

THERE WERE GIANTS IN THOSE DAYS

WILL E. EDINGTON, DePauw University

We are assembled today to honor the founders and charter members of our Academy. We are happy, indeed, to have with us several of our charter members, and in their presence I realize the inappropriateness and possibly the foolhardiness of my attempt to trace and discuss the influences and motives that led to the founding of the Academy. However, it is hardly to be expected that our honored guests, our charter members who are with us today, should be charged and burdened with their own entertainment. On the other hand, it certainly is fitting that the present generation of young Indiana scientists should be made familiar with the early history and development of science in Indiana, and it is with this thought in mind that I have undertaken to outline briefly the struggles and failures of the early scientists to form organizations for the mutual exchange of ideas and to secure greater inspiration to carry on under adverse circumstances, which finally culminated in the founding of the Academy. But it is my intention to trace the history of early organization only so far as they seem to have had some influence in preparing the way for the Academy through their membership.

The history of science in Indiana, and in the midwest for that matter, properly begins in 1825 at New Harmony, on the Wabash River in Posey County. To be sure, the great ornithologist, John James Audubon, had floated down the Ohio River in 1808 and had settled at Louisville with his young wife and had set up a store. Audubon collected birds on both sides of the river and made excellent drawings of them so that when the second great American ornithologist, Alexander Wilson, came down the Ohio in 1810, making bird collections and offering for sale his two volumes of engraved drawings of birds, he met Audubon and found Audubon to possess a better collection of birds and also better drawings. Audubon moved his store to Henderson, Kentucky, in 1811, and he was living there in 1818 when that enthusiastic but eccentric naturalist, Constantine Samuel Rafinesque, visited him while on his way to Transylvania University at Lexington, where he had secured the professorship of botany and natural history. Rafinesque remained at Lexington eight years and during the university vacation periods made long trips collecting plants, fishes and shells; and in some of these trips he crossed the Ohio River into Indiana. Rafinesque, however, was not the first scientist to study plant life in Indiana, for it seems that Michaux, a prominent early American botanist, had visited Indiana in 1795, and had collected and recorded about twenty plants as discovered in his journey from Clark's Hill in Tippecanoe County, to Vincennes. Also, David Thomas in a journey across southern Indiana to Vincennes in 1816 recorded the names of 95 plants, and Nuttall, the predecessor

of Asa Gray at Harvard, journeyed down the Ohio in 1818, making stops at a number of river towns in Indiana. Hence some scientific study had been made of the animal and plant life of Indiana before 1825, but only in a fragmentary manner.¹

Previous to 1825 little was known of the geology of the state, and, although Wyandotte Cave was apparently discovered in 1798, certainly no reliable scientific account of it was available before 1814. It was then known as the "Mammoth Cave of Indiana," and its owner called it "Epsom Salts Cave," doing quite an extensive business of leaching its salts, sulphate of magnesia, potassium nitrate and one or two others, between 1812 and 1820. Also as early as 1804 some local outcrops of coal were known and noted on the map, and a small mine was opened in 1811 at Fulton in Perry County. Robert Fulton, it is said, obtained coal from this mine as fuel for the first steamboat to descend the Ohio River.²

Accordingly, we may safely assume that the boat called "The Philanthropist," locally known as "The Boatload of Knowledge," which floated down the Ohio River in 1825 with the eminent geologist, William Maclure, and the French naturalist and artist, Charles Alexander LeSueur, as part of its cargo, and which finally landed its cargo at New Harmony, brought the first scientists who lived and studied and did intensive scientific investigation in Indiana. These scientists were followed in 1826 by Thomas Say, who has been called "The Father of American Entomology," "The Father of American Conchology," and even "The Father of American Zoology." Maclure, LeSueur and Say were three of the founders of the Academy of Natural Science of Philadelphia, which was founded in 1812. Say died at New Harmony in 1834. In 1827 David Dale Owen, one of the three sons of Robert Owen, came to New Harmony. He returned to London in 1831 for two years of additional study in chemistry and geology, and, upon his return to America, entered the Ohio Medical College from which he graduated in 1836. He did all this additional study in order better to prepare himself for the study of paleontology. Robert Dale Owen was appointed the first State Geologist of Indiana and began his work in 1837. His brother, Richard Owen, born in 1810, was his assistant in later surveys, and I shall discuss his work and influence later.

In fact the reputation of the New Harmony scientists was such as to inspire a visit from such a scientist as Sir Charles Lyell, one of the greatest of all geologists, and New Harmony became a training school for young geologists, such as Edward T. Cox, State Geologist of Indiana, J. G. Northwood and A. H. Worthen, State Geologists of Illinois, B. F. Shumard, State Geologist of Texas, Dr. Robert Peters, Dr. Joseph Leidy, F. B. Meek, and Leo Lesquereux, all of whom worked there. I would have you note the importance of geology in the scientific results following out of the New Harmony experiment.

In 1842 the Indiana Horticultural Society was organized. At that time the Reverend Henry Ward Beecher of Indianapolis was in charge

¹ J. M. Coulter, *A Century of Botany in Indiana*, Proc. Ind. Acad. Sci., 1916.

² W. S. Blatchley, *A Century of Geology in Indiana*, Proc. Ind. Acad. Sci., 1916.



Fig. 1. Charter members present at Golden Anniversary Meeting. Left to right: George W. Benton, Robert Hessler, Stanley Coulter, Amos W. Butler, Willis S. Blatchley, David M. Mottier, Arthur J. Phinney, William A. Noyes, Joseph C. Arthur, J. B. Burris.

of the *Indiana Farmer and Gardener*, a paper devoted to agricultural and horticultural interests. The society failed on account of the difficulty of travel, the great loss of time in travel, the pear blight and other causes. It should be remembered that the railroad, known as the Monon, was not begun at New Albany until 1847 and it did not reach Lafayette until 1854, and it was one of the two first railroads in Indiana. However, the influences that led to the organization of this society were also influential in bringing about the State Board of Agriculture in 1851.

The Indiana Pomological Society was organized in 1860 and in 1864 its scope was broadened and the second Indiana Horticultural Society came into being. It held its first semi-annual meeting in October, 1865, in Fort Wayne, with a number of notable fruit growers from other states present and participating in the program. W. H. Ragan, one of the charter members of our Academy, was the corresponding secretary of this society in 1869 and its secretary in 1872 and again in 1874.

Now I shall digress for a few minutes. In 1819 the American Geological Society was formed but it failed. However, by 1839 no less than fifteen state geological surveys were in operation, so that the time was ripe for a new organization of geologists, and in 1840 the Association of American Geologists was organized in Philadelphia. At the third annual meeting held in Boston the name was changed to The Association of American Geologists and Naturalists. The fourth meeting, in 1844, was held in Washington "in the month following the great national congress of scientific men assembled by the first annual or general meeting of the National Institution for the Promotion of Science." The final result was that the Association of American Geologists and Naturalists met for the last time in 1847 in Boston, for the Association became the American Association for the Advancement of Science, which held its first meeting in the library room of the Academy of Natural Sciences in Philadelphia on September 20, 1848.³

The influence of the American Association for the Advancement of Science spread rapidly, so that in 1858 the Wabash Academy of Science was organized at Crawfordsville. However, at the preliminary meeting held in Crawfordsville "after a full interchange of sentiment among those present, it was resolved to organize a similar institution in Indianapolis that should embrace the circuit of the state, and that should, if possible, secure the united efforts of the devotees of science, as well as the friends of progress, whether learned or unlearned."

"As a preliminary step to state organization, J. S. Bobbs, of Indianapolis, was appointed President; R. T. Brown, S. T. Bowen, and Prof. Thompson, Vice-Presidents; John B. Dillon, of Indianapolis, Secretary, and James Ferguson, Assistant Secretary."

"On the 5th inst., in pursuance of notice and the suggestion from Crawfordsville, there was a meeting held in the Senate Chamber. In the absence of Dr. Bobbs, Professor R. T. Brown took the chair, and Professor Challen, secretary of the Crawfordsville meeting, read the proceedings there had . . ."

"On motion, those present proceeded to the permanent organization of 'The Indiana Association for the Advancement of Science,' by the

³ Summarized Proceedings, American Association of Science, 1929 to 1934, pp. 24-30.

election of the following officers: President, J. S. Bobbs; Vice-Presidents, Prof. Wm. Twining, Prof. John Young, Dr. James Anton; Secretary, Prof. R. T. Brown; Treasurer, James Ferguson."

"The following persons gave their names as members, and paid their memberships of one dollar, to wit: James R. Challen, J. S. Bobbs, J. N. Ray, W. D. Henkle, R. T. Brown, John Young, J. J. Updegraff, G. W. Hoss, T. S. Updegraff, Wm. F. Webster, J. S. Hougham, James Ferguson, Indianapolis; Wm. Twining, Crawfordsville; J. Milton Youart, Lafayette; James Anton, Patokia; J. L. Campbell, Crawfordsville."

The Indiana Association was divided into six sections, as follows: 1. Animal and Vegetable Physiology and Agricultural Chemistry; 2. Natural History and Botany; 3. Geology, Chemistry, and Mineralogy; 4. Geography and Meteorology; 5. Local History, Statistics and Mental Science; 6. Mathematics, Mechanics, and Astronomy. Its president, Dr. J. S. Bobbs, was a surgeon and the first surgeon ever to operate on the gall bladder. He was on the Indiana Asbury Medical Faculty from 1849-1852, and later became a professor in the Indiana Medical College.

With the opening of the Civil War and the entrance of a number of its prominent members into the army, the Indiana Association for the Advancement of Science languished and perished. However, among its members, who were later to become charter members of our Academy, were Dr. Ryland T. Brown of Indianapolis, Professor John L. Campbell of Wabash College at Crawfordsville, and Professor Daniel Kirkwood of Indiana University. Dr. Brown was "Geological Agent" for the State Board of Agriculture in 1852, and later was Professor of Natural Sciences in Northwestern Christian University, now Butler University, teaching, among other things, some chemistry. He was also a prominent preacher. Professor John L. Campbell was Professor of Civil Engineering at Wabash College and was president of our Academy in 1892. Dr. Daniel Kirkwood was Professor of Astronomy at Indiana University.

Following the close of the Civil War it was not long until the scientists in Indianapolis again felt the need of an organization. "In the early part of October, 1870, a call was issued in the daily papers for a meeting at the rooms of the State Board of Agriculture of those favorable to the formation of a society for the promotion and cultivation of science. Pursuant thereto, the first meeting was held on the 18th of October, which was presided over by Prof. E. T. Cox, State Geologist, and attended by about twenty gentlemen. The object of the meeting, as stated by the chairman, was to form an association through which the results of the investigations of its members could be given to the public, and by which, students in scientific knowledge could be assisted and encouraged, a statement which met with the hearty concurrence of those present. Measures were taken to form a constitution, and on the first of November a permanent organization was effected by the election of the following officers:

President—E. T. Cox

Vice-Presidents—Wm. Twining and J. M. Gaston

Corresponding Secretary—W. Webster Butterfield

⁴ Indiana School Journal. 3:339-342; 382. 1858.

Recording Secretary—Dan L. Paine

Treasurer—John W. Byrkit

Librarian—D. M. Berry

Curators—G. M. Levette and Thad M. Stevens

“Articles of Association were duly filed with the proper state officer on the 30th day of December, 1870, and the legal existence of the Academy dates from that time.”⁵

Thus was organized the Indianapolis Academy of Sciences. The Academy held meetings, conducted a lecture course and issued, in 1872, its Transactions, in which were published the constitution, by-laws, membership roll, history, and several papers. It had three classes of membership, namely, honorary, corresponding and resident. The names of Louis Agassiz, J. D. Dana and Asa Gray constitute its honorary membership roll.

Following the death of Thomas Say in 1834, Indiana was without a productive zoologist until the middle fifties, when Dr. Rufus Haymond, a practicing physician at Brookville, with a deep interest in natural history, published a paper in the Proceedings of the Academy of Natural Sciences of Philadelphia, entitled “Birds of Southeastern Indiana,” in which he listed 138 species. Thirteen years later, in the Eleventh Annual Report of the Indiana State Board of Agriculture and the Report of E. T. Cox, State Geologist for 1869, Dr. Haymond published a list of 32 species of mammals of Indiana and 163 species of birds in Franklin County; and he also reported on the physical geography of that county.

In 1873, the great naturalist, Louis Agassiz, established his Marine Laboratory on the island of Penikese in Buzzard’s Bay and there gathered about him a number of students who were to receive such inspiration and insight and reverence for scientific truth from this great teacher as to make felt to this day his influence on American science. Among these students were David Starr Jordan and Joseph Moore. Jordan came to Indianapolis in 1874 as teacher of natural history in the high school. In 1875 he became Professor of Natural Science in what is now Butler University, and in 1879, he became Professor of Zoology at Indiana University. Joseph Moore came to Earlham College as Professor of Natural Science.

Now let us return to Brookville, where on October 1, 1860, was born one who was to become founder of the Indiana Academy of Science, Amos W. Butler. As a youth Butler sat at the feet of the naturalist, Dr. Rufus Haymond, and from him received information and encouragement. In Brookville, from 1878 to 1886, the pastor of the Presbyterian church was the Reverend David R. Moore, who arranged for occasional lectures, some of which were on scientific subjects. Young Butler associated himself with the Reverend Moore, Edgar R. Quick, and a few others who were interested in natural science, so that in January, 1881, the Brookville Society of Natural History was formed with the Reverend Moore as president, Amos W. Butler as secretary, and Edgar R. Quick as correspondent. Thereafter, for several years, a regular lecture

⁵ Transactions of the Indianapolis Academy of Science, 1872, pp. 17-18. Dr. C. C. Deam kindly loaned me a copy of these Transactions.



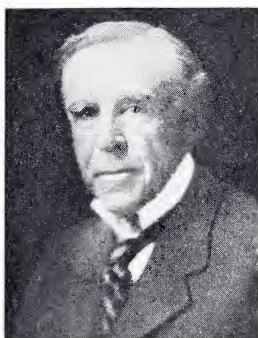
AMOS W. BUTLER



JOHN M. COULTER



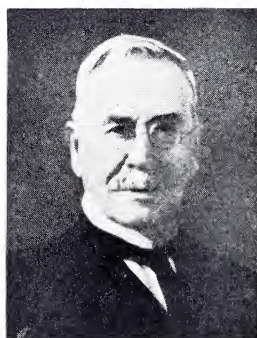
STANLEY COULTER



DAVID W. DENNIS



BARTON W. EVERMANN



O. P. HAY



JOHN P. D. JOHN



LILLIAN J. MARTIN



WM. A. NOYES

Fig. 2. Giants of Other Days.

course was conducted and among the lecturers were David Starr Jordan, John M. Coulter, Charles H. Gilbert, R. E. Call, D. W. Dennis, John Uri Lloyd, J. P. D. John, Daniel G. Brinton, B. W. Evermann, Joseph F. James, Charles W. Hargitt, Stanley Coulter, and John L. Campbell. Also the society encouraged active research and within the next few years the Reverend Moore, Butler, and Quick published a number of papers based on the results of their own scientific studies.

In August, 1881, the American Association for the Advancement of Science met in Cincinnati. Young Butler, not yet 21 years of age, attended this meeting and there met Harvey W. Wiley, T. C. Mendenhall, F. W. Putnam, C. V. Riley, H. T. Eddy, N. H. Winchell, O. T. Mason, Ormond Stone, E. S. Morse, F. E. Nipher, and many other prominent scientists of America. The influence of this meeting and the contacts with the scientists were such that Butler attended the A. A. A. S. meetings regularly for a number of years, he was also so fired with the desire to have regular contact with other scientists of the state that he entered into correspondence with John M. Coulter, Charles R. Barnes, Daniel Kirkwood, David Starr Jordan, Robert B. Warder, Philip S. Baker, Oliver P. Jenkins, T. A. Wyllie, David W. Dennis, John P. D. John, Richard Owen, Stanley Coulter, C. A. Waldo, J. P. Naylor, Charles W. Hargitt, and others. Butler was by no means a stranger to a number of these men for he had been a student under J. P. D. John at Brookville College, a student under John M. Coulter at Hanover College, and a student under Daniel Kirkwood and Richard Owen at Indiana University. Also he knew Barnes at Hanover, and he had previously met Jordan at Brookville. The majority of the men to whom Butler wrote encouraged him with favorable replies.

At the A. A. A. S. meeting, held in Ann Arbor in 1885, several Indiana scientists, among them Butler, met together, and with them John C. Branner, who was that fall coming to Indiana University as Professor of Geology. "It was decided that a State Academy of Science should be organized, also that the Brookville Society of Natural History, as the most active scientific society in the state, be requested to call a meeting for that purpose and prepare a program for it. That society accepted the responsibility and Rev. D. R. Moore, S. P. Stoddard, M. D., and Amos W. Butler were appointed a committee to act." The committee made arrangements for a meeting which was held in the Marion County Court House, December 29, 1885. This meeting was attended by about forty persons and Dr. John P. D. John, of DePauw University, acted as temporary chairman. A permanent organization was effected, a constitution and by-laws were adopted, and David Starr Jordan was chosen as the first president and Amos W. Butler the first secretary. "A program of papers presenting the knowledge of that time of different departments of science in Indiana was carried out" with the following authors and subjects:

Philip S. Baker—Indiana Entomology.

Ryland T. Brown—Indiana Geology.

Amos W. Butler—The Past and Present of Indiana Ornithology.

J. B. Conner—Statistical Investigations in Indiana.



J. C. ARTHUR



CHARLES R. DYER



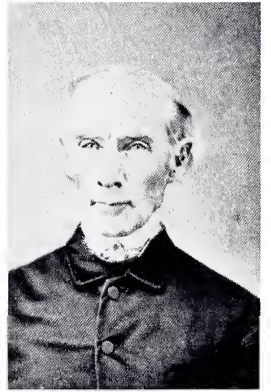
CARL H. EIGENMANN



OLIVER P. JENKINS



DAVID STARR JORDAN



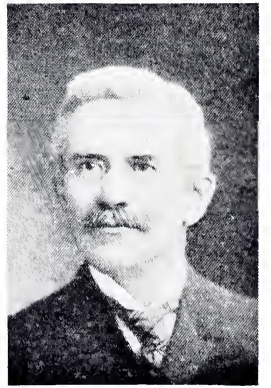
RICHARD OWEN



JOSIAH T. SCOVELL



ALEXANDER SMITH



CLARENCE A. WALDO

Fig. 3. Giants of Other Days.

John M. Coulter—Progress of Botanical Work in Indiana.

Oliver P. Hay—The Present Condition of Our Knowledge of Indiana Herpetology.

Oliver P. Jenkins—Account of the Work Done in Invertebrate Zoology in Indiana.

David Starr Jordan—(1) Sketch of C. S. Rafinesque; (2) Account of the Work Done in Ichthyology in Indiana.

Daniel Kirkwood—Astronomical Study in Indiana.

David R. Moore—Our Knowledge of Indiana Conchology.

Joseph P. Naylor—The Progress of Physics in Indiana.

Richard Owen—Sketch of the Work Accomplished for Natural and Physical Science in Indiana.

Edgar R. Quick—The Progress of the Study of Mammalogy in Indiana.

W. H. Ragan—Meteorology in Indiana.

Josiah T. Scovell—Geographical Studies in Indiana.

Maurice Thompson—Mineralogical Investigation in Indiana.

Robert B. Warder—Chemical Work in Indiana.

Thus was the Indiana Academy of Science founded,⁶ and back of its foundation may be seen the influence of four distinct factors: 1. The scientific influences of New Harmony; 2. the development of geological investigation; 3. the subtle but nevertheless real influence of Agassiz; 4. the inspiration derived from the American Association for the Advancement of Science. Among the charter members of the Academy are found the names of Amos W. Butler, David R. Moore, Dr. S. P. Stoddard, and Edgar R. Quick of the Brookville Society. Of the old association of 1858, Dr. R. T. Brown, John L. Campbell, and Daniel Kirkwood were also charter members of our Academy, and the Horticultural Society is represented by W. H. Ragan. Dr. R. T. Brown, Daniel Kirkwood, Richard Owen, and Frederick Stein of our Academy were members of the Indianapolis Academy of Sciences. Among the geologists we find Richard Owen, A. J. Phinney, George K. Greene, J. L. Campbell, Maurice Thompson, C. R. Dryer, W. S. Blatchley, John C. Branner, and somewhat to our surprise, J. L. Hurty and John M. Coulter. The influence of Agassiz is seen in that splendid group who were influenced by David Starr Jordan; namely: Alembert W. Brayton, Charles H. Gilbert, Seth Eugene Meek, Carl H. Eigenmann, Morton W. Fordice, Barton W. Evermann, Willis S. Blatchley, Oliver P. Jenkins, and finally David W. Dennis, who received his inspiration from Joseph Moore.

Following the first meeting the rolls of the Academy were held open for a time to permit those to enroll as charter members who were unable to attend the first meetings. At the close of the spring meeting of 1886 the number of charter members was 43, but subsequent meetings increased this number to 68, to the best of my knowledge, as determined from the early directories. Of these charter members, fifteen are still

⁶ The information on the founding of the Academy was obtained from Vol. 1 (1891) and Vol. 33 (1923) of the Proceedings, and private correspondence with Amos W. Butler.

with us whom we honor today.⁷ But what manner of men were these charter members? We have not time to discuss all of them, but I believe we owe it to the younger generation of Indiana scientists to mention the deeds of a few who were giants in those days and are still recognized as giants in these days.

AMOS W. BUTLER (1860-). Founder of the Indiana Academy of Science, zoologist and anthropologist. Educated at Hanover College and Indiana University. Student of John M. Coulter at Hanover, and of Daniel Kirkwood and Richard Owen at Indiana. Secretary of the State Board of Charities of Indiana for many years, with a national reputation on account of his work for social welfare. Author of many papers, and the one who knows more about Indiana birds than any other living man. President of our Academy in 1895.

DAVID R. MOORE (1850-1932). Presbyterian minister, archeologist and naturalist. Educated at Miami University, Lane Theological Seminary, and Princeton University. Author of several papers. Active in founding the Indiana Academy of Science.

JOSEPH CHARLES ARTHUR (1850-). Botanist and world authority on plant rusts. Educated at Iowa State College and Cornell University. Professor at Purdue University from 1887 to 1915 and Emeritus-Professor since that time. Author of many papers and authoritative works. President of Botanical Society twice, in 1902 and 1919. President of our Academy in 1893 and now the oldest living past president.

WILLIS STANLEY BLATCHLEY (1859-). Geologist, botanist, and entomologist. Educated at Indiana University. Student of Jordan and Branner. State Geologist of Indiana, 1894-1911; member of the Scovell scientific expedition to Mexico, 1891; author of a large number of important papers on Indiana fauna and of classical volumes on Orthoptera, Heteroptera, and Coleoptera of Indiana, and on the Rhynchophora of Northeastern America. Considered by Evermann to be the most active and enthusiastic naturalist Indiana has ever produced. President of our Academy in 1903.

JOHN CASPER BRANNER (1850-1922). Geologist. Educated at Cornell and Indiana Universities. Professor of Geology, Indiana University, 1885-1892; member of the Imperial Geological Survey of Brazil for a number of years; State Geologist of Arkansas 1887-1892; Professor of Geology, Stanford University, 1892-1915; Vice-President, 1899-1913, President, 1913-1915, Stanford University; Emeritus, 1915-1922. Made numerous trips to Brazil on geological expeditions for that nation. He also went on an expedition in 1880-1881 for Thomas A. Edison seeking a vegetable fibre suitable for filament in incandescent lamp. President of our Academy in 1889.

JOHN MERLE COULTER (1851-1928). Botanist with an international reputation. Educated at Hanover College and Indiana University. Pro-

⁷ J. C. Arthur, George W. Benton, W. S. Blatchley, J. B. Burris, Amos W. Butler, Stanley Coulter, Robert Hessler, David M. Mottier, W. A. Noyes, A. J. Phinney, Morton W. Fordice, Oliver P. Jenkins, Lillian J. Martin, J. P. Naylor, and Henry A. Huston. The first ten were in attendance at the fiftieth Anniversary meeting.

fessor of Natural Sciences, Hanover College, 1874-1879; Professor of Biology, Wabash College, 1879-1891; Professor of Botany and President of Indiana University, 1891-1893; President of Lake Forest University, 1893-1896; Head of Department of Botany, University of Chicago, 1896-1925; President of the American Association for the Advancement of Science, 1919; one of America's outstanding scientists. President of our Academy in 1887.

STANLEY COULTER (1853-). Botanist, conservationist, and a tremendous influence for student good in Indiana college life. Educated at Hanover College. Professor of Biology and Director of biological laboratories, Purdue University, 1887-1926; Dean of Science, 1905-1926, Dean of Men, 1915-1926, Emeritus, 1926- , Purdue University; author of numerous papers on botany and forestry; Head of Indiana State Conservation and Parks for many years. Grand old man of Purdue University. Now with Eli Lilly Company, Indianapolis. President of our Academy in 1896.

DAVID WORTH DENNIS (1849-1916). Naturalist and educator. Educated at Earlham College, Syracuse University, Bonn and Edinburgh Universities. President of Wilmington, Ohio, College, 1879-1881; Professor of Biology, Earlham College, 1884-1916. At the twenty-fifth anniversary meeting of the Academy in 1901, President Foley stated: "There is no man in Indiana who has had more influence upon the teachers of the state, upon the schools of the state; there is no man who has been closer to the hearts of his pupils. There is no man who has had more to do with the development of science in Indiana than has Professor David W. Dennis." President of our Academy in 1900.

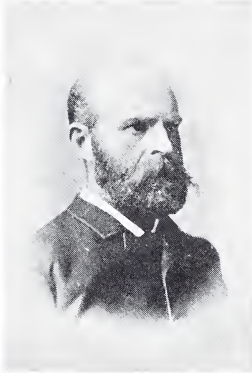
CHARLES REDWAY DRYER (1850-1927). Geologist and Geographer. Educated at Hamilton College, and the Universities of Michigan and Buffalo. Graduate in medicine; assistant in Indiana state geological survey, 1886-1893; Professor of Geology and Geography, Indiana State Normal School, now Indiana State Teachers College, 1893-1913. Author of papers on geology and physical geography of Indiana and of textbooks. President of our Academy in 1911.

CARL H. EIGENMANN (1863-1927). Zoologist and ichthyologist. Educated at Indiana University and one of David Starr Jordan's greatest pupils. Professor of Zoology, Indiana University, 1891-1927; Dean of Graduate School, 1908-1927. Explored in western United States, Canada, Cuba, British Guiana, Colombia, Peru, Bolivia, and Chile. World authority on fishes and another one of America's outstanding scientists. Author of numerous important papers. President of our Academy in 1899.

BARTON WARREN EVERMANN (1853-1932). Ichthyologist, ornithologist, and naturalist. Educated at Indiana University. Another one of David Starr Jordan's great pupils. Professor of Biology, Indiana State Normal School, 1886-1891; U. S. Government Bureau of Fisheries, 1891-1910; Administrator of Alaska Fisheries Services, 1910-1914; Direc-



W. S. BLATCHLEY



JOHN C. BRANNER



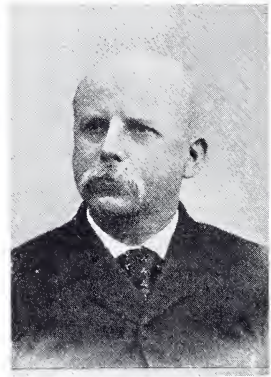
THOMAS GRAY



JOHN S. KINGSLEY



DANIEL KIRKWOOD



T. C. MENDENHALL



DAVID R. MOORE



JOSEPH SWAIN



HARVEY WILEY

Fig. 4. Giants of Other Days.

tor of Museum, California Academy of Sciences, 1914-1932. Author of numerous papers on fishes and birds.

THOMAS GRAY (1850-1908). Engineer of international reputation. Educated at University of Glasgow. Worked under and with Sir William Thomson, later Lord Kelvin, at different periods for a number of years, serving as engineering representative of Kelvin and Jenkins in the manufacture and laying of the Commercial Company's two Atlantic cables. Professor of Telegraph Engineering, Imperial University of Tokio, Japan, 1879-1881, and there he met T. C. Mendenhall, who later became President of Rose Polytechnic Institute and who induced Gray to become Professor of Dynamic Engineering, Rose Polytechnic Institute, 1888-1908. Prepared the Smithsonian Tables, published in 1896. Author of numerous authoritative papers on seismology, mechanical and electrical engineering. President of our Academy in 1897.

OLIVER PEBBLES JENKINS (1850-1935). Physiologist. One of David Starr Jordan's pupils. Educated at Moore's Hill College and Indiana University. Professor of Natural Sciences, Moore's Hill College, 1876-1882; Indiana State Normal School, 1883-1886; Professor of Biology, DePauw University, 1886-1891; Professor of Physiology, Stanford University, 1891-1916; Emeritus, 1916-1935. Joint director with Charles H. Gilbert, a charter member of our Academy, of Stanford Marine Laboratory, 1892-1916. Author of numerous papers.

JOHN PRICE DURBIN JOHN (1843-1916). Mathematician, educator and lecturer. Virtually self-educated. Professor of Mathematics, Brookville College, 1863-1869, President, 1869-1872; Professor of Mathematics, Moore's Hill College, 1872-1876, President, 1876-1882; Professor of Mathematics, DePauw University, 1882-1895, President, 1889-1895; Lecturer, 1895-1916. Debated with Robert J. Ingersoll. Possessed national reputation as lecturer. Influential in religious education. President of our Academy in 1888.

DAVID STARR JORDAN (1851-1931). Ichthyologist, and all round naturalist, educator and exponent of world peace. Probably greatest scientist ever associated with our Academy. Pupil of Agassiz. Educated at Cornell University and Indiana Medical College. Teacher, Indianapolis High School, 1874-1875; Professor of Biology, Butler University, 1875-1879; Professor of Zoology, Indiana University, 1879-1885; President, Indiana University, 1885-1891; President, Stanford University from its founding in 1891 to 1913, Emeritus, 1913-1931. Author of classical scientific works and of numerous papers. A man who inspired men and who has left an indelible impress on Indiana science and education. President of the American Association for the Advancement of Science in 1909. First president of our Academy.

JOHN STERLING KINGSLEY (1854-1929). Zoologist. Educated at Williams College, Princeton University, and University of Freiburg. Professor of Zoology, Indiana University, 1887-1890; University of Nebraska, 1889-1891; Tufts College, 1892-1913; University of Illinois, 1913-1921, Emeritus, 1921-1929. Editor of the *American Naturalist*,

1884-1896; and editor of *Journal of Morphology*, 1910-1920. One of America's leading zoologists.

DANIEL KIRKWOOD (1814-1894). Astronomer and mathematician. Educated at Washington College. Professor of Mathematics and Astronomy, Indiana University, 1856-1886. Author of volumes on "Meteoric Astronomy" and "Comets and Meteors," and of papers on the minor planets or asteroids and the causes of the divisions in Saturn's Rings. Kirkwood pointed out in 1866 that no asteroids have periods that are simple fractions of Jupiter's period and these gaps are known as *Kirkwood's Gaps*. He was called "The Kepler of America." Elected first *Honorary Member* of our Academy in 1890.

LILLIEN JANE MARTIN (1851-). Psychologist. Educated at Vassar College and Göttingen, Wurtzburg, Bonn, and Munich Universities. Teacher in Indiana High Schools, 1880-1889. Vice-principal and head of department of science, Girl's High School, San Francisco, California, 1889-1894; Professor of Psychology, Stanford University, 1899-1916, Emeritus, 1916- . Consulting psychologist. Only woman charter member of our Academy.

THOMAS CORWIN MENDENHALL (1841-1924). Physicist and scientist of national standing. Educated at Normal School, Lebanon, Ohio, and Western Reserve University, but never graduated. Superintendent of Schools, Middletown, Ohio, 1866-1868; Instructor in Physical Science, Columbus High School, 1868-1873; first Professor of Physics, Ohio State University, 1873-1878, 1881-1884; Professor of Physics, Imperial University of Tokio, Japan, 1878-1881; Professor of Electricity, U. S. Signal Corps, 1884-1886; President, Rose Polytechnic Institute, 1886-1889; Chief, U. S. Coast and Geodetic Survey, 1889-1894; President, Worcester Polytechnic Institute, 1894-1901. Retired in 1901, on account of failing health, and spent eleven years in Europe. President of the American Association for the Advancement of Science in 1889, and President of our Academy in 1890.

WILLIAM ALBERT NOYES (1857-). Chemist. Educated at Grinnell College, Johns Hopkins and Munich Universities. Professor of Chemistry, Rose Polytechnic Institute, 1886-1903; Chemist, Bureau of Standards, 1903-1907; Professor of Chemistry and Director of Chemical Laboratory, University of Illinois, 1907-1926, Emeritus, 1926- . Editor, *Journal of American Chemical Society*, 1907-1917. President of American Chemical Society, 1920. Author of numerous important papers on chemistry and one of America's outstanding chemists. President of our Academy in 1894.

RICHARD OWEN (1810-1890). Geologist and naturalist. Youngest son of Robert Owen of New Harmony. Educated in Lanark, Scotland, and Haforyl Andersonian Institute, Glasgow. Graduate in medicine. Professor of Natural Science, Western Military Institute of Kentucky, 1849 ; University of Nashville, 1858-1859; Assistant State Geologist and State Geologist of Indiana, 1859-1861. Served in Mexican War, 1847-1848 and Civil War, 1861-1864. Professor of Natural Sciences,

Indiana University 1864-1879. Elected first president of Purdue University in 1872 but resigned in 1874 before the actual opening of the university. Was succeeded at Indiana University by David Starr Jordan.

JOSEPH THOMAS SCOVELL (1841-1915). Geologist and naturalist. Educated at Oberlin College and Rush Medical College. Professor of Physiology and Geography, Indiana State Normal School, 1872-1881; teacher of science, Terre Haute High School, 1895-1907. Leader of expedition to Mexico in 1892 that ascended Mt. Orizaba and Mt. Popocatepetl, and determined the elevation of the first mentioned mountain. Author of several textbooks and a number of papers in geography, biology, and conchology.

ALEXANDER SMITH (1865-1922). Chemist of national standing. Educated at Universities of Edinburgh and Munich. Came to the United States in 1890 and was recommended by W. A. Noyes to John M. Coultter for professorship of chemistry at Wabash College, which position he held from 1890 to 1894. Professor of Chemistry, University of Chicago, 1894-1911; Professor and Head of Department of Chemistry, Columbia University, 1911-1919. Retired on account of ill health. Author of numerous papers on chemistry. President of American Chemical Society in 1911.

JOSEPH SWAIN (1857-1927). Mathematician and naturalist. Educated at Indiana University. One of David Starr Jordan's pupils. Instructor of Mathematics and Biology, Indiana University, 1883-1885; Associate Professor and Professor of Mathematics, Indiana University, 1885-1891; Professor of Mathematics, Stanford University, 1891-1893; President of Indiana University, 1893-1902; President of Swarthmore College, 1902-1921, Emeritus, 1921-1927.

HARVEY WASHINGTON WILEY (1844-1930). Chemist and public servant. Educated at Hanover College, Harvard University, and Indiana Medical College. Professor of Latin and Greek, Butler University, 1868-1870; teacher of science, Indianapolis High School, 1871; Professor of Chemistry, Butler University, 1874; Professor of Chemistry and State Chemist, Purdue University, 1874-1883; Chief Chemist, U. S. Department of Agriculture, 1883-1912; Professor of Agricultural Chemistry, George Washington University, 1899-1930. Nationally honored and respected for his efforts for pure food laws. One of our Academy's most prominent members, and its President in 1902.

I greatly regret that time does not permit the continuation of the naming of the great scientists who have been members of our Academy. However, I must take time to mention just a few more names without comment, scientists who left Indiana and some of whom are no longer with us: Charles H. Gilbert, Stanford University; Lucien M. Underwood, Columbia University; Charles Wesley Hargitt, Syracuse University; Oliver P. Hay, Carnegie Institution of Washington; Charles Reid Barnes, University of Chicago; Clarence A. Waldo, Purdue University and Washington University, St. Louis; Robert Ridgway, U. S. National Museum; W. F. M. Goss, Purdue University and University of Illinois;

Jerome McNeill, Florida State College; J. Rollin Slonaker, Stanford University; Daniel T. MacDougal, Carnegie Institution Desert Laboratory, Tuscon, Arizona; George T. Moore, Missouri Botanical Gardens; John A. Miller, Swarthmore College; Albert Homer Purdue, Tennessee State Geologist; Charles W. Greene, University of Missouri; A. Wilmer Duff, Worcester Polytechnic; Charles Zeleny, University of Illinois; Mel T. Cook, Porto Rico; Charles T. Knipp, University of Illinois, and many others.

And so I come to the conclusion. I hope this recital of illustrious names of those who have done so much for science in Indiana and our nation, names of scientists who were once active in our Academy as we are active today, will inspire the younger scientists of Indiana to attempt to follow in their footsteps. Indiana produced giants in those days. It is my hope that when the centennial meeting of our Academy is celebrated in 1984, someone speaking with authority may say there were giants in our days.