiration under Herbert Edson Copeland, a brilliant young naturalist, one of the ablest Cornell has ever sent out, but who died untimely from a fall into White River in January, 1877. From Indianapolis, Copeland transferred him to his intimate friend, the writer, who had become professor of zoology in Butler University at Irvington, then a suburb of Indianapolis. Gilbert took from the University of Indiana in 1883 the degree of Ph.D., the river fishes being his specialty. He had followed Dr. Jordan to the University of Indiana, where he became instructor and later professor in zoology. With the exception of four years as professor at the University of Cincinnati, he was continuously associated with Dr. Jordan, from 1877 to 1928, in Butler University, Indiana University and Stanford University, where he became emeritus professor in 1925.

In 1877, Dr. Gilbert had joined Dr. Jordan in a fish survey of the state of Georgia, a line of research not attempted before. In 1879 he was appointed by Professor Baird as secretary to Dr. Jordan's exploration of the fish fauna of the Pacific Coast, a research occupying most of 1880, and which Gilbert extended to Mazatlán and Panama. For many years the papers of "Jordan and Gilbert" were the most prolific in American ichthyology, their most extended paper being a descriptive "Synopsis of the Fishes of North America" in 1882.

From 1880 to 1928 Dr. Gilbert retained connection with the Fish Commission (later the Bureau of Fisheries). Since the first serious study of the Pacific salmon, by Jordan and Gilbert in 1880, he devoted his scientific work to the five American species of these fishes, until he came to know more of their character and habits than all other men taken together. The demonstration that their individual ages are recorded in their scales is largely his work, though others have made fruitful efforts at the same problem. The clue to his conclusions rests in the fact that in migratory fishes, the rings of growth recorded in the scales are larger and more wide-set during their well-fed life in the sea.

In nearly all the expeditions of Dr. Jordan to various parts of the world, Dr. Gilbert took an active part, as well as conducting others to Alaska, Hawaii, Japan and Panama. The ascent of the Matterhorn in 1881, with Dr. Jordan, Dr. M. B. Anderson and three students, was made at Dr. Gilbert's suggestion. In this adventure he was struck in the face by the fall of a great rock. This kept him, with Jordan, W. W. Spangler and two guides, one the famous Jean Baptiste ("John the Baptist") Aymonod, near the summit all night. His steel-rimmed Derby hat and careful ministrations by his comrades saved his life.

In 1909 Dr. Gilbert assisted the International Fisheries Commission in its salmon investigations, and for the last five summers he devoted himself almost wholly to salmon problems in Alaska.

In 1882 Gilbert was married to a fellow student, Julia Hughes, also interested in zoology and a member of the Matterhorn party. She died in November, 1915. During her life in Palo Alto she was a notable leader in favor of civic betterment. He left three children—Carl Gilbert, an attorney in Santa Fe; Ruth (Mrs. Percy B. Baker), of Atlanta, and Winifred (Mrs. Carl F. Braun), of Pasadena. All these are graduates of Stanford University.

Dr. Gilbert, one of the pioneers of the Stanford faculty, was a man of versatile genius. He had talent as musician and linguist, though his writings and lectures he confined rigidly to aspects of his chosen

specialty. He was one of the most careful and accurate of scientific observers, the keenest and ablest critic in natural history I have ever known, and therefore a most helpful teacher. His attitude was wholly modern, though he had little interest in those writers who, as specialists building on fact, add wide deductions as to what may be, and assuming that all these are sound, frame far-reaching theories of consequences of evolution. Results attained too easily, by analogy and imagination, may be more discouraging to actual workers than ever the most rampant of systematized ignorance.

Dr. Gilbert was a man of rather less than average stature, but agile and wiry. In the words of "John the Baptist," "C'est un homme fort et brave" (a man strong and brave)

DAVID STARR JORDAN

SCIENTIFIC EVENTS

THE INTERNATIONAL DAIRY CONGRESS

THE eighth International Dairy Congress, to be held in Great Britain from June 26 to July 12, will be attended by 30 official delegates from the United States. In addition, a large number of unofficial delegates is expected to attend. The delegation sailed on June 16 on the *Leviathan*.

The seventh congress was held in the United States in October, 1923.

The congress will meet with London as headquarters, but excursions, tours and inspection trips will carry the delegates to practically all points in England. Receptions and numerous conferences for the reading of special papers and studies have a prominent place in the program.

The delegates named by President Coolidge to represent the United States are:

R. W. Dunlap, assistant secretary of agriculture, Washington, D. C.

Dr. L. A. Rogers, acting chief, Bureau of Dairy Industry, Department of Agriculture.

Roy C. Potts, chief, dairy marketing division, Department of Agriculture.

Dr. G. E. Sherwood, dairy farmer, Kimball, Minn.

A. J. Glover, editor, *Hoard's Dairyman*, Fort Atkinson, Wis.

J. D. Mickle, state food and dairy commissioner, Portland, Ore.

Professor J. B. Fitch, Kansas State Agricultural College, Manhattan, Kans.

A. M. Loomis, American Dairy Federation, Washington, D. C.

P. H. Kasper, cheese manufacturer, Bear Creek, Wis.

Professor A. A. Borland, Pennsylvania State College, State College, Pa.

Professor O. E. Reed, Michigan Agricultural College, East Lansing, Mich.

Dr. C. W. Larson, director, National Dairy Council, Chicago, Ill.

Dr. H. E. Van Norman, American Dry Milk Institute, Chicago, Ill.

D. M. Dorman, president, the California Dairies, Los Angeles, Calif.

A. L. Haecker, president, Allied State Creamery Association, Lincoln, Nebr.

Harry Bull, secretary, Dairymen's League, Orange County, New York.

Judge J. D. Miller, president, National Cooperative Milk Producers' Federation, New York City.

E. T. Rector, president, Fairmount Creamery Company, Omaha, Nebr.

W. J. Schilling, president, Twin City Milk Producers' Association, St. Paul, Minn.

Fred Rasmussen, secretary, International Association of Ice Cream Mfrs., Harrisburg, Pa.

E. M. Bailey, president, American Dairy Federation, Pittsburgh, Pa.

Dr. Robert S. Breed, bacteriologist, Agricultural Experiment Station, Geneva, N. Y.

T. H. McInnerney, president, National Dairy Products Corporation, New York, N. Y.

Dr. E. B. Meigs, Bureau of Dairy Industry, Department of Agriculture, Washington, D. C.

Frank S. Harmon, director of the Ohio Guernsey Breeders' Association, Cleveland, Ohio.

H. W. Jeffers, Walker-Gordon Laboratory Company, Plainsboro, N. J.

O. S. Jordan, president, Dairy and Ice Cream Machinery and Supplies Assn., New York City.

John Rundall, De Laval Separator Co., Chicago.

Professor George B. Caine, Utah Agricultural College, Logan, Utah.

Professor O. F. Hunziker, Blue Valley Creamery Company, Chicago.

THE UPPER KLAMATH WILD-LIFE REFUGE

BY executive order President Coolidge recently set aside for use as a refuge and breeding ground for birds and wild animals an area in southern Oregon embracing certain unappropriated public lands near the upper end of Upper Klamath Lake. The new reservation will be known as the Upper Klamath Wild Life Refuge and will be administered by the U. S. Bureau of Biological Survey. All the lands involved have been withdrawn for reclamation purposes in connection with the Klamath irrigation project in Oregon and California and, as with other reclamation projects set aside as wild-life refuges, are primarily under the jurisdiction of the Bureau of Reclamation of the Department of the Interior. The reservation of these lands as a bird refuge, therefore, is subject to use by the Bureau of Reclamation for irrigation and other purposes. A federal announcement says: