
NATIONAL ACADEMY OF SCIENCES

OF THE UNITED STATES OF AMERICA
BIOGRAPHICAL MEMOIRS
VOLUME XIX—SIXTH MEMOIR

BIOGRAPHICAL MEMOIR

OF

WILLIAM MORTON WHEELER

1865—1937

BY

GEORGE HOWARD PARKER

PRESENTED TO THE ACADEMY AT THE ANNUAL MEETING, 1938



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William Morton Wheeler, son of Julius Morton Wheeler and Caroline Georgiana (Anderson) Wheeler, was born in Milwaukee, Wisconsin, March 19, 1865. Of his very early childhood little or nothing is recorded, but of his school days and early life Wheeler has left a sketch from his own pen that carries with it all the freshness and energy of youth. This sketch is contained in an article published in "Natural History" (1927) and entitled "Carl Akeley's Early Work and Environment." Akeley became one of Wheeler's early and most intimate friends and Wheeler's appreciation of him contains so much that is autobiographical that it would be difficult to do better in recording Wheeler's own youthful experiences than to cite directly from this source.

Wheeler wrote: "I was born in 1865 in Milwaukee and lived there till I was nearly nineteen. The cerevisiacal fame which that city enjoyed in those preprohibition days unfortunately quite eclipsed the fame of its temperate and highly intellectual German population and excellent school system.

"Owing to my persistently bad behavior soon after I entered the public school my father transferred me to a German academy founded by Peter Engelmann, an able pedagogue who had immigrated to the Middle West in 1848. The school had a deserved reputation for extreme severity of discipline. To have annoyed one of the burly Ph.D.'s, who acted as my instructors, as I had annoyed the demure little schoolmarm in the ward school, would probably have meant maiming for life at his hands or flaying alive by the huge Jewish director, Dr. Isidore Keller, 'curled and oiled like an Assyrian bull'.

"After completing the courses in the academy, I attended a German normal school which somehow had come to be appended to the institution. A few weeks before my father's death in January, 1884, an incident occurred which was to influence my whole subsequent life and indirectly Carl Akeley's. Prof. H. A. Ward, proprietor of Ward's Natural Science Establishment in Rochester, New York, which was not so much a museum as a museum factory, learned that there was to be an exposition in Milwaukee in the fall of 1883 and that the local German

academy, which I had attended, possessed a small museum. He decided, therefore, to bring a collection of stuffed and skeletonized mammals, birds, and reptiles, and an attractive series of marine invertebrates to the exposition, and to persuade the city fathers to purchase the lot, combine it with the academy's collection, and thus lay the foundation for a free municipal museum of natural history. I had haunted the old academy museum since childhood and knew every specimen in it. Indeed, Dr. H. Dorner, my instructor in natural science, had often permitted me to act as his assistant. Of course, I was on hand when Professor Ward's boxes arrived, and I still remember the delightful thrill with which I gazed on the entrancing specimens that seemed to have come from some other planet. I at once volunteered to spend my nights in helping Professor Ward unpack and install the specimens, and I worked as only an enthusiastic youth can work. He seems to have been duly impressed by my industry, because he offered me a job in his establishment. I was quite carried away with the prospect of passing my days among the wonderful beasts in Rochester. Not the least of Professor Ward's attainments were his uncanny insight into human nature and his grim business and scientific acumen. He offered me the princely salary of nine dollars a week, six of which were to be deducted for board and lodging in his own house.

"I entered Ward's Establishment February 7, 1884. My duties consisted in identifying, with the aid of a fair library, and listing birds and mammals. Later I was made a foreman and devoted most of my time to identifying and arranging the collections of shells, echinoderms, and sponges, and preparing catalogues and price lists of them for publication. Such is the present state of conchology that my shell-catalogue is still used by collectors. At this time Akeley entered the establishment as a budding taxidermist, and for once Professor Ward's estimate of human nature seems to have been at fault, for as Akeley informs us in *In Brightest Africa* he was given a salary of \$3.50 a week, without board and lodging. He attached himself to William Critchley, a young and enthusiastic artisan, with the voice and physique of an Italian opera tenor, who had attained the highest proficiency in the taxidermic methods of the time, but did not seem to give promise of advancing the art. In the course of a year Akeley had more than mastered all that Critchley could teach him, and was longing for wider opportunities than could be offered by an establishment, which, after all, was neither an art school nor a scientific laboratory, but a business venture. But even so, there is reason to believe that its stand-

ards of workmanship were higher than in any of the museums that had grown up in various parts of the country.

"The relations between Akeley and myself soon ripened into a warm friendship. We were nearly of the same physical age, but I was the younger and more unsettled mentally, for he had been reared by sturdy parents on a quiet farm and I had been brought up in a bustling city with a superheated atmosphere of German Kultur. He was very strong and healthy, had an inexhaustible capacity for work, a great fund of quiet humor, and a thoroughly manly disposition. He seemed to have been born with unusual taste and discrimination and an intuition which could dispense with mere book-learning. Of all the men I have known—and my profession has brought me in contact with a great many—he seems to me to have had the greatest range of innate ability. Although he later became an unusual sculptor, inventor, and explorer, he would probably have been equally successful in any other career.

"In the course of time our relations settled into those of affectionate older and younger brothers. I cannot recall that we were ever even on the verge of a quarrel, and this must have been due to Akeley's self-restraint and sympathetic tolerance, because I was often irritable and unwell in those days. Owing to the fact that we did not work in the same building, our companionship was largely limited to evenings and Sundays. As I read the diaries of 1884 and 1885 I marvel at the multiplicity of our youthful interests and occupations. I cite a few passages to illustrate how we spent some of our spare hours.

'Monday, Jan. 6, 1885.* Worked on the glossary for the shell-catalogue all day. In the evening went with Carl to hear Bob Ingersoll in his lecture "Which Way?" We were much pleased with him and his wit. The lecture cleared from my mind a host of prejudices against this man who is after all a *real he man*. Weather cold.'

'Sunday, Feb. 15, 1885. Rose late. Took a walk with Carl and then went to church (Unitarian) with him to hear Doctor Mann give a magnificent sermon on the text "Out of Egypt will I call my son." Worked on algebra and read Virgil after dinner. Then walked down West Ave. with Fritz Mueller (a former schoolmate whom I was coaching in Latin for entrance to Johns Hopkins. He was the living image of the famous physiologist Johannes Mueller and probably belonged to the same family). Tired on my return. Fritz read to me Jean Paul Friedrich Richter's "Kampaner Thal."'

*In this and other starred quotations the day of the week and the day of the month do not coincide for the year 1885; as approximations they are sufficient.

'Thursday, Feb. 26, 1885. Worked on the shell-catalogue more diligently than on previous days, but am still low-spirited. In the evening read the conclusion of the Aeneid and some of Zeller's "Deutsches Reich" with Louis Akeley (Carl's brother who was attending the University of Rochester and whom I was coaching in German). To bed at quarter of twelve.'

'Monday, March 23, 1885. Worked all day on the foetal Marsupials: kangeroos, koalas, opossums, etc. Labelled all the foetuses and pouches. In the evening walked with Fritz and on returning read with him about 100 lines of the third book of the Aeneid. The evening ended with an acrimonious dispute and I went to bed in high dudgeon.'

'Thursday, March 24, 1885.* Worked all day in Prevotel's shop, changing and labelling the alcoholic fishes. In the evening attended the meeting of the Geological Section of the Rochester Academy of Sciences. Mr. Preston read to us about a quarter of Geikie's "Primer of Geology." After the meeting walked with Mr. Shelley Crump (an amateur conchologist and prosperous grocer of Pittsford, New York, to whom I had become greatly attached). To bed at eleven.'

And this is an account of a week-end with Mr. Crump:

'Sunday, May 23, 1885.* From 10 to 12 worked with Professor Ward in the shell-house, labelling Echini—the last time I saw him (for many years). In the afternoon Mr. Crump and his friend, Doctor Dunning, called on me. I walked with them to Brighton and thence took the train to Pittsford. We read together some recent papers on Pasteur by Tyndall and others and then walked along the Erie Canal bank where I collected two species of *Valvata*.'

'Monday, May 24, 1885.* Rose late. Read some of Burrough's 'Wake Robin' before breakfast. Then conversed with Dr. Dunning on Shakespeare's 'Sonnets' (Dr. D. was blind and with the aid of his wife was preparing a volume on the sonnets). At 9.20 took the train for Rochester and went to work in the shell-house finishing the family Nassidae and part of the Volutidae.'

'Tuesday, June 23, 1885. In the morning read Bluntschli with Louis Akeley. In the afternoon went with Carl, Will Critchley, and Mr. Crump to see the tobacconist Kimball's beautiful collection of orchids. Succeeded in making a *Catasetum* discharge its pollinia! In the evening read Bluntschli again after having seen Mr. Crump off on the West Shore train. Returned much fatigued. My eyes begin to pain me.'

"Of active, industrious young men there seem to be two types. One of them accepts a given environment and is not only

satisfied with its routine and constantly recurring human contacts but prefers it to any change. These young men are apt to marry early and to become the conservative and contented *fond* of our society. Those of the other type, probably endowed with a more unstable if not more vivid imagination and with a peculiar defence reaction, or subconscious dread of being owned by people and things, soon exhaust the possibilities of their medium, like fungi that burn out their substratum, and become dissatisfied and restless till they can implant themselves in fresh conditions of growth. Akeley and I were of this latter type, and by the spring of 1885 had decided to leave the establishment at the earliest opportunity. I departed June 29 and returned to Milwaukee.

"Soon after my return to Milwaukee my old friend, Dr. George W. Peckham, who had long been making important contributions to arachnology and was beginning his well-known studies on the behavior of the solitary and social wasps, persuaded me to take a position as teacher of German and physiology in the high school of which he was principal. Peckham was a very learned and charming man, deeply steeped in the evolutionary literature of the time and keenly alive to the possibilities of the new morphology that had been inaugurated by Huxley in England and a host of remarkable investigators in the laboratories of the German universities. Every year he most conscientiously read, as a devout priest might read his breviary, Darwin's *Origin* and *Animals and Plants under Domestication*. We became very intimate, and I find from my diaries that for some years I regularly spent my Sunday mornings in his house drawing the palpi and epigyna of spiders to illustrate the papers which he wrote in collaboration with his equally gifted and charming wife. I was privileged to collaborate with them in one paper (on the *Lyssomanae*) and to help them during the summers in their field work on the wasps at Pine Lake, Wisconsin. Under Peckham's management the biological work of the Milwaukee high school was carried far beyond that of any similar institution in the country. There were classes in embryology with Foster as a text. We possessed a Jung microtome and the paraphernalia for staining sections and demonstrating the development of the chick, and, of course, the classes in physiology were required to master Huxley and Martin. While at Ward's I had purchased Carnoy's *Biologie Cellulaire* and had imbibed from it an intense but rather ineffectual interest in cytology. Then most fortunately, Mr. E. P. Allis established his 'Lake Laboratory' in his residence near the high school and appointed Prof. C. O. Whitman as its director and Dr. William Patten, Dr. Howard Ayres, and Mr.

A. C. Eycleshymer as assistants. These gentlemen were, of course, actively spreading the gospel of the new morphology. Doctor Patten, only four years my senior and fresh from Leuckart's laboratory in Leipzig, taught me the latest embryological technique and suggested that I take up the embryology of *Blatta* and other insects. I find that I devoted nearly all my spare time to this work till 1890.

"In the meantime the Milwaukee Public Museum had been established according to the plan suggested by Professor Ward, and I saw an opening for Akeley as its taxidermist. I persuaded him to come to Milwaukee and live with me. He arrived November 8, 1886, and although he was not officially appointed to the institution till November 20, 1888, he was given a certain amount of its work. We converted a barn on my mother's place into a shop and here he worked at least during the evenings for several years. I was made custodian of the Museum, September 19, 1887, and held the position till August 29, 1890. By that time my association with Peckham, Whitman, and Patten had converted me into a hard-boiled morphologist, and I was induced by Whitman to accept a fellowship at Clark University, where he had become professor of zoology a year earlier. Till October 1, 1890, when I left Milwaukee for good, Akeley and I had spent so many happy hours together that the parting was painful. After leaving the high school I had fitted up a laboratory in the house and when my eyes grew weary with the microscope I repaired to his shop and read to him while he worked or more rarely he read to me. My diary mentions the volumes we read and I wonder at Akeley's patience and apparent pleasure in listening to Bryce's *American Commonwealth*, translations of Aeschylus, Max Nordau, and similar highbrow stuff. I patiently read a whole small library for at that time I had serious conscientious objections to beginning a book without reading its every word. Perhaps Akeley really heard only occasional important fragments and had found that he could carry on his own trains of inventive thought better when we were together and I was making a continual but not too disturbing noise."

Such is the glimpse that we can gain into Wheeler's early life as recorded by himself. During this period he had graduated from the German-American Normal College (1884), had worked for the greater part of a year as an assistant in Ward's Natural Science Establishment (1884-1885), had taught German and physiology in the Milwaukee High School (1885-1887), and had served as Custodian of the newly established Milwaukee Public Museum (1887-1890), an amazing degree of activity

for one just turned twenty-five years of age. Looked on as a preparation for future work this body of training and experience could scarcely have been excelled. Devoid of the restraints of academic surroundings and free to expand by normal means, Wheeler's youthful growth was one of unexampled progress. Well grounded in languages both ancient and modern, conversant with the historical past, and filled with enthusiasm for biology and its future, he was ready for his life-long work in productive scholarship. Exceptional as this outlook was, it is remarkable how naturally and simply it was attained. Free of the cumbersome conventions of an educational system, Wheeler moved directly and without embarrassment to the end in view.

The formal beginnings of scholarly output from any research worker are as a rule shown in his publications. In this Wheeler made an early start. Probably his first published article was the catalogue of mollusks and brachiopods already referred to in his diary and prepared for Ward's Natural Science Establishment. This catalogue, which was by no means a mere price-list of the materials available at Ward's, was used for many years by conchologists, both amateur and professional, in the classification and arrangement of their specimens. It was at once trustworthy, compact, and inexpensive. It was put forth anonymously and without date, like a picture by an Italian primitive, but those who used it knew its author. On his return from Rochester to Milwaukee, Wheeler prepared a list of the trees of his native city (1885) and the next year he published his first entomological paper, an account of the beetles from the lake beaches of Milwaukee County. Thus began that incomparable series of scientific publications that reached without interruption from this early period to the time of his death.

By a strange but fortunate coincidence, Milwaukee in the later years of Wheeler's residence there became a center of unusual zoological activity. The director of the Lake Laboratory, Dr. Whitman, and two of his assistants had recently returned from study in the European zoological centers and were filled with enthusiasm for the new morphology, its fascinating problems, and how to attack them. In this company, Wheeler found himself a welcome guest and soon became, to use his own ex-

pression, "a hard-boiled morphologist." At about this time, 1887, Whitman, with the cooperation of E. P. Allis, Jr., launched the new *Journal of Morphology* and the next year, 1888, he undertook the establishment of the Marine Biological Laboratory at Woods Hole, Massachusetts. To the small circle of workers in Milwaukee these days must have been days full of feverish excitement. Wheeler once related that while he and Patten were walking from the Lake Laboratory, Patten was suddenly taken with an idea about the ancestry of the vertebrates and, as was characteristic of him, elaborated the whole matter on the spot and at great length. This idea, that vertebrates were derived from arachnid ancestors, subsequently occupied Patten during the greater part of his life, but in Milwaukee it struck him all in a moment. It was Patten also who instigated in Wheeler the desire to study insect embryology and suggested to him that he take up the investigation of the development of the common cockroach. This subject occupied much of Wheeler's spare time in his later years at Milwaukee where its investigation was carried on by him in part at the Milwaukee High School and in part at the Lake Laboratory. In 1889 it appeared under the title of "The Embryology of *Blatta germanica* and *Doryphora decemlineata*" in the third volume of the *Journal of Morphology*. This study was followed in 1893, after Wheeler had gone to Clark University, by his "Contribution to Insect Embryology," also published in Whitman's new journal. These two papers have long been recognized as classics in their fields of research. The first, done in Milwaukee, is a tribute to the intense zoological activities of the place and particularly of the Lake Laboratory. Here researches in other directions and by other workers were progressing with prodigious strides, and into this whirl of scientific activity Wheeler threw himself without reserve.

But the Lake Laboratory was not to maintain itself long. It soon lost its first director, Dr. Whitman, after which it steadily declined. Other institutions were arising. Clark University had been founded for research in Worcester, Massachusetts, and distinguished scholars in many fields were being called to it. The eminent psychologist, Dr. G. Stanley Hall, was its new

president and through him Dr. Whitman was invited to be head of its department of biology. Whitman accepted the offer and was followed by Wheeler who in 1890 became Fellow and Assistant in Morphology at Clark. Here new associations were to be made, and Wheeler found himself on terms of growing intimacy with Dr. Sho Watase, the promising Japanese zoologist direct from the biological laboratories of Johns Hopkins University. Dr. Jacques Loeb, the brilliant young general-physiologist on a brief visit to Clark also made Wheeler's acquaintance. Both these men particularly in consequence of their later association with Wheeler in Chicago became his life-long friends.

During his sojourn at Clark, Wheeler continued his work on insects and published in this period some ten papers almost all of which were entomological in substance. In 1892 he presented himself as a candidate for the degree of Ph.D. on the basis of his work on insect embryology and Clark University granted him that degree.

But the situation at Clark was not a happy one. The members of its faculty were newly brought together and, never having been associated before, their relations were not without friction. As a research university, Clark did not especially encourage the coming of a body of students and consequently the lack of flow through its gates of the young life so essential to the welfare of all such institutions made itself felt, especially among certain of the older men. An atmosphere of discontent arose and openings in other universities were sought by those who only one or two years before had looked upon Clark as a scholar's Utopia. Dr. Whitman received a call from the newly opened University of Chicago. This he accepted and carried with him to this new academic center Dr. Watase and Dr. Wheeler. Thus Wheeler in 1892 became Instructor in Embryology at Chicago under Dr. Whitman. This post he held till 1897 when he was advanced to Assistant Professor in his chosen subject.

As a preparation for his new duties in Chicago, Wheeler spent the academic year of 1893-1894 in Europe. He first went to the Zoological Institute at the University of Würzburg whose new director, Professor T. Boveri, had just succeeded the late

Professor C. Semper, the founder of the new Institute. Here Wheeler made first-hand acquaintance with student life in a German university. Part of the winter of 1893-1894 he spent at the Naples Zoological Station whose genial director, Dr. Anton Dohrn, did much to advance his interest in marine zoology. At the Naples Station, Wheeler occupied the table supported by the Smithsonian Institution. Though an inland man by both birth and training Wheeler's first acquaintance with marine life was not at Naples, for he had already spent, while in America, the summers of 1891 and 1892 at the Marine Biological Laboratory at Woods Hole. But the fauna at Naples was a great novelty to him and an unending stimulus to research. Here he began his studies on the sex life of *Myzostoma*, a subject which he carried with him to the Institut Zoologique at Liège, Belgium, where he worked in the laboratory of Professor E. Van Beneden. Subsequently his monograph on *Myzostoma* was published by Van Beneden in the *Archives de Biologie* (1897).

On his return to America in 1894 Wheeler settled down in Chicago to five years of active university work as a teacher of embryology. Of the score or more papers published by him during this period about half of them have to do with insects showing the predominantly entomological trend of his interest, a trend that dated back to 1885 when in Milwaukee he met Dr. and Mrs. George W. Peckham. These two ardent and accomplished entomologists fostered, as the extracts from Wheeler's diary show, his growing interests in the insect world.

In Chicago, Wheeler met, and on June 28, 1898, married Miss Dora Bay Emerson of Rockford, Illinois, a woman of great personal charm and delightful presence, who in the years that followed made his household a hospitable center for friends and for distinguished visitors from all quarters of the globe.

Wheeler's scientific interests though strongly entomological were never limited to this field. The fact that in Chicago he taught embryology for over five years is sufficient evidence of this. It is therefore not surprising when in 1899 he was offered the Professorship in Zoology with its wider outlook at the University of Texas, Austin, Texas, he should resign his position in Chicago and move to this southern institution. Here he remained

for about four years in what might be called an almost pioneer academic atmosphere, for the University of Texas combined at once persons of great refinement as well as those of a more rugged temperament. His publications over this period number about two score and are remarkable for the fact that almost three-fourths of them deal with ants, the group of insects which during the remainder of his days were to claim his chief attention. His other publications show an increasing breadth of scientific interest, for beside reviews in such diverse directions as Korschelt and Heider's "Textbook of Embryology" and Calkin's "Protozoa" he has much to say on the social life of ants, their mixed colonies, myrmecophiles, and the never-ending problem of organic evolution.

During this period students in his chosen field began to resort to him. C. T. Brues and A. L. Melander, both now well known entomologists, sought to study under Wheeler in Chicago, but having found him removed to the University of Texas, they made their way to Austin and spent several years there in his laboratory. Thus began an influx of younger, capable men who as pupils and scientific associates sought him out for longer or shorter periods of study and research under his guidance. During Wheeler's stay in Texas his two children were born, not, however, in Austin, but in Rockford, Illinois, the home town of his wife.

Rather overfired with the duties of teaching and of laboratory management, Wheeler was induced in 1903 to resign his position as Professor of Zoology in Texas and to accept the Curatorship of Invertebrate Zoology in the American Museum of Natural History in New York City. Here it fell to him to organize and arrange the Hall of Invertebrate Life and this beautiful exhibit with its remarkable display of specimens and its many truly wonderful glass models stands as a token of Wheeler's endless industry and good management. Behind the scenes he was occupied with work on the insects and, as his four score publications from this period show, his attention was devoted almost exclusively to the ants. His work on these insects was in no sense restricted, for he was active not only in the description of new species and in their classification but in their structure, func-

tions, distribution, habits and above all in their social relations and ecology. At no time during his earlier life had Wheeler so concentrated his activities on a special group of related problems as he did during his five years as Curator at the American Museum and at no time before had the results of his work been more brilliant and permanently enduring. The most conspicuous product of this period was the volume he contributed to the Columbia University Biological Series entitled "Ants: Their Structure, Development and Behavior." On the pages of this book are epitomized the intense work of a decade by one whose genius was at its full height.

But once a teacher always a teacher, and after five years of museum work, Wheeler felt the call of the lecture table, the laboratory, and the daily contact with aspiring young workers all of which together form an atmosphere, the nearest approach to a scientific scholar's ideal. Consequently when a call came to him to become Professor of Economic Entomology at the Bussey Institution of Harvard University he accepted it without reluctance and entered a new academic environment in which he was to remain longest of all. Here he worked almost thirty years, for in one capacity or another he was intimately associated with Harvard University from 1908 till his death in 1937. This final period in Wheeler's career must be looked upon as the one in which the great promise of his early days achieved complete realization and his genius ripened to full maturity. Over about two thirds of this period (1908-1926) he was Professor of Economic Entomology, a title which indicated the general trend of the Bussey Institution, but this title he preferred to change, and from 1926 to 1934 he served under the more general and certainly the more appropriate designation of Professor of Entomology. In 1934 he was made Professor of Entomology Emeritus. From 1915 to 1929 he was Dean of the Faculty of the Bussey Institution and from 1929 to 1937 he was Associate Curator of Insects in the Museum of Comparative Zoology. During the whole of the period of his association with Harvard University in recognition of his services at the American Museum of Natural History he was a Research Associate of that Museum.

Wheeler's entrance into the Bussey Institution came directly

after the reorganization of that body and he found himself associated there with a growing group of research workers in biology. At that time the Bussey Institution was one of the Graduate Schools of Applied Science under the deanship of Professor Wallace C. Sabine. On the dissolution of this body in 1914, the Bussey acquired a faculty of its own of which Wheeler was made dean (1915). Meanwhile Dr. W. E. Castle in animal genetics and Dr. E. M. East in plant genetics had joined this group and as an assistant to Wheeler had been added Mr. C. T. Brues, Instructor in Economic Entomology.

Following the establishment of the Bussey Faculty a number of other biologists joined its ranks and with its growth in advanced students the Bussey quickly became under Wheeler's leadership an institution for biological research, known the world over. As an administrative officer Wheeler was not always a complacent one for the university official to deal with. He was strenuously insistent that the institution of which he had charge should be properly manned and sufficiently supported and his insistence often brought him into conflict with those whose duty it was to provide the means to these ends. Never in any sense self-seeking, Wheeler nevertheless could on occasion assume a rigorously militant attitude when the general welfare of the Bussey was at stake and much of its remarkable growth at his hands depended upon the ability of its Dean to obtain resources from those who to him seemed to have but a niggardly conception of the functions of the Institution.

Wheeler's publications during this period numbered nearly three hundred. They were predominantly entomological and chiefly concerned with ants though they frequently dealt with these creatures in their most general phases. Many of his contributions had to do with the social life of ants and of other insects much of which was summarized, often with a delicately ironical turn, in his volumes "Social Life among the Insects" (1923), "Les Sociétés d'Insectes" (1926), "Foibles of Insects and Men" (1928), and "The Social Insects, their Origin and Evolution" (1928).

His interest in the philosophy of biology came to the surface in his vigorous espousal of Alexander's theory of emergent

evolution as shown in his article in *Science* "Emergent Evolution and the Social" (1926), and in his two booklets "Emergent Evolution and the Social" (1927) and "Emergent Evolution and the Development of Societies" (1928) in both of which he pointed out that any animal society was as much a soil for emergent growth as was the single creature. To him Hobbes' conception of society as an organism was a self-evident fact of nature. His historical feeling for his subject appeared in his discovery and translation of a lost manuscript by Réaumur, "The Natural History of Ants" (1926), and in the editing and publication with his colleague Dr. Thomas Barbour of "The Lamarck Manuscripts at Harvard" (1933). His essays of this period include such choice efforts as "The Termitodoxa, or Biology and Society" (1920), in which Wee-Wee, the Neotenic King of the 8,429th Dynasty of the Bellicose Termites discourses on the advantages of the white-ants' social life as compared with that of man, and "The Dry-Rot of Our Academic Biology" (1923) in which with cutting humor the "flubdub" of the academic biological world is laid bare. These are but a few of the choice fruits from the last of Wheeler's harvests.

When Wheeler in 1908 came to Harvard he took up residence in Jamaica Plain not far from the Bussey Building. As the Bussey was located in Forest Hills some eight miles from Cambridge his Harvard colleagues in natural history, mostly resident in Cambridge, saw relatively little of him. When the new Biological Laboratories were opened in Cambridge in September, 1931, in close proximity to the Museum of Comparative Zoology, it was decided to transfer the members of the Bussey Institution to this new location and provision was made for them in the new building. Wheeler with others came to the new situation and there began a life of much greater intimacy with the Cambridge biologists. Meanwhile in 1924 he had changed his residence from Jamaica Plain to Boston and thus came to live much nearer to the Cambridge centers. In his new Harvard surroundings he settled down with great complacency having two private laboratories, one in the Museum of Comparative Zoology among the insect collections and the other in the Biological Laboratories. That he spent more time in the latter than in the former resulted

from his habit of smoking while at work. Smoking because of fire risk was prohibited in the Museum, but was allowed in the Biological Laboratories.

Wheeler always arrived early in Cambridge for his day there, being usually driven in a car from Boston by his daughter. By nine o'clock he was to be found, as a rule, at his laboratory table in the biological building. Here he commonly worked till about noon, when he repaired to the Museum, where in the quarters of its Director, he took lunch. This mid-day rendezvous called by its frequenters "the eatery" was a center to which were invited many of the biological notables temporarily in Cambridge. It was therefore an interesting and stimulating gathering to which Wheeler added much and in which he took great delight. In the afternoon he usually worked either in his quarters in the Museum or in those in the Biological Laboratories. In the late afternoon he was driven back to his home where, if there were no social engagements, he was to be found in his study amidst books and manuscripts.

It was after a day much as that just described that he died suddenly of heart failure in Cambridge. He had dined at home and then for some unknown reason had been led to return to Cambridge, probably to make good some omission of the day. He could have stayed in Cambridge only a short time, for his death took place on the Boston-bound platform at the Harvard Subway Station early in the evening. This was on Patriots' Day, the nineteenth of April, 1937. He was survived by all his immediate family, his wife, Mrs. Dora Emerson Wheeler; his son, Dr. Ralph Emerson Wheeler; and his daughter, Miss Adeline Wheeler.

Wheeler was quietly fond of those he chose for his daily companions and he had in the best sense a warm heart for those nearest to him. Like his beloved ants, he was essentially social. In Boston he was often to be seen at the meetings of the Thursday Club and the dinners of the Academy Round Table and he was the center of a small group of older men who met informally at luncheon week by week in reminiscence of their European student days and early life. On all such occasions he was a

charming and delightful companion full of wit and rich in anecdote.

He was elected a member of the National Academy of Sciences in 1912 and attended its meetings with much regularity. He also held membership in many other scientific societies such as the American Philosophical Society, the American Academy of Arts and Sciences, the American Association for the Advancement of Science, the American Zoological Society of which he was a past president, the American Society of Naturalists, the American Ecological Society, of which he was at one time vice-president, the Philadelphia Academy of Natural Sciences, the Boston Society of Natural History, vice-president at the time of his death, the Washington Academy of Science, the New York Academy of Science, and, among foreign societies, the Zoological Societies of France and of Belgium, and the Entomological Societies of London, of France, and of Belgium. He was the recipient of the Elliot Medal from the National Academy of Sciences (1922) and of the Leidy Medal from the Philadelphia Academy of Natural Sciences (1931). In 1925 he served as Harvard Exchange Professor with France. He held honorary degrees from a number of universities: Doctor of Science from the University of Chicago (1916), from Harvard University (1930), and from Columbia University (1933) and doctor of Laws from the University of California (1933). In 1934 the French Republic made him an Officer in the Legion of Honor. Wheeler took a real pleasure in the distinctions bestowed upon him, but these honors never disturbed his unassuming demeanor and native modesty. The presentation of the Elliot Medal called from him an interesting account connected with his early friendship with Carl Akeley. It shows at once Wheeler's unbounded sense of humor even when the occasion was the reception of a very high honor, the Elliot Medal. It cannot be narrated better than in his own words:

"In 1894, soon after returning to the University of Chicago where I was then instructor in embryology with Professor Whitman, I learned that Akeley was at the Field Museum. I naturally looked forward to a renewal of our old intimacy but was informed that this was impossible. It seems that Professor Elliot, whom I had never met, disliked the zoological department

of the University, probably because of its strong morphological bias and the outspoken contempt of a few of its members for taxonomy, and I was naturally included as a *persona ingrata*. Moreover, he realized that he had captured a prize in Carl Akeley and was afraid that the secrets of his technique might leak out and be appropriated by some other museum. He therefore forbade any visits and kept Akeley closely confined, and as he worked every day and far into every night, I was able to see him only once or twice during all the years I was still to remain in Chicago. Professor Elliot's procedure was not devoid of humor, because I was, of course, perfectly familiar with Akeley's methods and could have made no use of them even had I wished to do so. Many years later fate brought an ironical atonement when the National Academy of Sciences conferred on me a medal which had been established by this same Professor Elliot!"

Wheeler was an omnivorous reader and he consumed volumes at a prodigious rate. His early and thorough training in languages received under the rigid discipline of his German schoolmasters in Milwaukee remained with him throughout his life. He had full command of Greek and of Latin so that he read the classics in these languages with ease. He would even pick up a modern Greek newspaper and work his way through a paragraph. The chief European tongues of today were at his command. In consequence he could read almost anything that seemed worth while. He was as familiar with Aristophanes as with Aristotle, and what was true of Greek was also true of Latin, French, German, and English. A passage from a modern Spanish novel was once read to him in English translation. He took it down at once to reread it in the original, for he was certain it would have a finer turn in the Spanish phrasing than in the English translation. His hours of reading were any spare time. When a close companion happened to be away with him at a scientific meeting or other such gathering and occupied the same room or an adjoining one, Wheeler would often wake at some such hour as six, call to hear if his companion too was awake, and if so, he would begin reading aloud at this early morning hour from some volume he had near at hand. Thus an unusual moment was made to serve his purpose. Notwithstanding his statements to the contrary, what he read he remembered, but he did not hesitate to reread books many times. It

has been well said of him that he was “possibly the most widely read member of his university,” for his reading included belles-lettres as well as science, in short all literature.

As a result of his early, excellent training in languages and of his wide acquaintance with letters, his own style was unusual in clarity and literary flavor; to quote again from a recent appreciation of him, his writing had “a force and a polish, not to mention other qualities, that recall Voltaire. His printed 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.”

Wheeler’s reading and reflection led him to approach special biological problems with a breadth of view not always shown by his colleagues. He was well versed in the history of his science and he was fully aware that that science and in fact science in general was no longer the handmaid of philosophy. Science in itself was to him a growing and gradually all-pervading system of philosophy. This view is now so generally accepted even by the modern philosopher himself that he has given up the invention of systems and shapes his conceptions on what science is gradually discovering. He no longer constructs frames into which science is supposed to fit. Wheeler was perfectly at home in this concept and did his share as a guide to philosophic thinking. He knew the systems of the past as did few others, even the professed philosopher, and yet he was not overawed by them, but chose to dissect them and adopt from them in an eclectic way what they seemed to contain for the present. His truly remarkable acquaintance with what had gone before as well as his unusual linguistic attainments made it possible for one of the wisest of our living thinkers, Professor Whitehead, to characterize him as the only man he had ever known who would have been both worthy and able to sustain a conversation with Aristotle. Yet, as has been pointed out, Wheeler was always soundly scientific in that he relied on the gathering of rigidly controlled observations and the consolidation of these into consistent general concepts as the basis for a universal understanding. Such general views as he held came naturally to him from biological fields and were the outcome of research in these realms. Well he knew the uncer-

tainties and hazards of this kind of occupation, but at no time did he even falter in his belief in ultimate conquest by the scientific method.

One general problem that keenly interested him and on which he repeatedly wrote was that of organic evolution. To him the history of organisms had as much significance for their understanding as their immediate activities had. In this he strongly opposed many in the modern school of general physiology and particularly his old associate Jacques Loeb. Intense and heated were their discussions on this topic. So far as organic evolution is concerned, Wheeler accepted without reserve the importance of Darwin's Natural Selection, but he was no Neo-Darwinist and he never ceased to maintain that the Lamarckian Principle had not been really disproved. It might still have much in it that was worthy of serious consideration. For evolutionary projects and speculation such as these, Loeb and his associates had little or no use and yet the trend of modern biology, much as it has been directed and shaped by these physiological workers, seems now to be turning toward Wheeler's position.

To those who knew Wheeler personally, he was a quiet, modest, unassuming man, the last in the world to reach for distinction and yet happy in its reception. Nevertheless he could be roused to passion, even to strong passion, particularly when the situation seemed to him to carry with it injustice, covered deceit, or insincerity. To none of these indirections would he yield a point and friend or foe must answer him in the open. Yet this passionate side of his nature was not shown to all. In his sketch of Carl Akeley, already quoted, he remarks, "I cannot recall that we were ever even on the verge of a quarrel," and there were many whose personal relations with him were never disturbed by so much as a ripple. Wheeler is too near the present generation to allow any one to form an estimate of his genius, for genius he had in the fullest sense. As a man of scientific letters he was supreme. He was possessed of extraordinary knowledge. He was worthy of all and more than all the distinctions that came to him. His sincerity was beyond reproach. To paraphrase from a recent tribute to him, he was a great experience in the lives of those who knew him and his departure leaves a void that nothing can fill.

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For the preparation of the following list of publications by Professor Wheeler, the author of this Biographical Memoir is under obligation to Professor C. T. Brues and Professor F. M. Carpenter.

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