tion in the same manner and general field as any privately owned and ethically operated business, they pay no dividends to personal stockholders. All income above expenses not held for reserves or needed for operating capital is expended currently to aid scientific and educational institutions in the prosecution of research.

Briefly, these two corporations may be said to hold a place and typify a new class midway between such privately endowed research and welfare foundations as Carnegie, Russell Sage, Rosenwald, and the like on the one side, and university research foundations, such as those at Wisconsin, Purdue and, more recently established, Ohio State on the other. They differ from the first category in starting with no large monetary endowment, that interest or dividends on securities purchased as investment are not intended ever to be a significant factor in their income, but that normally they earn their way currently through services in invention development and production for use.

They differ from the university foundations on the other hand chiefly by being entirely free from commitments to any one institution and thus being able to work with any and all of them, either individually or collectively. Also as yet the university foundations appear to have been conceived and administered almost exclusively from the standpoint and hope of revenue for further scientific research in the universities than with definite intent to use them as laboratories in social economics, which latter I have particularly tried to emphasize as the outstanding opportunity and characteristic among the purposes of Research Corporation and the Associates. That is, they are frankly willing to risk or even sacrifice on occasion possible legitimate profits from the licensing or operation of patents or developments if thereby a more important public service can be rendered by demonstrating the relative value and pertinency of proposed reforms in business and social administration of such rights, monopolies or other social-economic structures as the corporation may control or operate at a given time.

It is this latter aspect of the corporations' purposes and activities that is felt to be the most nearly unique up to the present time, and these it is hoped will eventually spread to other existing or yet to be created organizations, for this appears a most promising but neglected field of social-economic endeavor and research. In fact, I feel my main justification for being here to-night is what it may mean for the stimulation of just such activity. Perhaps the most impressive lesson that 25 years' experience with Research Corporation has driven home to us is how small a part of the field any one group can or should try to cover. Decentralization of projects and variety of approach, with free and active exchange of knowledge and experience, constitute the ideal program. Each new project of course presupposes sound worth-while new ideas for its technical background and adequate leadership ready to stay with them through thick and thin, but that is just what red-blooded engineers are supposed to have.

(To be concluded)

OBITUARY

WILLIAM MORTON WHEELER

WILLIAM MORTON WHEELER, professor of entomology, emeritus, at Harvard University, died suddenly in Cambridge, on April 19, in his seventy-third year.

Professor Wheeler was born at Milwaukee, Wisconsin, on March 19, 1865. He first attended public school but later transferred to Engelmann's German Academy and graduated from the German-American Normal School, which was appended to the academy. Even as a boy he was intensely interested in natural history and haunted the old museum at the school. In 1884, an incident occurred which was to influence his whole subsequent life. This was the visit to Milwaukee of Professor H. A. Ward, of Ward's Natural Science Establishment in Rochester. Ward brought with him a collection of stuffed and skeletonized mammals, birds, etc., with the idea of having the academy museum converted into a free municipal museum. Then a boy of 19 years, Wheeler helped Professor Ward prepare the collection for exhibition and was offered, and promptly accepted, a position in the Rochester Establishment. His duties consisted of identifying, listing and arranging collections of birds, mammals, shells, echinoderms and sponges. The catalogue of shells which he then prepared is still used by conchologists. In the following spring (1865) he left Ward's and returned to Milwaukee, starting his career as a teacher. Dr. George W. Peckham, who had been making studies on spiders and on the behavior of wasps, induced him to accept a position as teacher of German and physiology in the Milwaukee High School, of which Peckham was principal. Within a very few years the Allis Lake Laboratory was established near the high school, and Professor C. O. Whitman was appointed its director. One of the assistants at the laboratory, Dr. William Patten, taught Wheeler the latest embryological technique and suggested that he investigate the embryology of insects. This resulted (1893) in the publication of Wheeler's "Contribution to Insect Embryology," now recognized as a classic.

Meanwhile, however, the Milwaukee Public Museum

had been established, and in 1887 Wheeler, at the age of twenty-two, was appointed its custodian. He held that position until 1890, when he accepted a fellowship at Clark University under C. O. Whitman. In 1892 Wheeler received his Ph.D. from Clark University, his dissertation being the embryological treatise previously mentioned. The following year (1893–94) he studied at Wurzburg, at Liege and at the Naples Zoological Station. On his return to this country he was appointed instructor in embryology at the University of Chicago, and in 1896 was advanced to assistant professor. In 1899 he went to the University of Texas as professor of zoology. It was while there that he became especially interested in ants. Four years later (1903) he was selected as curator of invertebrate zoology at the American Museum of Natural History in New York. In 1908 he came to Harvard as professor of economic entomology. From 1915 until 1929 he was dean of the Bussey Institution, a graduate school of the university for research in applied biology. In the year 1924–1925 he was exchange professor at the University of Paris, and from 1926 until his retirement in 1933 he was professor of entomology and associate curator of insects at the Museum of Comparative Zoology.

Professor Wheeler's bibliography contains 467 titles. Many of these papers are concerned with the classification, structure and behavior of ants, but a considerable number deal with problems of embryology, evolution, parasitism and the social life of insects in general. Several of these publications appeared in book form, the more notable ones being: "Ants, their Structure, Development and Behavior," "The Social Insects, their Origin and Evolution," "Foibles of Insects and Men" and "Demons of the Dust, a Study of Insect Behavior."[1]

Wheeler had served his apprenticeship as a naturalist before his formal education in zoology really began, and this was perhaps the greatest good fortune of his life. Indeed many of his friends feel, and have always felt, that the full development of his great qualities was in this way facilitated and assured. In thought and feeling he was a practitioner *and* a theorist; a specialist of the first rank, and, in the ancient sense, a philosopher; a great professor, a man of vast encyclopedic learning and the least pedantic of men; a diagnostician of genius who could instantly recognize the significant patterns in things and events, but who confirmed his conclusions by meticulous and systematic observation and study. He always had and never lost satisfaction in the pursuit of minute detail and in the accumulation of facts, so that hard work was a necessity of his being, but he could set no limits, within his wide competency, to the scope of his thought or to its sources or to its reference. All these traits, or at least their full development, he believed partly the result of his peculiar training, and he was in the habit of attributing similar things to similar experiences in other cases than his own.

Observation of the social insects in the field led Wheeler—it could not fail to lead such a man, so conditioned and so oriented—to ecology, to psychology and to sociology. He worked long and hard at insect ecology, insect behavior and insect sociology, and in so doing found a most acceptable complement to his taxonomic work. But more than this, he made of himself a learned sociologist and psychologist and a master of the comparative branches of these sciences. It was such studies especially that directed his later thinking about evolution, that made him sceptical of the sufficiency of experimental evidence against the inheritance of acquired characters, that tempered his enthusiasm for the results and theories of the geneticists as a sufficient explanation of the mechanism of evolution, and that won his sympathy, warm though qualified, for the theory of emergent evolution. These studies also chiefly determined his philosophical position, so different from that of many of those who base their position on mathematics and the physical sciences. Wheeler, like the great physicians, could not forget the inconceivable complexity of things as they are and the intricacy of the web of events, but he possessed that intuitive and imaginative understanding which is the naturalist's compensation for his lack of the clear analysis of the physicist. Wheeler's philosophical position was, accordingly, chiefly the result of a naturalist's disciplined imagination and of vast first-hand acquaintance with animals and their behavior.

He was a man of letters. Possibly the most widely read member of his university, and in this respect unique among the men of science, he was also a distinguished prose writer. Both facts were, or seemed to those who knew him, very certainly and deeply characteristic, nothing less than necessary expressions of his personality.

His reading was limited only in the intellectual sphere by a disposition to avoid the more abstract sciences and, perhaps, in matters of taste by other less important preferences. It included the literature of many languages both ancient and modern and every-

[1] Professor Wheeler was the recipient of many honors. Four universities conferred honorary degrees: Sc.D., University of Chicago (1916); Harvard University (1930); Columbia University (1933); and LL.D., University of California (1928). He received the Elliot Medal of the National Academy and the third Leidy Medal from the Philadelphia Academy of Natural Sciences (1931), and in 1934 was made an Officer in the Legion of Honor. The Royal Entomological Society of London, the Entomological Society of France and the Entomological Society of Belgium also elected him an honorary member. He also belonged to the American Academy of Arts and Sciences, the National Academy of Sciences, the American Philosophical Society and the Zoological Society of France.

thing that he thought possibly of even the smallest interest as an addition to his accumulated store of knowledge and experience. His writing was the expression of his sensitive feeling for style and of his ideal of good workmanship. At its best, for instance, in his occasional satirical pieces, like the letter from the king of the termites and in "The Dry-Rot of Academic Biology," it has a force and a polish, not to mention other qualities, that recall Voltaire.

One can appraise the contributions which an unusual man has made to the civilization of his time. It is almost impossible, however, to convey in words the personality compounded of intellectual and spiritual qualities which characterize the individual as a whole and lend him the flavor and charm that make his death an utterly irreparable loss to his friends. It is quite certain that Wheeler never thought of himself as a great man. In so many ways he was the superior of those about him and his learning and originality were so freely acknowledged that a certain amount of the conceit not uncommon in lesser men might have been excusable. To some extent his sense of humor saved him from this. Like all really great men, he was extraordinarily good company. He laughed with one and, inoffensively, at one; and he was one of the very rare individuals whose idiomatic knowledge of three or four languages was such that he could laugh with equal gusto in all of them. During his later years, he spent most of his evenings in his study in West Cedar Street where one would find him sitting at a deskful of books—with more books on chairs and on the floor and with sheets of manuscript scattered under and over them. The casual visitor was installed in an armchair and the maid sent down for a bottle and the cigars. He had always read some book that other people read later—often at his instigation. His conversation would pick up from this or from some reminiscence that might lead in almost any direction from classical literature to recent discoveries of science. It was difficult to find anything of importance that he had not read—and the scope of his reading ranged from Wilhelm Busch and Alice in Wonderland to Whitehead, who himself regarded Wheeler as one of the greatest men he had ever met. A student has written the following to Mrs. Wheeler: "In a recent lecture, Professor Whitehead characterized him as the only man he had ever known who would have been both worthy and able to sustain a conversation with Aristotle."

A highly developed specialist in his own calling, Wheeler was more completely the intellectual man of the world than any but a very few of his contemporaries in this or any other country. One never left him without having learned something, and one walked down the hill after an evening with him with ever-renewed admiration and affection—and usually with a chuckle.

The death of a great naturalist, like that of a great physician, does more than put an end to a scientific career. It destroys an accumulation and synthesis of knowledge, skill, judgment and experience that can not be transmitted and preserved, because it is as yet incommunicable. To some of Wheeler's friends and colleagues these things seemed the best part of what by devotion, industry, enthusiasm and high intelligence he had made of himself professionally, an achievement even greater than his contributions to science and never to be replaced.

His written contributions to his subject will perpetuate his scientific memory, and his less technical writings will be read with interest and amusement for a long time to come. But as a personality, Wheeler was one of the great experiences in the lives of his friends and, in this sense, he will not really die until all those who knew him well are gone.

L. J. HENDERSON
THOMAS BARBOUR
F. M. CARPENTER
HANS ZINSSER

RECENT DEATHS AND MEMORIALS

FREDERIC EUGENE IVES, distinguished for his work on photographic processes, especially on photoengraving and color photography, died on May 27 at the age of eighty-one years.

DR. L. B. WALTON, professor of biology at Kenyon College, Gambier, Ohio, died suddenly on May 15 at the age of sixty-six years.

GEORGE ROBERT MCDERMOTT, emeritus professor of structurel design at Cornell University, died on May 26 at the age of seventy-six years.

PROFESSOR LUDOLF VON KREHL, director of the Kaiser Wilhelm Institute for Medical Research, known for his work on the physiology and pathology of the circulatory system, died on May 26 at the age of seventy-six years.

DR. ALFRED ADLER, of Vienna, known for his work in psychiatry and psychology, who has been lecturing in England and in the United States, died suddenly on May 29 at the age of sixty-seven years.

A CORRESPONDENT writes: "Dr. Joseph A. Culler, emeritus professor of physics at Miami University, died on May 18 at the age of seventy-nine years. Graduating from Wooster in 1884, he received the A.M. degree two years later from the same institution and the Ph.D. in 1900. From 1903 to 1927 he was professor of physics at Miami University. Dr. Culler