Of these ten, four—namely, the second, third, fourth and tenth—have to do primarily with the interferometer or its application to various sensitive measurements. It was in measurements relating to the interference of light and speed of light that he was by far the greatest expert that the world has yet seen. He spent his scientific life largely in these two fields. He was not an omnivorous reader of the literature of physics, and did not try to follow closely the developments of the theoretical fields of electronics and quantum theory. He was essentially a classical physicist, but any one who ever heard him conduct a Ph.D. examination in physics, and any one who ever attended his lectures or heard him speak knows that his grasp of classical physics was penetrating and precise. His lectures and his papers were masterpieces of elegance and conciseness. He used few words, but they were just the ones he wanted. Indeed, the precision of his mind was its dominating characteristic, which showed even in his sports. I have played tennis with him all my life, and his calling of balls, for example, was never generous either to himself or to his opponent. It was simply exact and just. Closely allied to this characteristic was his altogether extraordinary honesty. Pretense of any kind was utterly foreign to his make-up. Indeed, he was one of those very rare persons who would not even tolerate fooling himself with respect to his own motives, as so many of us do. If his conduct was ever ungenerous he knew it and frankly admitted it, whether he thought it wise to change it or not. Before I became intimately associated with him I had heard that he was considered by his pupils to be somewhat unapproachable, occasionally arbitrary, and at times dictatorial, if not unreasonable, but in the twenty-five years in which we worked together I could not have been treated with greater courtesy and consideration, even in the few cases in which we differed in judgment. His dignity and courtesy of bearing were altogether striking characteristics, and as the years passed he grew to be a man of great mellowness, kindness and affability.

Like many a scientist, Mr. Michelson was also an artist, with a keen feeling for form and color, as well as for music. He painted well, played the violin well, and did well at tennis, chess and billiards.

American science and the American nation have lost in his death one of their finest and greatest figures.

ROBERT A. MILLIKAN

MAY 11, 1931

VERANUS ALVA MOORE—PIERRE AUGUSTINE FISH

BOTH these men were natives of New York State—Dr. Moore, of the western border in the Lake Ontario basin, and Dr. Fish of the eastern portion in the Hudson River Valley. Both received their early education in the schools and academies of the state, and both were graduates of Cornell University.

Both were called as heads of departments in the original faculty of the New York State Veterinary College at Cornell, and finally both became deans of the college, Dr. Moore succeeding Dr. James Law in 1908, and Dr. Fish succeeding Dr. Moore in 1929. Their friendship, mutual help and confidence in each other continued without a break till the end of life. Both, as if of one spirit, served their country in the World War.

Veranus Alva Moore was born at Houndsfield, Jefferson County, New York, April 13, 1859, and died at Ithaca, New York, on February 11, 1931. His parents were Alva and Antoinette Eastman Moore.

The Moore family, as was common in pioneer days, had mainly the wealth of strong hands and independent character. The father died when the boy was but thirteen years old, thus compelling him to assume the duties of a man very early in life. Young Moore had the manly qualities, and went out to work on a farm to support himself and to help the mother and children. In this farm labor he had the misfortune to step on a nail, which penetrated his foot and set up an infection in the bones which caused him much suffering for the next ten years.

This accident compelled him to come in contact with physicians to obtain relief, and he finally became a patient in Bellevue Hospital, New York. There he saw hospital management and ate the hospital food of the time. He also saw and was operated upon by the famous surgeons of the period, and saw all too often the infections which followed operations. Knowledge of the rôle played by bacteria in infections was known and appreciated by very few, and the pioneer work of Lister in applying to surgery the knowledge of micro-organisms which Pasteur had made known was then not deemed worthy of serious consideration in the minds of most of the medical men.

This contact with physicians and hospitals was destined to have a great influence on Moore's life and to determine later its trend. Meanwhile he made great progress in fundamental education, taught district school, and made a success of it in spite of the crutches he had to use. Never satisfied with present attainments, he passed from the district schools to Mexico Academy, in Oswego County. There he came under the stimulating influence of one of the fine principals (James Gifford) found everywhere as heads in the academies (really junior colleges) of those days. He graduated from the academy in the spring of 1883, and in the fall of that year entered Cornell University, and graduated with his class in 1887.

In the spring of 1887 he had completed the required work for graduation, and was recommended and accepted as assistant with Drs. D. E. Salmon and Theobald Smith in the U. S. Bureau of Animal Industry at Washington.

At this time epoch-making changes were taking place. Meat inspection was being introduced at the great abattoirs, researches were going on to determine the cause and prevention of hog cholera and the Texas fever of cattle. He remained in the bureau for nine years, advancing step by step, until in 1895, when Dr. Theobald Smith went to Harvard, Dr. Moore was made chief of the division of animal pathology. This Washington experience gave him an intimate knowledge of the problems confronting the live-stock interests of the whole country. It also brought him in contact with the leading men of the country both in human and in veterinary medicine.

On the establishment of the New York State Veterinary College in 1896, Dr. Moore was invited to the chair of bacteriology, pathology and meat inspection. Here was carried on the main part of his life work. With his broad experience in the government service, and under the influence of the high ideals of Dr. Law, dean of the college, Dr. Moore entered enthusiastically into the building up of this enterprise. There appeared before him two great goals to attain: To make the preliminary education of students more adequate, and to so teach and train the men in his subjects that they would be on a par with the men in the great profession of human medicine. He knew also the need for and the desire for knowledge of the laws of health, and the ways to avoid such infections as he had suffered from, by the public in general. He therefore gave not only to his students, but in public addresses, in written articles and in his books the information needed by students, the veterinary profession, the stock owners of the country and the general public.

In his thirty-three years of service, he saw the preliminary educational requirements advanced to a full high-school course, and the professional training to four years, as with human medicine. Twenty-one of these thirty-three years of service, he was dean of the college and therefore in a position to bring about more effectively the changes and advances which he saw were needed. He saw the college grow both in students and faculty, and also in financial support. Besides being a great administrator he was a great teacher, and when the alumni went forth into the world, he still had a great interest in them and sent a Christmas letter to each one. In this letter were notes concerning the university as a whole, and of the college in particular, also notes concerning the faculty and the alumni. The alumni were made to feel that the college was to them a real *alma mater,* and welcomed them whenever they returned.

One of the last services which Dean Moore rendered the college was a 47-page pamphlet giving the history of the veterinary work of the university from its beginning, with Dr. James Law as its exponent, until his own retirement in 1929. This history fills one with renewed courage, for it shows how intelligence and devoted service can make advances.

On retiring from the Veterinary College at the age of seventy, Dr. Moore had planned to devote his remaining years to a quiet life of research, and especially to the preparation of a history of veterinary medicine in America. But that was not to be.

From his twelve years on the Ithaca Board of Health, twelve years on the school board, and as trustee of the Ithaca Memorial Hospital and on its medical staff for a long period, he seemed by this training, and his knowledge of the best practice in present-day hospitals, and also the defects of early-day hospitals, and his tried administrative skill, to be just the right person to straighten out the difficulties into which the hospital had become involved with its ever-growing financial deficit and the lack of team work in the staff. Here was a call for help, and to help had been his greatest aim in life. So he put aside the plans for repose and became head of the hospital. Besides his knowledge, he brought to this task that precious faith in human nature which makes all roads straight, and commands everywhere loyalty and devotion to ideals.

All his constructive work and plans were making notable progress when he himself came to need the ministrations of the hospital. There on the morning of February 11, 1931, he passed from the sleep in life to the final sleep in death.

Dr. Moore had a most hospitable home. There were two sons and a daughter, and there came also grandchildren to bring happiness in his advancing years.

In the community, and among the students, the faculty, his scientific and professional friends he was regarded with both respect and affection.

Pierre Augustine Fish was born at Chatham, Columbia County, N. Y., February 17, 1865, and died at his home in Ithaca, New York, on February 19, 1931. His parents were Irvin A. and Margaret Shufelt Fish.

The father was a furniture dealer in the village, and the young man aided in the care of the store when not in school. Besides the village schools he attended the South Berkshire Institute, New Marlboro, Massachusetts, and Hartwick Seminary, near Cooperstown, New York. He entered Cornell University and

graduated with the degree of B.S. in natural history in 1890, and doctor of science in 1894. From 1890 to 1895 he was instructor in vertebrate zoology and neurology in Cornell, and during the summer, from 1891 to 1895, he was instructor in the Woods Hole Marine Biological Laboratory.

Under the inspiring influence of Burt G. Wilder, he became greatly interested in the central nervous system, and fifteen of his earlier papers were upon that subject. His three-dimensional models of small brains, made easily possible by the Born wax-plate reconstruction method, were the first to be made in Cornell. He also applied the Golgi-Cajal silver staining method for elucidating the fine structure, and was very successful with both methods, as may be seen by consulting his paper on the small salamander, Desmognathus, in Vol. X (1895) of the *Journal of Morphology*.

In 1895 Dr. Fish had the opportunity of joining the staff of the Bureau of Animal Industry, and in that year had impressed upon him the tremendous problems involved in the animal husbandry of the country.

On the opening of the Veterinary College at Cornell University in 1896, he, like Dr. Moore, was called as a member of the original faculty. His department was physiology and pharmacology. He threw himself heart and soul into the work. He found the students sadly lacking in preliminary education, and from the beginning worked with Dr. Law and the rest of his colleagues to increase the entrance educational standard, so that the lecture and laboratory work in his subjects might be understood and made so thorough that the alumni would be ready to meet the actual experiences of life in practice with credit to themselves. During the thirty-five years of service to the college he gave class-room instruction to every student who graduated. No one can overestimate the influence of such a teacher upon the minds of these young people whose habits of thinking and study were being formed. He planted in those receptive minds a sense of responsibility, and seriousness, and an appreciation of the sciences on which their life work was based. It was well expressed by one who has since gained distinction: "I look back with gratitude to Dr. Fish for the insight he gave me into the dignity of science, and the way scientific knowledge is gained." Dr. Fish had also great influence for good to the students in his service as secretary of the faculty for twenty-nine years.

He was editor of *The Cornell Veterinarian* for its first five volumes, 1911 to 1916, and of the *Journal* of the American Veterinary-Medical Association from 1915 to 1918. In this editorial field he was especially effective; with a fine literary sense, he put in cogent form the needs and opportunities of the veterinary profession. In his discussions there was fairness and tolerance, but still an insistence on the highest ethical standards.

Dr. Fish was a fellow of the American Association for the Advancement of Science, and of course of the State and National Veterinary Societies.

His numerous writings, including several books, pertain mostly to the physiology of the domestic animals and their relation to human beings. Some of these striking papers deal with veterinary education, and the need of a general fundamental education before entering upon the professional studies.

The keenness of his mind and his comprehension of the requirements for true scientific investigation was impressed on the writer during a joint research extending over three years after he left the U. S. Army service at the end of the world war. Dr. Fish exemplified the ideal researcher. To find the truth was the goal, and no labor was too great to attain that end. He spurned the easy way to cover up ignorance by plausible guesses.

In 1929 when Dr. Moore retired at the age of seventy, he was chosen by the university administration to become dean of the Veterinary College. Dr. Fish was perfectly familiar with the administrative details of the college and shared the ideals of his predecessors; naturally, therefore, it continued its forward march under his wise and considerate leadership.

The students, the faculty and the alumni gave most loyal support, and Dr. Moore in public addresses and in private used his large influence most generously in support of his successor.

A severe cold contracted on a journey to and from Schenectady to give a broadcast on the rise and progress of the veterinary profession in America finally terminated in pneumonia and ended his life, February 19, 1931, eight days after his predecessor and friend, Dr. Moore, had passed away.

Dr. Fish preferred the quiet life of teaching and research to more public activities, but when public duties confronted him he accepted them, and carried them through so finely that every one approved and was satisfied. He was greatly sought for as toastmaster. Every one felt confident that if he presided there would not be a dull moment in the program. His own elegant and witty expressions set the pace and kept the events moving without a hitch.

Dr. Fish's home, with his five children, four daughters and a son, offered a warm welcome to students, colleagues and friends. He was a good neighbor, a good citizen, not only of his own community but of the whole state and nation, and was trusted and honored by all.

The writer would like to express gratitude for the

privilege of teaching these men, for seeing them develop and become beneficent forces in the progress of our country, for having them as colleagues in university work and for their lasting friendship. It was hoped that they might say a kindly word for their old teacher instead of the duty falling upon him to speak for them.

SIMON HENRY GAGE

MEMORIALS

MEMORIAL services for Professor Albert A. Michelson were held on the afternoon of May 18 in Joseph Bond Memorial Chapel of the University of Chicago. Dr. Max Mason, president of the Rockefeller Foundation, spoke on "Professor Michelson as a Scientist." Dr. Mason was for five years president of the University of Chicago, and was previously professor of mathematical physics at the University of Wisconsin. Dr. Henry Gordon Gale, dean of the physical sciences division, who collaborated with Professor Michelson in the study of earth tides, spoke on "Professor Michelson as a man." Dr. Robert Maynard Hutchins, president of the university, spoke on "Professor Michelson's Service to the University of Chicago."

BRONZE busts of four Americans were unveiled on May 14 at the Hall of Fame of New York University: James Monroe, fifth president; Matthew Fontaine Maury, oceanographer; Walt Whitman, poet, and James Abbott McNeill Whistler, artist. The bust of Maury is the work of F. William Sievers, of Richmond, Va., who made the Maury monument in that city. The gift of the United States Daughters of the Confederacy, it was unveiled by Matthew Fontaine Maury, 3rd, great-grandson. Professor S. A. Mitchell, director of the Leander McCormick Observatory of the University of Virginia, and Rear Admiral Walter R. Gherardi, hydrographer of the Bureau of Navigation, spoke in tribute to Maury.

RECENT DEATHS

DR. SAMUEL WILSON PARR, professor emeritus of practical chemistry in the University of Illinois, died on May 16. He was seventy-four years old.

DR. HENRY J. PRENTISS, head of the department of anatomy in the University of Iowa, died on May 17, aged sixty-three years.

Nature announces the following deaths: Dr. J. Anderson, formerly fellow of the London School of Tropical Medicine, later professor of medicine in the University of Hong-kong and recently director of the division of medicine in the Henry Lister Institute at Shanghai, aged fifty-two years; of Professor R. K. Butchart, professor of mathematics in Raffles College, Singapore, and formerly professor of physics in Wilson College, Bombay, on March 30. Senator R. Nasini, professor of chemistry in the University of Pisa, on March 29, aged seventy-five years. Professor Hugh Ryan, professor of chemistry in the University College of Dublin and chief state chemist to the Irish Free State, on March 27, aged fifty-seven years. Mr. T. C. Cantrill, formerly of the Geological Survey of Great Britain, on April 3, aged sixty-three years, and of Sir John de Villiers, noted especially for his work while in charge of the map room at the British Museum and his contributions to geographical and historical literature, on April 2, aged sixty-seven years.

SCIENTIFIC EVENTS

THE LAKESIDE HOSPITAL IN CLEVELAND

THE dedication of the new Lakeside Hospital of the medical center of Western University will take place on June 17. The hospital completes the development of the medical school at the university, which has been made possible by gifts amounting in all to $15,000,000. The buildings include the Schools of Medicine, Nursing, Pharmacy and Dentistry; the Institute of Pathology, Babies and Children, Maternity and Rainbow Hospitals; the Medical Library, the Nurses' Dormitory and the Robb and the Hanna Houses, the latter a private patients' pavilion.

Dr. Hans Zinsser, professor of bacteriology at Harvard University, will make the principal address at the dedication ceremonies. Mr. Samuel Mather, president of Lakeside Hospital for more than thirty years, will preside. Mr. Mather built the School of Medicine and has been the largest single contributor in the development known to the public as the "Cleveland Medical Center." President Robert E. Vinson, of Western Reserve University, will confer honorary degrees.

The dedication will take place in the morning and will be followed by a luncheon under the auspices of the Lakeside Alumni Association in Robb House. In the afternoon are scheduled a scientific session, an inspection of Lakeside Hospital and a visit to the Institute of Pathology. The evening will be occupied with the dinner of the Lakeside Alumni Association.

THE NEW ORLEANS CHAPTER OF THE PAN AMERICAN MEDICAL ASSOCIATION

AT the call of Dr. Arthur Vidrine and Dr. Rigney D'Aunoy, a number of prominent New Orleans physicians met recently in the library of the Charity