difficult to enumerate all the major and minor undertakings launched in this field and which are already yielding results, even if it were possible to talk about them now.

It is interesting to note that there is not a single field of scientific thought that can not be of value in modern warfare. There is no specialty whose representatives can not put their attainments at their country's service. Physiologists are confronted with such new problems as improving the sight of observers and studying the effects of certain diets and drugs. A peaceful study such as the deciphering of cuneiform inscriptions proved to be of service when it was shown in the last war that experts in cuneiform and hieroglyphic writing were best equipped to decode secret enemy ciphers. Our botanists are working out rules for camouflage, taking account of seasonal changes in vegetation. Our historians are successfully helping fight the unprincipled pseudo-scientific propaganda of the fascists.

The struggle now being waged is giving an exceptional stimulus to scientific thought. The strain and tension caused by war are exposing the weak spots in our economy, technique and organization, showing the points where the state must first of all be assisted, and clearly formulating the demands which society makes on science. Although the war demands great sacrifice and causes much devastation, the upsurge of scientific work which is taking place in our country, and which must develop still more, will not lose its value after the war. The new war-revealed possibilities for unified development of our technique and economy will continue evident in the post-war period as well. History proves that this is true.

It is generally known, for instance, that when the Continental blockade cut France off from the colonies which had supplied it with cane sugar, Napoleon ordered his scientists to search for new sugar sources. Systematic work by French scientists led to the discovery of the method for extracting sugar from sugar beets, now the most widely used method. During the war of 1914–18, the process of nitrogen fixation was introduced and used on a large scale in Germany, which had suffered an acute nitrate shortage. The inventor Haber had not been able to find an industrial application for his discovery before the war. Germany was saved from speedy defeat and, after the war, the synthesis of ammonia spread throughout the world, serving as a basis for obtaining one of the best agricultural fertilizers.

In the course of the present war a number of similar achievements may undoubtedly be expected. For obvious reasons it is impossible to indulge in concrete discussion of the scientific work being carried on in the Soviet Union at the present time. It is already clear, however, that the war will lead to further improvement of our air fleet, will make for better motors, will teach us to achieve high productivity in industry with less workers, and will bring our theoretical, creative thought closer to the practical needs of the country. The sum total of the achievements of our Soviet land will have a tremendous bearing on the development of scientific thought serving world civilization.

OBITUARY

FRANK SMITH

1857–1942

FRANK SMITH, professor emeritus of zoology at the University of Illinois, died at St. Petersburg, Florida, on February 3, 1942, at the age of eighty-five years. He was born at Winneconne, Wisconsin, on February 18, 1857, son of Samuel Franklin and Aurelia Shepard Smith. The parents were of English origin, their ancestors having come to New England at a very early date. When the boy was two years of age his parents moved to New England. His early education was secured in public and private schools of Trenton, New Jersey. In 1870 the family returned to Wisconsin, and until the age of eighteen he attended the Winneconne village school. A marked mathematical turn of mind manifested itself at a very early age. At the age of twenty-one he began earning money to finance a college education. During the years 1879–1885 he was a student, first, in the preparatory department and, later, in the college department of Hillsdale College, Hillsdale, Michigan, receiving the Ph.B. degree in 1885, also the graduating prize in mathematics. While a student in this college he taught mathematics in the preparatory department during the years 1882–1886. A part of the summer of 1886 and the summer of 1887 were spent at the Marine Biological Station at Annisquam, Massachusetts, and the summer of 1891 at the Marine Laboratory of Alexander Agassiz at Newport, Rhode Island.

Following graduation he was appointed professor of chemistry and biology at Hillsdale College, occupying this position during the period 1886–1892. On September 8, 1887, he was married to Edith M. Fox, who died on November 15, 1888. One child, Donald Fisk Smith (1888–1905), was born to them. On July 12, 1890, he was married to Isadora Stamats, who survives him.

Finding his interest in biology growing and feeling the need of further training he did graduate work at Harvard University for a part of the years 1891 and

1893, receiving the degree of A.M. in 1893. In 1892 he was made instructor in biology at Trinity College, Hartford, Connecticut. The next year he was called to the University of Illinois as instructor in zoology. In 1896 he was made assistant professor; associate professor in 1906, and professor in 1913. During the period 1900–1917, he was also curator of the University Museum of Natural History. He taught in summer sessions of biological stations as follows: University of Illinois, 1898 and 1910; University of Michigan, 1911–1914 and 1919–1922; University of Colorado, 1916. The honorary degree of D.Sc. was conferred upon him in June, 1923, by Hillsdale College. In accordance with the University of Illinois retirement plan he became professor emeritus in 1926. He then returned to Hillsdale, Michigan, to live, although all but three of the subsequent winters were spent at St. Petersburg, Florida.

Professor Smith's career as a zoologist began when biology in America was still in its pioneer stage and he lived through that phenomenal period of growth of the science which led to its present maturity. It was a period of rapid change in materials and methods of teaching, scientific techniques and fields of research. To hear him give a connected account of this evolution of biology in America was a unique and informative experience.

The first serious research was begun at Harvard University under the guidance of E. L. Mark and resulted in a paper on the gastrulation of *Aurelia flavidula* (1891, *Bull. Mus. Comp. Zool.*). Events occurred shortly thereafter which changed markedly the character of his investigations. He was invited to become a member of a field party maintained, during the summer of 1893, by the Michigan Fish Commission to carry on a biological investigation of Lake St. Clair. This work marked the beginning of his permanent interests in the problems of inland waters. These interests became further crystallized when in the autumn of the same year S. A. Forbes induced him to go to the University of Illinois on a joint appointment between the Department of Zoology and the Illinois State Laboratory of Natural History. In the spring of 1894 he was made director of the newly organized Biological Station on the Illinois River, an institution jointly supported by the university and the state laboratory for the purpose of making faunistic studies in which special attention was given to the problems of the fisheries. It soon became evident that annelid worms were an important element in the fauna, but since little was known about them in North America, he began investigations on the Oligochaeta and thus his major field of research was initiated. In it he came to be the leading authority in America. His many contributions form the bulk of what is now known of the taxonomy, morphology, distribution and biological relations of the higher Oligochaeta of this continent.

Professor Smith also found other outlets for his diversified zoological interests. About 1915 he began researches on fresh-water sponges, publishing several valuable papers and building up an extensive collection. During a period of twenty years, beginning with 1903, he carried on investigations on the birds of eastern Illinois, with special attention to the relation of spring migration to weather conditions. Several papers were published in this field. Certain other research interests yielded publications, namely, structure of the sacrum and first haemal arch of *Necturus*, hydroids in the Illinois River, relation of fish to oxygen distribution and fresh-water medusae. In addition, there were other writings, such as the well-known chapters on fresh-water Hydrozoa and aquatic Oligochaeta in Ward and Whipple's "Fresh-water Biology."

One of the outstanding characteristics of Professor Smith as an investigator was his meticulous care in the testing of data, his rigorous scrutiny of literature and his insistence that research papers be composed with the utmost regard for accuracy, clarity and brevity. Another characteristic was his unflagging interest in research, manifesting itself in the steady flow of contributions throughout his professional career. Time gaps of any consequential size between contributions are lacking, even during that earlier period when he was afflicted with a serious impairment of eyesight.

As a teacher he was unusually stimulating in an individualistic way which was a part of his personality. Of particular strength was his organization and conduct of field work as a part of courses of instruction. It was his work which early effected an intimate association of the teaching program at the university and researches of the various scientific agencies of the state. He was also responsible for the early appreciation of the value of a museum in the university for teaching purposes rather than for popular exhibition.

As a member of the faculty, he served his university in many important ways. He was entrusted with university responsibilities which called for clear insight and sound judgment. Among his various services to other institutions, he acted for many years as consulting specialist to the U. S. National Museum and to the U. S. Department of Agriculture.

After retirement he found, much to his regret, that conservation of strength and lack of technical facilities necessitated abandonment of research on Oligochaeta. He then turned to his ornithological interests and entered upon an active program of bird banding. This activity, together with a deep interest in the development of the arboretum of Hillsdale College, was a constant source of interest and satisfaction. During the winter months in Florida, he became absorbed

in the intriguing ornithology of that state and was active in ornithological organizations at St. Petersburg. For ten years prior to his death he was a member of the board of trustees of Hillsdale College.

Professor Smith's personality was one in which unusual modesty, kindly reserve, deep sincerity and rigid honesty were outstanding features. His code of honorable living was the highest and never deviated. New acquaintances and friendships were acquired slowly and discriminatingly. He had scant patience with the thoughtless, frivolous and superficial, although he possessed a large portion of charity and never refused aid or a courteous hearing to those who approached him for assistance. His attitude towards friends and acquaintances was always charitable and kindly. For careless scientific work he had a supreme contempt and was not reluctant to condemn it in terms which it deserved. At times the undergraduate student stood much in awe of him, but his graduate students, in their more intimate relations, found in him a keen sense of humor, a warm friendliness and a generous sympathy. Those who enjoyed the privilege of the close contacts of a personal friendship had an opportunity to see the real meaning of superior personal honor and integrity.

PAUL S. WELCH

UNIVERSITY OF MICHIGAN

DEATHS AND MEMORIALS

DR. RAYMOND DODGE, professor emeritus of psychology at Yale University, died on April 8, at the age of seventy-one years.

DR. LORRAIN S. HULBURT, emeritus professor of collegiate mathematics at the Johns Hopkins University, died on March 29, at the age of eighty-four years.

DR. WILLIAM WEIDMAN LANDIS, for forty-seven years professor of mathematics at Dickinson College, died on April 8 at the age of seventy-three years.

DR. SUSAN R. BENEDICT, professor emeritus of mathematics at Smith College, who was a member of the faculty for thirty-six years, died on April 8. She was sixty-eight years old.

DR. HARRY A. CARPENTER, specialist in science in the schools of Rochester, N. Y., died on April 5, at the age of sixty-four years.

EDGAR W. TIMM, research assistant in genetics at the Iowa State College, died suddenly on March 26. He had been a Rhodes Scholar at the University of Oxford for three years, 1936–39, before returning to Iowa State, where he worked on bacterio-genetics. He was twenty-six years old.

A BUST of the late Henry Fairfield Osborn, president of the American Museum of Natural History, New York City, was unveiled in the Roosevelt Memorial Building on April 8. Addresses were given by Dr. William K. Gregory, professor of vertebrate paleontology at Columbia University and curator at the American Museum, who for many years cooperated with Dr. Osborn in his scientific work, and by Dr. James Rowland Angell, president emeritus of Yale University, educational director of the National Broadcasting Company.

SCIENTIFIC EVENTS

CHEMICAL WARFARE COURSE

TWENTY-FIVE physicians from the First, Second and Third Defense Regions attended a special course on "Medical Aspects of Chemical Warfare Agents" at the University of Cincinnati College of Medicine, from February 23 to 26, inclusive, under the auspices of the Medical Division of the Office of Civilian Defense with the cooperation of the Chemical Warfare Service of the U. S. Army. It is expected that the class will be repeated for physicians of other regions in the coming months.

Dr. Leon Goldman, assistant professor of dermatology and syphilology in the college of medicine and attending dermatologist at Cincinnati General Hospital, is in charge of the course. The faculty and the subjects given in the first course are as follows:

Milan A. Logan, Andrew Carnegie professor of physiological chemistry and head of the department: Review of Some of the Pertinent Data of the Chemistry of the Chemical Warfare Agents, and Medical Aspects of Some of the Systemic Poisons.

Dr. Robert A. Kehoe, research professor of physiology in the college and director of the Kettering Laboratory of Applied Physiology: Pathologic Physiology and Symptomatology of the Pulmonary Irritants, and Medical Aspects of some of the Systemic Poisons.

Dr. Marion A. Blankenhorn, Gordon and Helen Hughes Taylor professor of medicine: Therapy of Pulmonary Irritant Cases.

Dr. Willard Machle, research associate in applied physiology in the college and assistant director of the Kettering Laboratory: Individual Protection.

Dr. Albert L. Brown, assistant professor of ophthalmology: Eye Injuries from Chemical Warfare Agents.

Dr. Mont R. Reid, Christian R. Holmes professor of surgery: Treatment of Burns from Incendiaries and Other Materials.

Dr. James H. Bennett, assistant professor of surgery in anesthesia: Anesthesia for Chemical Warfare Casualties.

Dr. I. Arthur Mirsky, assistant professor of biological chemistry at the college and director of the May Institute of Medical Research at the Jewish Hospital: Medical and Chemical Aspects of Collective Protection.