

HISTORY OF SCIENCE

Chairman: JOHN S. WRIGHT, Indianapolis

Dr. W. E. Edington, DePauw University, was elected chairman of the Section for 1946.

A Brief History of the Department of Biology, University of Notre Dame

THEODOR JUST, University of Notre Dame

Faculty and Courses

The University of Notre Dame was founded on the site of an old mission known as Ste. Marie des Lacs (1830) by the Right Rev. E. Sorin, C.S.C., first President, who came here from Mans, France, by way of Vincennes on November 26, 1842. The Legislature of the State of Indiana granted its charter on January 15, 1844. Like other institutions of its time Notre Dame was then largely a liberal arts college. The so-called Scientific Department was not organized until 1864 and recognized as a distinct unit of the University. This department included courses in physics, chemistry, zoology, botany, mineralogy, geology and comparative anatomy.

The formal teaching of biology, however, preceded the formation of the Scientific Department by many years. "Early records show that 'the Council of Professors' on June 7, 1844, appointed Brother Augustine, C.S.C., to teach botany and zoology." The Bulletin for 1859-60 gives the name of J. E. Tallon, M.D., as professor of physiology, anatomy and botany.

In 1863 Rev. Louis Neyron¹ was made professor of anatomy, physiology, and hygiene, but apparently did not begin teaching until the school year of 1866-67. Rev. Thomas L. Vagnier, C.S.C.,² was also appointed in 1863 as professor of botany as well as of chemistry and physics.

Thus the formation of the Scientific Department as a recognizable entity in 1864 was a mere formality, as science had been taught under the liberal arts program but the success of scientific subjects warranted their being set apart. Since 1867 all students followed the same Pro-

¹ Rev. Louis J. Neyron, born probably in 1803, in France; missionary and famed physician in Indiana, Illinois, and Kentucky 1836-1863 when he came to Notre Dame; served in various hospitals during the Civil War; Professor of Anatomy, Physiology and Hygiene at the University of Notre Dame since the second session of 1866-1867; died Jan. 7, 1888.

² Rev. Thomas L. Vagnier, C.S.C., born March 22, 1839, at New France, near Fort Wayne, Ind.; entered Notre Dame in 1844, joined the community in 1855, Professor of Botany, Chemistry and Physics 1857-1874; died Aug. 1, 1926.

gram of General Science, or sequence of prescribed courses, which was later superseded by five different programs (1907) leading to a Bachelor of Science degree in Biology, etc.

In 1868, when Rev. C. B. Carrier, C.S.C.,³ succeeded Father Vagnier as professor of botany, he also took over the directorship of the Scientific Department, now known as the College of Science. In addition, Rev. John A. Zahm, C.S.C.,⁴ professor of physics, was appointed as assistant director. By that time there were also available four or five competent professors and the scientific course had made an excellent beginning. When in 1874 Father Carrier left for Texas and later for Canada, Rev. Alexander M. Kirsch, C.S.C.,⁵ succeeded him and continued in this capacity until 1918. The term biology appears for the first time in the Bulletin of the University for the school year 1894-95, in which Father Kirsch is listed as professor of biology.

In 1870 a "partial course in medicine" was introduced and a medical department was recognized. Originally taught by Father Neyron, these subjects were taken over by local physicians, namely Drs. John B. Berteling, Francis J. Powers and Thomas A. Olney. By 1907 students were privileged to attend surgical clinics in the new St. Joseph Hospital of South Bend, Ind. As early as 1885 medicine was an optional study during the "Post-graduate Course."

The science of bacteriology appears for the first time in the Bulletin for 1879 in a statement that formal instruction in this subject is given and a completely equipped laboratory for the use of students was added to Science Hall in 1886. Also mentioned is a laboratory in photomicrography with an adjoining darkroom. Father Kirsch was the instructor in both of these subjects.

A notable development was the organization by Father Kirsch of the Laboratory of Cellular Biology, which was said to be the first labora-

³ Rev. Joseph Celestine Basile Carrier, C.S.C., born July 14, 1832, at St. Jouarre, France; arrived in America in 1855 and at Notre Dame in 1860; Master of Arts and Licentiate of Science; chaplain in Grant's Army from 1863 to 1865; trip to France in 1866; Director of Scientific Department and of the Museum, University of Notre Dame, 1867-1874; President of St. Mary's College, Galveston, Texas, 1874-1876; Professor of Natural Sciences, College St. Laurent, Montreal, Canada, 1876-1904; member of many scientific societies and contributor to various scientific journals; died Nov. 12, 1904, at Montreal, Canada.

⁴ Rev. John Augustine Zahm, C.S.C., born June 14, 1851, at New Lexington, Ohio; came to Notre Dame in 1867, was soon appointed Professor of Natural Sciences, Assistant Director and later Director of the Museum; author of many books and articles on scientific subjects (*Evolution and Dogma*, 1896, etc.) and his travels; friend and travel companion of President Theodore Roosevelt, friend of President William Howard Taft; successful lecturer on scientific subjects; distinguished Dante scholar; planned and built Science Hall at Notre Dame; died Nov. 11, 1921.

⁵ Rev. Alexander Marion Kirsch, C.S.C., born Sept. 11, 1855, at Clemency, Luxemburg; 1876-1918 Instructor in Natural Sciences, later Professor of Zoology, after 1877 Assistant Director of the Museum and later Director of the Museum; studied cytology at Louvain, Belgium, from 1879-1883; author of contributions to mammalian anatomy (*An Elementary Course in Mammalian Osteology*, Notre Dame, Ind., 1903), botany, cytology (*Cytology, or Cellular Biology*, published in *The Microscope*, vol. 11, Trenton, N. J., 1891), and mineralogy; died Jan. 15, 1923.

tory of its kind in the United States. Father Kirsch's lectures on this subject were published under the title *Cytology, or Cellular Biology* in the journal "The Microscope" (1891) and given also at the Cold Spring Harbor Biological Laboratory.

In 1904 Rev. Julius A. Nieuwland, C.S.C.,⁶ became professor of botany and remained in that position until 1921. A student of the late Dr. Edward Lee Greene,⁷ he was instrumental in bringing the latter to the University late in 1914. At that time Dr. Greene transferred his entire botanical library and herbarium to the University, where they are still housed. Dr. Greene's stay at Notre Dame was altogether too brief, as he died the next year, Nov. 10, 1915, and was buried at Notre Dame in the community cemetery. After Father Nieuwland had changed over to the Department of Chemistry the late Rev. W. Albertson, C.S.C.,⁸ a former student of Father Nieuwland, took over the teaching of botany and bacteriology until his death in the spring of 1929.

Throughout these years the College of Science functioned in its original organization without separate departments until 1920, when it was reorganized and given its present form. The old course leading to a Bachelor of Science degree was dropped and specialization was required. Owing to the leadership of Father Kirsch the equivalent of the present Department of Biology was functioning long before the reorganization of the College of Science. When Father Kirsch retired in 1918 the late Rev. Francis J. Wenninger, C.S.C.,⁹ took over the headship, to which duty he later added in 1923 that of Dean of the College of Science. He held both of these positions until his death on Feb. 12, 1940.

Since Science Hall had become too small, a new Biology Building was erected in 1936 and in the spring of 1937 the Department of Biology moved into it. Much new equipment is being added and all teaching facilities are thus constantly being improved.

So much for the general background of the administrative aspects and the general functions of the Scientific Department and its successors.

⁶ Rev. Julius Arthur Nieuwland, C.S.C., born Feb. 14, 1878, at Hansbeke, Belgium; Professor of Botany at Notre Dame from 1904 till 1921, Professor of Organic Chemistry from 1921 till his death; Dean of the College of Science, 1920-1923; died June 11, 1936; for additional data see Lyon, M. W., 1937—*Father Nieuwland the Botanist*, and for bibliography consult Amer. Midl. Natur. 17 (4): vii—xv, 1936.

⁷ Edward Lee Greene, born Aug. 20, 1843, in Hopkinton, Rhode Island; Episcopalian minister and missionary in various western states; 1885-1895, Instructor and later Professor of Botany, University of California; Professor of Botany, Catholic University of America, 1895-1904; Honorary Associate in Botany, U. S. National Herbarium and U. S. Department of Agriculture, 1904-1914; University of Notre Dame, 1914-1915; honorary LL.D. from the University of Notre Dame in 1894; died Nov. 10, 1915; see also H. H. Bartlett (1916) and E. D. Kistler (1936).

⁸ Rev. George W. Albertson, C.S.C., born Oct. 1, 1886, near Kalamazoo, Mich.; Professor of Botany and Bacteriology, Dean of the College of Science 1927-1929; died June 7, 1929.

⁹ Rev. Francis Joseph Wenninger, C.S.C., born Oct. 27, 1888, at Pamhagen, Austria; Professor of Zoology and Head of the Department of Biology, 1918-1940, Dean of the College of Science from 1923 till 1927, 1929 till his death, Feb. 12, 1940; see also Amer. Midl. Natur. 23 (2): viii pp., 1940.

Let us now consider some of the aspects of the work done in these early days both by students as well as faculty members.

United Scientific Association

The *United Scientific Association*, subsequently known as the *Notre Dame Scientific Association*, was founded on May 12, 1868, with Rev. J. C. Carrier, C.S.C., as President, "for the furtherance of scientific objects." The membership of the association was restricted to "students of the very highest grade." It had three departments, viz., natural history, physics, and mathematics. By Feb. 16, 1869, it had 25 members, 17 of whom were considered active. Its activities included professorial Lectures, debates and lectures by students on scientific subjects, "exploration parties" (now known as field trips). The association also maintained at that time a library of 77 volumes and subscriptions to "three solid scientific periodicals." Its modern equivalent is the *Notre Dame Academy of Science*, founded in 1926 by the late Dean Wenninger. This Academy is likewise restricted to honor students in the College of Science.

Science Museum

In Mr. M. R. Keegan's report of the first commencement at Notre Dame, Aug. 1, 1845, published in the *Philadelphia Catholic Herald* of Aug. 28, 1845, he reports: "But the greatest rush was to the hall occupied by the splendid museum lately purchased by the institution from Dr. Cavalli, of Detroit, who had been collecting it at great expense for many years. It is a splendid collection of beasts, birds, fishes, reptiles, antiquities, etc., from various parts of the globe."

We also know how the Museum was secured. "Father Sorin owned a couple of lots in that city (Detroit) and made a trade with Dr. Cavalli." In 1865 adequate space could finally be provided for the growing Museum which was placed under the care of Father Carrier, its first real curator. Thus Father Carrier may well be regarded as the founder of the Science Museum at Notre Dame. Among other contributions he made himself by his ardent collecting, he encouraged students to collect for the Cabinet of Natural History and Comparative Osteology or the Mineralogical or the Geological Cabinets. While traveling in Europe in 1866 Father Carrier secured a great deal of material for the Museum, for example as gifts the following items: a six-inch telescope presented by Emperor Napoleon III, over five hundred books and twenty large boxes of specimens. In 1876 the Cabinet contained birds, quadrupeds, stuffed and lithographed in colors, native and foreign plants, in excess of 14,000 specimens. Present were also collections of minerals, fossils from "all geological formations," shells, insects and reptiles, eggs and nests, and Dr. Boyd's large collection of skeletons which had been on exhibition at the Inter-State Exposition in Chicago (1877). Father Carrier himself had collected some 8,000 specimens of plants. In 1876 a Mr. Otto, a professional taxidermist as far as the reports go, came from Chicago to supervise the mounting of some of the specimens. Father Zahm,

Curator since 1874, contributed many items collected by himself and solicited from students and friends. By 1878 the Museum was apparently one of the better collections of its kind at that time. Unfortunately, "In the fire of 1879 at the University the entire collection was destroyed, with exception of a single specimen—a mounted wolf—which had been taken out of the museum for renovation."

The rebuilding of the Museum was begun in 1880. Rev. D. Clarke, of Columbus, Ohio, presented the Museum with a collection of minerals and fossils. Former students and friends continued to send specimens to the Museum and additional purchases helped to restore the lost collections. In 1883 Science Hall was built and the Science Museum was transferred to new and spacious quarters in it. It has been there ever since.

Botanical Garden

In the spring of 1867 Father Carrier laid out a little botanical garden west of the old church, and in 1872 he developed a larger garden at the east end of St. Joseph's Lake. It is quite likely that this larger garden was the first real botanical garden developed in Indiana.

Botanical Collections (Libraries and Herbaria)

The first major botanical collection of European plants was given to the University by the French botanist Cauvin, for many years President of the French Institute. Another valuable collection of New Zealand plants, principally ferns, was donated by a missionary, Rev. S. Barthos. This herbarium was augmented with American collections by Father Carrier and later by Father Kirsch (since 1874). By 1877 the herbarium contained between 4,000 and 5,000 specimens. Needless to say, this first herbarium was destroyed in the great fire of 1879.

Meanwhile Father Carrier had left the University but had continued his botanical studies in Canada. His work was publicly recognized by the award of a diploma by the Commissioner of the Chicago World's Fair in 1892, and similarly during the same year for a collection of Canadian plants at the Provincial Exhibition of Montreal. These collections are still largely represented at Notre Dame. Father Kirsch too collected with great ardor and added many specimens to the herbarium. Collections of tropical woods and fruits as well as many cryptogams are still housed in the Museum. After 1904 Father Nieuwland began his extensive botanical studies and built up the collections to an unprecedented level. By now this herbarium contains probably more than 50,000 specimens, many of which were received by exchange or gift. At the same time Father Nieuwland built up his rich botanical library with rare acumen and lasting devotion. This library now contains in excess of 3,000 volumes and is still growing.

A proud acquisition was the gift made to the University by Dr. Edward Lee Greene of his treasured library and irreplaceable herba-

rium. These came to the University in 1914 and, by the terms of the gift, must be kept as separate collections. This library is replete with pre-Linnaean works in botany, many of which are beautifully illustrated or otherwise valuable books. All in all, the library contains more than 4,000 volumes. The Herbarium Greeneanum is one of the most valuable collections largely of western American plants. As it includes the majority of types of the numerous new species of American plants described by Dr. Greene, it is indispensable in any serious taxonomic or monographic work. The herbarium is said to contain about 100,000 specimens.

It is worth mentioning in this connection that the Department of Biology has a third library, mainly of zoological and general biological books and journals. All told, some 10,000 books in all fields of biology are thus available for the reader.

The American Midland Naturalist

Founded in April, 1909, as the *Midland Naturalist* by Father Nieuwland at the suggestion of Dr. Greene, the journal was renamed the *American Midland Naturalist* before the year was out. Under this name it has appeared without interruption ever since. In the early years of its existence Father Nieuwland issued with it reprints of rare works in natural history, viz., all by LeConte and Rafinesque. In 1944 a new supplementary series, known as the *American Midland Naturalist Monograph Series*, was initiated by the author.

Conclusion

Much is being done at the present time to increase the facilities of the Department and to enlarge its scope of teaching in the undergraduate and graduate levels. Well founded on its great tradition and aware of progress in the field, the Department looks forward to greater service to Notre Dame and thereby to the Nation.

Acknowledgements

For assistance in locating references and information the writer is greatly indebted to Mr. Chas. C. Deam, Bluffton, Ind.; to Mr. Paul Byrne, Librarian, and Miss Eileen Conley, Reference Librarian, of the University of Notre Dame.

References

- Annual Catalogues of the University of Notre Dame. 1846-1903.
 Anonymous. 1895—*A Brief History of the University of Notre Dame du Lac, Indiana*. Chicago.
 Bartlett, Harley Harris. 1916—The Botanical Work of Edward Lee Greene. *Torreyana*, 16(7):151-175.
 Britton, L. N., 1873—Botanical Directory for North America and the West Indies. *Bull. Torrey Bot. Club*, 4:49-59. (See p. 55 for Rev. J. Carrier.)
 Bulletin of the University of Notre Dame. 1904----

- Ervin, Robert F., Philip C. Trexler, and James A. Reyniers. 1944—History of Bacteriology at the University of Notre Dame. *Proc. Indiana Acad. Sci.* **53**: 62-65.
- Hope, Arthur J., 1943—*Notre Dame, One Hundred Years*. University Press, Notre Dame.
- Howard, T. E., 1907—*A History of St. Joseph County, Indiana*. Lewis Publishing Co., Chicago. 2 vols. (See vol. 1, p. 530.)
- Just, Theodor, 1936—Rev. Julius Arthur Nieuwland, C.S.C., 1878-1936. *Amer. Midl. Natur.*, **17**(4): xv pp.
- , 1940—Rev. Francis J. Wenninger, C.S.C., 1888-1940. *Amer. Midl. Natur.*, **23**(2): viii pp.
- Kistler, Ellen D., 1936—Bibliography of the Botanical Writings of Edward Lee Greene. *Madroño*, **3**(8): 328-348.
- Lyon, M. W., Jr., 1937—*Father Nieuwland the Botanist*. 7 pp. Notre Dame, Ind.
- Lyons, Joseph A., 1869—Silver Jubilee of the University of Notre Dame, June 23rd, 1869. Chicago. 2nd ed.
- Scholastic Year. 1868-1869—Vols. 1 and 2. Continued as *The Notre Dame Scholastic*, vol. 3, since 1869.
- Wenninger, Francis J., 1937—The Development of the Department of Biology. *Bull. University of Notre Dame*, **32**(4): 26-29.