

She was well known to many members of the Indiana Academy of Science. She was interested in the Academy and its work. In 1923, she was elected Assistant Secretary and served in that office until she left the state of Indiana.

Mrs. Haas was born near Albany, Indiana, August 23, 1899. She was the eldest child of Mr. and Mrs. John Bell. After graduating from the Albany High School in 1917, she entered the Normal School at Muncie where she prepared to teach in the intermediate grades. She taught fifth grade work in Albany and in Elkhart. Feeling the need of more training, she entered Indiana University where she received her A. B. degree in 1922.

In the fall of 1922, she was appointed assistant in the Botany Department of Indiana University. She completed her studies and received her A. M. degree in Botany in 1924. Her thesis—"Some Anomalies in the Development of the Seed of *Pinus*," is published in the Proceedings of the Indiana Academy of Science, Vol. 34, 1925 (1926).

In 1924, she accepted a position to teach Science in the Harrisburg, Illinois, High School where she remained for three years.

On August 8, 1928, at Albany, Indiana, she was married to Mr. Frank H. Haas, Jr., of Sorrento, Florida. She went with her husband to their home about two miles south of Sorrento, Florida where she resided until her death.

Mrs. Haas was a devout christian. Her interest in the church was deep rooted and continued from early childhood until her death. She was cultured, refined and artistic. She made and kept many friends wherever she lived. To know her was to love and respect her. Her influence in the Cosmopolitan Club on the University Campus will be carried around the world by the foreign students who knew and loved her there. The same kind congenial disposition made the atmosphere of her home such that one wished to linger there. Now, only the memory remains.

FLORA A. HAAS, Conway, Arkansas.

OLIVER P. HAY

JEFFERSON CO., INDIANA.

May 22, 1846.

WASHINGTON, D. C.

November 2, 1930.

Oliver Perry Hay, an original member of the Indiana Academy of Science, and its sixth president, died at his residence in Washington, D. C. on the 2nd of November, 1930.

Dr. Hay was born May 22, 1846, on a farm in Saluda Township, Jefferson County, Indiana. He was the eldest of fourteen children of Margaret (Crawford) and Robert Lyle Hay. His paternal ancestors were Scotch Dissenters who had come to America shortly before the war of 1812. His maternal ancestors, of mixed Scotch and Irish blood, had come from New England by way of North Carolina and Kentucky, probably as members of one of the bands of settlers that followed the Wilderness Trail of the early pioneers. There is no record to show that any of these ancestors achieved any special prominence.

In 1850, attracted by the cheap and more fertile lands farther west, several members of the Hay family migrated to central Illinois, where the father of the subject of this sketch settled on a farm about two miles east of the present town of Bradford. Most of the country about this farm was open prairie, but three miles to the east was an extensive piece of woodland, known as Boyd's Grove, where there were a school, a church, a store, and a few dwellings.

In such surroundings the boy grew up. The necessity of wringing a living from the isolated farm during those early days called for the hardest kind of

labor, to which, as soon as he could do it, he was introduced, and of which, it is recorded, he did his full share. His parents, however, were firm believers in education, and his regular attendance at the Boyd's Grove school was insisted upon. He is said, by former schoolmates, to have been a conscientious and bright pupil.

The date at which he exhausted the resources of the country school is not known to the writer, but at some time before the close of the Civil War he determined to continue his education and selected Eureka College as the most convenient and suitable institution of learning. He was probably influenced in this selection by the fact that he had united with the Christian Church and looked forward to entering the ministry of that denomination. His college course was much protracted since he had to work his way by teaching alternate years in country schools, and it was not until 1870 that he received his diploma.

On the evening of commencement day he married Mary Emily Howsman, who was to prove a true helpmate whose watchful care throughout his long life was to contribute in no small measure to his success.

Toward the end of his college course his dreams of the ministry had faded away and he had applied himself more and more to science. He supplemented the meager courses offered by the college by reading such scientific books as he could buy or borrow, and before he graduated had impressed his professors with his ability and promise in this field of work.

The following September he was appointed Professor of Natural Science in his *alma mater*. Two years later, having continued his studies while teaching, he was awarded his M. A. degree.

In 1873 he left Eureka, and, after a year divided between schools in Neelyville, Illinois, and Ghent, Kentucky, went to Oskaloosa, Iowa, where for two years he served as Professor of Natural Science in Oskaloosa College.

In the summer of 1875 he gathered up the family which he had accumulated—a wife and three small children—and traveled to New Haven, Connecticut, where he matriculated as a graduate student in Yale University. Here he had courses in zoology under Verrill and Dana, in geology and mineralogy under Brush, and in botany under Eaton, and received from these men a stimulus to exact and patient work which remained with him for the rest of his life.

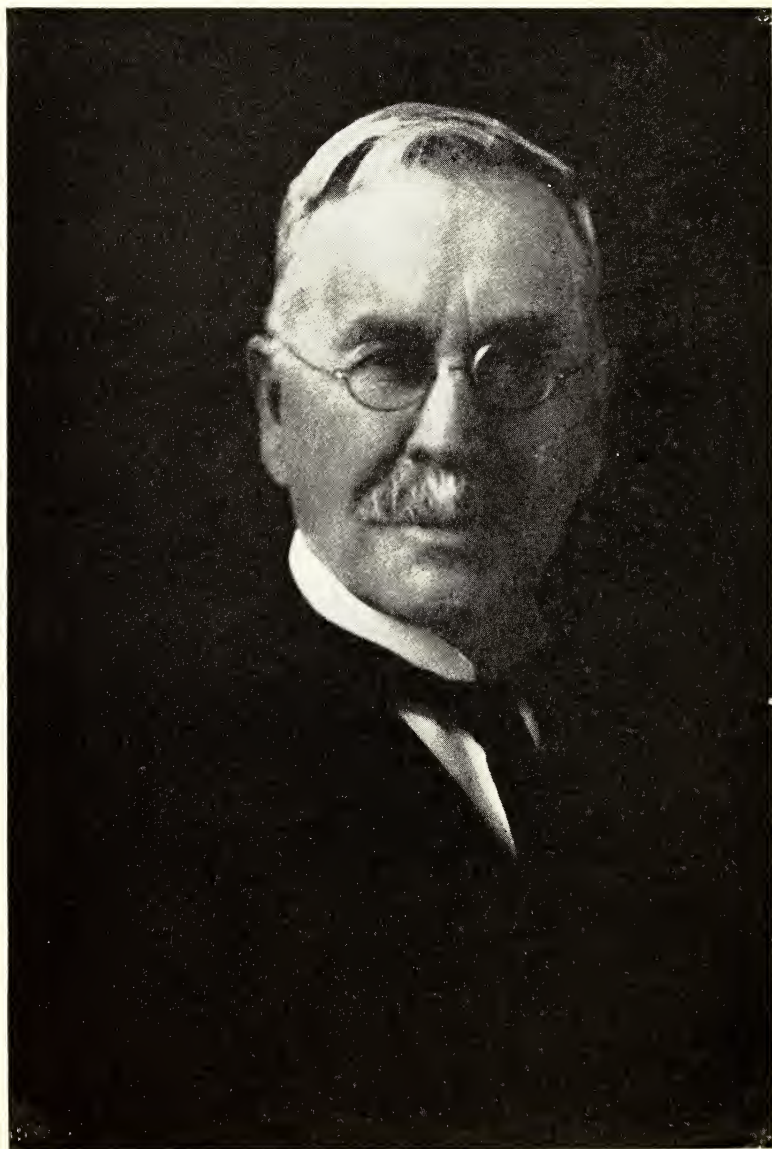
Returning to Illinois, he spent a summer at Normal working with Prof. S. A. Forbes, and was then engaged by Abingdon College, where he remained for two years as Professor of Natural Science. It was while he was at Abingdon that he published his first three scientific papers: "An Examination of Prof. Leo Lesquereux's Theory of the Origin and Formation of Prairies,"¹ "Description of a new species of *Crangonyx*,"² and "Description of a new species of *Asellus*."³ His interest in the fresh-water crustaceans, as indicated by the last two of these early papers, remained with him for many years, and while he published only two later articles on them he collected them extensively and transmitted his specimens freely to specialists in this branch of zoology.

In 1879 he accepted the position of Professor of Biology and Geology in Butler University, Irvington, Indiana, where he remained until 1892. During a large part of his tenure of this position he discharged not only the duties indicated by his title, but also taught physics and chemistry. In the field of biology he had classes in zoology, botany, histology, and embryology; the preparation of material for laboratory work and the directions for his students calling for an

¹American Naturalist, XII, pp. 299-305.

²Privately printed, issued by the author.

³Bull. Illinois Lab. Nat. Hist., I, No. 2, pp. 90-93.



OLIVER P. HAY

amount of labor and time that the modern college professor can not appreciate. During this period he made two trips to Mississippi to collect fishes⁴, spent a summer in Arkansas tracing the northern limit of the Mesozoic rocks of that state⁵, and devoted another summer to collecting Cretaceous vertebrate fossils in western Kansas. He took a course in medicine at the Indiana Medical College receiving the degree M. D. and carried on post-graduate studies in paleontology, for which, in 1884, Indiana University granted him the degree Ph. D. From 1884 to 1888 he was associated in an advisory capacity with the Geological Survey of Arkansas, and from 1891 to 1894 with the Geological Survey of Indiana.

His publications during this period numbered over thirty: They were mostly short papers treating of fishes, amphibians, and reptiles, but among them were two on fresh-water crustaceans, two on birds, and one on histological methods. In the last mentioned paper⁶ he described a method of preparing museum specimens of animals by infiltrating their tissues with waxes or gums which appears to have escaped the notice of certain recent "inventors" of the process.

In 1892, his position at Butler having become untenable because of his views on evolution, he resigned and removed to Chicago. Here, after an unhappy year of teaching in the public high schools, he secured a fellowship in Chicago University, and, with Dr. George Baur and others, had an opportunity to study the rapidly accumulating paleontological collections of that institution and of the Field Columbian Museum. In 1896 he joined the staff of the Field Museum as Assistant Curator of Zoology, a position which he occupied for about two years. He then removed from Chicago to Washington, D. C., where he remained until 1901, carrying on independent investigations in paleontology.

During the period between 1892 and 1901 his published papers numbered twenty-six, and, with the exception of nine, were on paleontology. Among the exceptions were his extensive reports on "The Batrachians and Reptiles of the State of Indiana"⁷ and on "The Lampreys and Fishes of Indiana"⁸. Shorter papers include one on the fishes of the Kankakee and Illinois rivers, several on the development of the vertebral column of fishes, and one or two on other subjects. It was toward the end of this period that he spent much of his time preparing for publication his "Bibliography and Catalogue of the Fossil Vertebrata of North America"⁹, in which was given, first, as complete a bibliography as it was possible to secure of the books and papers containing references to or descriptions of this group of fossils and, second, a catalogue of species with page references to the literature covered by the bibliography. The bibliography included 4,600 titles of papers, the catalogue probably over 40,000 references, all of which had been verified personally by the author. Published in 1902, the book at once became an indispensable tool for any worker in vertebrate paleontology.

In 1901 Dr. Hay joined the staff of the American Museum of Natural History as Assistant, and later as Associate Curator of Vertebrate Paleontology. During the seven years of his association with this museum he published thirty-seven papers. They were all on vertebrate paleontology, at least a third being on fossil turtles. His interest in the latter group became so great that during the last three or four years he was induced by the Carnegie Institution of Washington to give an in-

⁴Proc. U. S. Nat. Mus. III, pp. 488-515.

⁵Ann. Rept. Geol. Surv. Ark. for 1888, II, pp. 261-290.

⁶American Naturalist, XIX, pp. 526-529, 1885.

⁷17th Ann. Rept. Dept. Geol. and Nat. Resources of Indiana, pp. 409-602 (1893).

⁸19th Ann. Rept. Dept. Geol. and Nat. Resources of Indiana, pp. 146-296 (1895).

⁹Bull. U. S. Geol. Survey, No. 179, pp. 1-868, 1902.

creasing amount of his time to the preparation of a monograph on these animals¹⁰. In the course of this work it was necessary to visit all the larger museums of Europe and America. While he was abroad he served as American delegate to the International Zoological Congress.

In 1907 Dr. Hay returned to Washington, where he continued to reside until his death, spending his working hours at the U. S. National Museum in the study of the collections that were constantly coming in to that great institution. In 1912 he was appointed Research Associate, and in 1917 Associate of the Carnegie Institution, and began to devote his energies to the study of the Pleistocene vertebrate faunas of North America, a task at which he labored until the publication of his reports in 1927¹¹. Meanwhile about ninety other papers issued from his hand. Some of these were brief notes or articles of a page or two, but quite a number were of considerable length and of a monographic character. Notable among the latter were his papers on "The Pleistocene Period [in Indiana] and its Vertebrata¹²," "The Extinct Bisons of North America; with Description of One New Species¹³," "The Pleistocene Mammals of Iowa¹⁴," "Contributions to the Knowledge of the Mammals of the Pleistocene of North America¹⁵," and "Observations on some Extinct Elephants¹⁶." There were also several papers on the phylogeny of the shell of turtles, which constitute a real contribution to the knowledge of that debated subject, and a number of papers on the various finds in this country of the remains of human beings in association with the remains of extinct animals. It was his contention that many, if not all, such finds indicate a much greater antiquity of man in North America than most anthropologists have been willing to concede. His interest in this subject was so great that, despite his advanced age, he made long trips to Florida, Oklahoma, and Texas to study the geology of the localities in which particularly interesting discoveries of this nature had been made and to satisfy himself of their authenticity.

In 1926, having attained the age of eighty, he adhered to his often expressed intention to retire. But he was still vigorous both in mind and body. The last volume of his report on the Pleistocene vertebrates was still in press, a number of small pieces of work needed to be done and retirement for him meant only the relinquishing of a salary and such rearrangement of his affairs as his relatively small retirement pay would necessitate. His working hours remained unchanged. Finally, with minor things cleared away he set himself for the crowning work of his career—the continuation of his bibliography and catalogue of the fossil Vertebrata of North America. He had been accumulating material for this undertaking for several years, reading the literature at night and utilizing otherwise idle time of his typist during the day, but to put it in shape for the printer and to read the proofs was an undertaking which would have utterly discouraged many a much younger man. His great fear was that he would not live to complete the work, but his rugged health and his unquenchable enthusiasm carried him through. The plan of the "Second Bibliography and Catalogue of the Fossil

¹⁰The fossil turtles of North America. Pub. Carnegie Inst. of Washington, No. 75, 1908; pp. I-IV+1-565, pls. I-CXIII.

¹¹The Pleistocene of North America and its vertebrated animals from the States east of the Mississippi River and from the Canadian Provinces east of longitude 95°. Pub. Carnegie Inst. Washington, No. 322, 1923, pp. I-VII+1-499.

The Pleistocene of the middle region of North America and its vertebrated animals. Pub. Carnegie Inst. Washington, No. 322A, 1924, pp. I-VII+1-385.

The Pleistocene of the western region of North America and its vertebrated animals. Pub. Carnegie Inst. Washington, No. 322B, 1927, pp. I-V+1-346.

¹²Geol. Surv. Indian, XXXVI, pp. 538-784, 1912.

¹³Proc. U. S. Nat. Mus. XLVI, pp. 166-200, 1913.

¹⁴Iowa Geol. Surv. XXIII, pp. 1-662, 1914.

¹⁵Proc. U. S. Nat. Mus. XLVII, pp. 515-575, 1915.

¹⁶Issued by the author, pp. 1-19, 1922.

Vertebrata of North America¹⁷ was like that of the volume published in 1902, and will be for all time to come equally indispensable to any worker in vertebrate paleontology. The tremendous growth of the subject is shown by the fact that while the volume of 1902 covered the literature of more than one hundred years, the second bibliography required two much larger volumes to cover the work of slightly less than thirty years. It contained the titles of close to 20,000 papers, and the page references to these, given in the species catalogue, considerably exceed 100,000. As before, all these had been verified by the author. In bringing this monumental work to a conclusion the author had only the intermittent help of a typist and of the expert proofreaders of the printer and of the Carnegie Institution.

Subsequent to the completion of the bibliography Dr. Hay occupied his time in writing short papers, and his family was able to induce him to leave his work a little earlier in the afternoons and even now and then to remain away altogether for a day or two. But his real enjoyment was in work. Throughout his life it was his habit to retire at ten o'clock and to arise not later than six. He was at his office by eight, and usually remained there until around five. After dinner there was an hour or two with his family, and then his study claimed him. The learning of language was his only hobby. During his college days he had courses in Greek and Latin, and his acquaintance with both was kept up to the end of his life. While he was in New York he took up the study of French and German, and became able to read both languages easily and to converse fluently in them. Italian, modern Greek, and Russian were acquired much later sufficiently well to be read with more or less ease. He was always a busy man, carried on from one piece of work to another by boundless enthusiasm and an insatiable desire for knowledge. Nevertheless he was never too busy to lay his own work aside to assist a fellow worker who appealed to him for help or who was seen to be in difficulty from which he needed to be extricated. His fund of humor was one of his most marked characteristics, and he derived even more enjoyment from some joke on himself than on some other person. His preoccupation with his work led him into many an amusing situation, about which he would tell with much gusto and with no attempt at concealment. Until his hearing began to fail, as it did considerably in the last years, he greatly enjoyed attending meetings of the societies to which he belonged, concerts, and the theater. Short automobile excursions into the country where he could wander through the woods, especially if he could be accompanied by his grandchildren, of whom he had five, were a great delight, but long trips, unless there was some definite objective, were not so much enjoyed. His unusual ability to draw enjoyment out of the little things of life as well as the big ones, his happy home life, and his interest in his work kept him young through all his years.

Dr. Hay's last paper¹⁸ was completed less than two weeks before his death and he did not live to see it in print. Another paper¹⁹ came from the press during his last illness, but had been read by him in proof. He left one unfinished manuscript which he laid aside only when he was assured that the sharp pains he had felt about his heart indicated most serious trouble, and that the remedy he had been using would no longer avail. From that time on his submission to the doctor and the nurses was absolute. He soon became unconscious, and after a week

¹⁷Pub. Carnegie Inst. Washington, No. 390. Vol. I (1929), pp. I-VIII + 1-916; Vol. II, (1930), pp. I-XV + 1-1074.

¹⁸On the fossil Mammalia of the first interglacial stage of the Pleistocene of the United States. Jour. Wash. Acad. Sci. Vol. 20, pp. 501-509, Dec. 19, 1930.

¹⁹Fossil vertebrates collected near, or in association with, human artifacts at localities near Colorado, Texas; Frederick, Oklahoma; and Folsom, New Mexico. O. P. Hay and H. J. Cook. Proc. Colorado Mus. Nat. Hist., Vol. IX, No. 2, pp. 1-40, pls. I-XIV.

quietly passed away. He is survived by his wife, two sons, two daughters, and five grandchildren.

At the time of his death Dr. Hay was a fellow of the American Association for the Advancement of Science, The Geographical Society of America, The American Geological Society and the Indiana Academy of Science. He was a member of the American Anthropological Association, American Society of Mammalogists, Paleontological Society of America, The Biological Society of Washington, and the Washington Academy of Sciences.

A complete bibliography of Dr. Hay's writings would extend this article far beyond the space that can be given to it. His most important papers and all his books have already been mentioned and in them will be found lists of his other contributions.

W. P. HAY

DAVID ALLEN OWEN

WORTHINGTON, INDIANA.
December 11, 1852.

FRANKLIN, INDIANA.
October 27, 1930

David Allen Owen was born on a farm near Worthington, Indiana, December 11, 1852, a son of Wilson and Lucinda Owen. He attended the rural school of that vicinity as a boy, and at the age of 18 went to a high school at Point Commerce. After two terms of high school work he secured a teacher's license and taught his first school at Bloomfield, Indiana. These experiences aroused his interest in education and through the influence of friends he enrolled in Franklin College at Franklin, Indiana, from which he was graduated in 1878. The following year he was principal of the High School at Salem, Indiana, and from this position was elected to the faculty of Franklin College, as a teacher of Science, which he held until 1909, when, on account of failing health, he retired under the Carnegie Foundation.

In 1881 he completed the required work and was granted a Master's degree by Franklin College, and on the 50th anniversary of his graduation his Alma Mater gave him an honorary degree of Doctor of Science. In addition to his regular college duties he served a term (1881-2) as Superintendent of Schools of Johnson County, and since 1882 he was U. S. Weather Observer for Johnson County. He did graduate work at the University of Chicago and Woods Hole, Mass. He was a member of the Baptist Church of Franklin, a charter member of the Indiana Academy of Science, and a member of the Phi Delta Theta Fraternity.

In 1880 he married Miss Nettie Paynter of Salem, who survives. An only son, Asa Gray Owen, died in his early boyhood.

Professor Owen's thirty years' service to Franklin College might well be called a heroic adventure in the teaching of science. He was undaunted by meagerness of salary and equipment and the vastness of the field to which he had to introduce his students. He had rare skill in improvising and using simple apparatus that made his laboratory a favorite workshop for students and has developed into the present commodious biological plant. Nor did he allow his own department to absorb all of his enthusiasm. He was constantly on the alert for the general interests of the whole College, and the buildings and grounds show many evidences of his thoughtful planning and care. He was a fine example of a man of deep active Christian convictions who is an enthusiastic scientist. To him every discovery and