

## THE MUSEUM OF PALEONTOLOGY

THE Museum of Paleontology had its origin in the Cabinet of Natural History provided for in 1837 at the first meeting of the Board of Regents. The fossils earliest acquired for the cabinet were collected on Isle Royale by Douglass Houghton, the first state geologist of Michigan and one of the first appointees to the faculty of the University.

The early paleontological collections were received as a result of a clause in the act of the state legislature in 1838 creating the Michigan Geological Survey, which provided that duplicate specimens should be deposited at the University. Another and equally important factor in the development of paleontology was the ability and influence of Alexander Winchell.

The Museum of Paleontology at Michigan reflects to a great extent the personalities of three men: Alexander Winchell, 1855 to 1873 and 1879 to 1891; Carl A. Rominger, 1860 to 1907, and Ermine Cowles Case, 1907 to 1941. In the interval between Houghton's death in 1845 and Winchell's appointment in 1855 Abram Sager, who filled the chair of zoology and botany, appears to have been in charge of the paleontological collections. Winchell was the first appointee to the chair of geology after Houghton.

Winchell's published appraisal of the fossil specimens received from the first Michigan Geological Survey indicates his concern for the paleontological collections of the Museum:

They embraced however but a limited number of fossils and most of these were in an imperfect state of preservation. . . . The paucity of fossils in this collection is naturally attributable to two good causes: *first*, the remarkable fewness of fossiliferous out-

crops, especially at that period in our municipal history, and *second*, the nature of the methods by which surveys were prosecuted at that stage of scientific development. (*Report*, 1864, p. 4.)

From sources other than the Geological Survey Winchell records among the principal accessions to the Museum prior to his appointment:

T. R. Chase, Esq., of Cleveland, Ohio, an alumnus of the University, presented a fine collection of coal-plants from the coal mines of northern Ohio; to which he added in June, 1863, a small lot of fossils, finely preserved, from Kelly's Island, Lake Erie.

Prof. Abram Sager, M.D., has given the Museum . . . a magnificent specimen of *Syringopora* from this State. (Winchell, 1864.)

The Cabinet of Natural History was first placed in one of the professors' houses. In 1856 a dormitory room in (old) Mason Hall was remodeled to accommodate the Library and Museum (*R.P.*, 1856, p. 649). Since other collections of the University besides natural history were included in the Museum it was necessary in 1862 to appropriate the North Room of Mason Hall for the Museum. The Library was moved in 1863, providing increased room for the natural science collections. These were moved into the first Museum Building (the present Romance Language Building) when it was completed in 1881. When the Natural Science Building was opened in 1915 the paleontology collections were placed in the basement and first-floor rooms of the Geology Department's section. In 1928 the University Museums Building, at the corner of Washtenaw and North University avenues, was erected, and the Museum of Paleontology was housed in its present quarters on the first floor of the Washtenaw Avenue wing. Provision was made

for two laboratories and classrooms, a preparation room, offices for the curators, and ranges for the collections.

ALEXANDER WINCHELL (1855-91).—Although Alexander Winchell (Wesleyan '47, LL.D. *ibid.* '67) was a man of broad interests and, like most university professors of his time, taught a wide variety of subjects, his chief interest and most important contributions were in the field of paleontology. It is said that as a teacher he was skillful in imparting his own knowledge and in training others to habits of observation and investigation. Besides his many scientific contributions he published a number of popular books on geological subjects. Of these, his work *World Life* (1883) shows the most research and thought and was at that time probably the only book in the English language covering in a systematic manner the entire field of earth history.

One of Winchell's teaching devices and his sense of humor are illustrated by the following story told by a student of the class of 1861:

In the spring in the botany class we had brought in specimens of flowers from a surviving cabbage to a dried-up mullein stalk, and now in the geology class we were to bring in specimens of rocks, each to make his specimen the text for what he knew about geology. A more nondescript assortment of "specimens," before or since, probably never was collected. McG——brought in a chunk of coal; J. C. J——a mosaic set in a finger ring; J. A. P—— a piece of chalk. The range of specimens were all of the same ilk. One boy in particular brought in a piece of putty, and Professor Winchell told him to put it back again in his hat where it belonged. These pranks were in a measure tolerated, and the professor still continued to teach and stimulate as with rare ability. (Utley and Cutcheon.)

In June, 1888, Mary Emilie Holmes received her Doctor of Philosophy de-

gree under Alexander Winchell. She was the first woman to receive a doctorate in geology at the University and the second to receive a doctorate in the University. The members of her committee were Alexander Winchell, J. B. Steere, Henry Sewall, W. H. Pettee, and V. M. Spalding. Her thesis on *The Morphology of the Carinae upon the Septa of Rugose Corals* was printed by Bradlee Whidden, Boston, in 1887. Following the title page is this tribute: "To Prof. Alex. Winchell, L.L.D. in Grateful Acknowledgment of Faithful Instruction, of Judicious Counsel and of Timely Words of Inspiration This Paper Is Respectfully Inscribed by His Pupil."

Winchell was in charge of the Museum from 1855 until the time of his resignation in 1873. In 1864, 1865, and 1866, Carl Rominger (M.D. Tübingen '44) was Assistant Curator of the Museum and was employed to make collections in natural history.

The most notable collections of fossils acquired by the Museum during this period (1855 to 1873) were those from the Michigan Geological Survey under Winchell's direction, the Steere Collection from Brazil and Peru, the C. A. White collection, the Rominger collection, part of the E. A. Strong collection, and the General Custer collection.

The Museum benefited greatly as a result of Winchell's position as state geologist and director of the Survey. Owing largely to his efforts the Geological Survey was re-established in 1859. In his first "Report of Progress," he discusses the successive geologic formations, describes outcrops observed at various localities, and lists the fossils recognized. In regard to the specimens acquired by the Museum, Winchell (1864, p. 9) said: "The products of the survey embrace specimens of rocks and fossils from all the formations occurring south of the Sault Ste. Mary, among

which are very many species new to science—one hundred and fifty of which have recently been described by the writer while descriptions of others are soon to be published.”

With the outbreak of the Civil War, appropriations for the Survey were discontinued and were not renewed until 1869, when the legislature established a Board of Survey with power to select geologists and perform other necessary acts. Winchell was again made Director, and undertook the investigation of the Lower Peninsula, with the assistance of his brother, N. H. Winchell, M. W. Harrington, E. A. Strong, A. M. Wadsworth, C. B. Headley, A. O. Currier, and J. H. Emerson. Carl Rominger was appointed paleontologist on the Michigan Geological Survey in 1871. After Winchell's retirement he was appointed by the board to work on the Lower Peninsula and was assigned a study of the Paleozoic rocks and their associated fossils.

The C. A. White Collection of geological and zoological specimens was purchased in 1863 for \$500. The geological collection consisted of 1,223 entries: 939 American fossils, 63 European fossils, and 16 rocks. Winchell described it briefly as follows: “This collection is remarkable for two things: 1st, the large number of beautifully preserved crinoids which it contains, and 2nd, the number of its original or type specimens. The fossils in this collection probably double the number previously in the possession of the University.” Charles A. White, of Burlington, Iowa, had in 1860 described in considerable detail the rocks and their included fossils in the vicinity of Burlington. He was state geologist of Iowa from 1866 to 1869 and subsequently was paleontologist on surveys of the federal government and with the National Museum. He donated several other collections of fossils to the Museum

subsequent to the sale of his original one.

The General Custer and Steere collections were received in 1873. The former consists chiefly of Upper Cretaceous fossils from the Yellowstone and Musselshell valleys. Winchell recorded that the Steere Collection included 77 entries of fossils and 1,068 specimens. The E. A. Strong Collection was acquired in several installments. Mr. Strong was superintendent of the public schools in Grand Rapids and was later head of the Department of Physics and Chemistry in the State Normal School at Ypsilanti. As noted above, he assisted Winchell on the Michigan Geological Survey in 1869. Winchell's report of 1873 on the Museum contains the following entry in the list of accessions: “Prof. E. A. Strong, Grand Rapids. Upper Helderberg Fossils—15 entries, 32 specimens, from Onondaga County, N. Y.” Shortly after Strong's death in 1920, the Museum secured from his daughters a collection of fossils containing specimens that had served as the basis for a paper Strong published in 1872.

After Winchell's first period on the faculty, the paleontology collections were under succeeding professors of geology, who usually also held the chairs of zoology and botany. Winchell was succeeded in 1873 by E. W. Hilgard, who resigned in 1875, and W. H. Pettee took charge of the geological work. Their time was taken up largely by teaching duties and the Museum was mostly under the direction of Mark W. Harrington, who was Instructor and Assistant Professor of Geology, Zoology, and Botany from 1872 to 1876.

In 1876 Joseph Beal Steere was appointed Assistant Professor of Paleontology and Curator of the Museum. This was the first time that paleontology had been officially recognized apart from geology in a University title. That year a course in paleontology was offered for

seniors in the Polytechnic School. In 1879, when Winchell was reappointed to the faculty as Professor of Geology and Paleontology, Steere was promoted to Professor of Zoology.

In 1883 the Regents authorized the purchase of a mastodon head found in Ohio, at a sum not exceeding \$115 and stipulated that it was to be deposited in "the General Museum building."

The activities of the Museum staff in the field of paleontology after Winchell's return to the University are summarized briefly in several of President Angell's annual reports. In 1883 he said: "The paleontological specimens are arranged in biological order. During the year the whole collection of fossil plants has been investigated and arranged. A few valuable gifts have been received. Cases are needed for some of the largest specimens, which are suffering from exposure" (*R.P.*, 1881-86, p. 394). The following year he noted: "A few additions have been made to the Museum of General Geology and Paleontology. But it is very desirable that we have the means of making additions, especially of vertebrate remains, to our collections. Large supplies of desirable specimens are found in our western territories. For the lack of these our special students are suffering seriously in the prosecution of their work here." In the annual report for the year ending September 30, 1885, it is recorded that "in the palaeontological department the entire collection of the proboscidian remains have been investigated, arranged and labeled by Dr. Winchell, and much work has been done by him in a careful study of the difficult group of the stromatophoridae. A large part of our specimens have been better arranged and labeled, and the larger part of Dr. Rominger's valuable collection has been received on deposit. It is greatly to be desired that this collection should be permanently secured for the

University" (*R.P.*, 1881-86, p. 604).

To Winchell is given the credit for organizing the Museum as a distinct department. He originated the first system of catalogues, including two for geological and paleontological accessions: (1) a Journal in which are entered the date of every acquisition, its nature, and the source whence obtained; (2) a Geological Register in which the names of specimens are written opposite the serial numbers extending from one upwards, and opposite these the locality, formation, source of acquisition, date of acquisition, collector, and place in the Museum of each specimen. He inaugurated the custom of submitting annual reports to the Board of Regents. Several of these were published separately, and others are in the *Regents' Proceedings*. They are among the principal sources of information on the development of the Museum. Winchell served as secretary of the Board of Regents from 1854 to 1856.

When first appointed to the faculty in 1853, Winchell was Professor of Physics and Civil Engineering. In 1855 his title was changed to Professor of Botany, Zoology, and Geology. Among the many courses he offered there were several in paleontology. Winchell's earliest publication in Michigan paleontology, dealing with fossils from the Marshall sandstone, appeared in the *American Journal of Science* in 1862. During his first period of tenure on the faculty, he published some twenty papers on the geology and paleontology of Michigan.

After Winchell's death, a course in General Paleontology was offered by Israel C. Russell, Professor of Geology from 1892 to 1906. H. E. Sargeant was appointed part-time Curator in the Museum in 1898. He was succeeded in 1903 by Charles C. Adams, who served until 1906, when Ruthven became Curator. Ruthven continued in that capacity un-

til 1913, when the name for the collections of zoology and anthropology was changed to the Museum of Zoology, and his title became Director of the Museum of Zoology.

CARL LUDWIG ROMINGER (1861-1907).—Although Carl Ludwig Rominger was officially connected with the Museum as Assistant Curator for only two years (1864-66), his industry in and devotion to paleontology left an indelible impression on the progress of that science in the University and in the state. He lived in Ann Arbor for forty-seven years and was state geologist of Michigan from 1870 until 1884.

His contributions to the Museum were made in several ways. His collection of invertebrate fossils from Europe was acquired by the Museum, he donated several other collections made in this country, he studied the corals of Michigan which became the property of the University, he collected for the Museum, and after his death his son and daughters presented his papers and several boxes of fossils.

The acquisition of the Rominger Collection by the Museum is a lesson in patience and perseverance. A contemporary paleontologist (Clark, *Hall*, p. 453) characterized Rominger as "a gentle, keen, generous and obstinate geologist with abilities of a high order. . . ." Rominger seems to have wanted his collection to be in Ann Arbor where he could work on it, yet be needed whatever money it would bring. At a meeting of the Board of Regents on March 29, 1864, "President Haven announced that Dr. Carl Rominger had offered to place in the University Museum a very choice collection of fossils from Europe, provided that the Regents would furnish suitable cases for the arrangement of the same." The following day the Committee on the Museum having seen the specimens reported that

it was a very valuable collection and "having ascertained the Doctor's willingness to let them remain in the University a number of years, recommend that the same be received subject to the direction of the President."

At the September, 1864, meeting of the Board of Regents, Haven said:

Several cases have been made to receive a large and excellent collection of fossils, gathered in Europe, by Carl Rominger, M.D., Assistant Curator of the Museum of Geology, Zoology and Botany. The University has the use of this rich and rare collection now gratuitously, and I recommend that it be purchased, if it can be for a reasonable price, and made a permanent part of the Museum.

Four years later, in a report to the president Winchell wrote: "I beg respectfully again to call attention to the Rominger Collection. In courtesy to Dr. Rominger some definite action should be taken without further delay."

At the next meeting of the Regents, on December 22, 1868, the following resolution was adopted: "*Resolved*, That this Board heartily appreciates the value of Dr. Rominger's Collection of Fossils now in the University Museum, and that it is very desirable to secure the same for the University as soon as the state of our finances will permit."

After another year the committee recommended "the purchase of Dr. Rominger's Collection, at the price named, \$1,500, and that such terms with regard to time of payment be made as can be agreed upon." This report was adopted. However, nine years later in 1888 the committee was authorized to enter "into a contract with Dr. Rominger, by which, on payment semi-annually of one hundred and twenty-five dollars (\$125) from January 1st, 1888, by the University to Dr. Rominger, the latter binds himself to keep his palaeontological collection in the University

Museum; and not to sell it without giving us one year's notice. The University may at any time terminate the leasing of the collection and may purchase the collection at any time for a sum not exceeding five thousand dollars."

In December, 1891, the motion was carried to authorize the Executive Committee to purchase the Rominger Collection for \$5,000, and in January, 1892, it was reported that Rominger's collection had been purchased. The committee believed that the price was very low and concluded that the Museum's paleontological collections had been "doubled in amount and trebled in value as a result of Dr. Rominger's collection. It contains collections from this country and Europe. . . . A valuable suite of Canadian trilobites at present being studied in Washington by the U.S.G.S. is to be included, also Russian bryozoa, from which several hundred thin sections have been prepared." The Rominger Collection in 1866 contained 2,500 entries and 6,000 specimens (*R.P.*, 1866, pp. 168-80). Thus, after twenty-eight years' delay, title to the Rominger Collection passed to the University of Michigan.

As state geologist for fourteen years Rominger prepared his most lasting contribution to the geology and paleontology of Michigan. In Volume III of the Survey publications, Part I is devoted to the "Geology of the Lower Peninsula" and Part II to the "Fossil Corals." He emphasized the faunal assemblage characteristic of successive strata and concluded that "in the fossils we have always an infallible guide, in cases where lithological and stratigraphical characters would leave us in an inextricable perplexity, regarding the position of certain strata." The assemblage of fossil corals gathered by Rominger to illustrate his work is probably the finest collection of this group

of organisms from the Devonian of North America.

In a letter of 1878 (Clark, *Hall*, p. 453) Rominger described his simple but productive mode of working, as follows:

In the quiet way I prosecute my work, with small expense to the State, I find no opposition and everybody lets me go my own course, but I think the case would be different as soon as I would claim assistants and increase of appropriations. Fortunately I do not believe that with assistants I could work more successfully than I do at present, therefore I need no larger appropriations and have in all things my own way, not to the disadvantage of the State.

Rominger moved to Ann Arbor in 1860, and the first record of his connection with the Museum is in 1861 when "on motion of Regent Johnson the sum of \$75 was appropriated to pay Dr. Rominger for services rendered in the Museum" (*R.P.*, 1861, p. 967). Winchell's report to the President for the year 1864-65 records the accession from Rominger of a small lot of fossils, supposed to be from Rockford, Illinois.

On June 27, 1865, the Regents received a communication from Winchell, "in relation to the enlargement and improvement of the Museum and the employment of Dr. C. Rominger as Curator of the Museum of Geology, Zoology and Botany, to be charged with the duty of laboring for the increase and preservation of the collections in this department." Rominger continued as Assistant Curator, however, but his salary was increased to \$200 per annum. A sum of \$300 was appropriated "for the purpose of employing Dr. Rominger to make collections in Natural History for the use of the Museum, in accordance with the plan proposed by Dr. Rominger in his paper, and to be approved by the President and Professor Winchell" (*R.P.*, 1865, p. 123). With this sum he made twelve collections, comprising 320

species of fossils from Ordovician, Silurian, Devonian, and Mississippian strata in Indiana, New York, Michigan, and Ontario. Nevertheless, in September, 1866, the Committee on the Museum recommended that his salary as Assistant Curator of the Museum be discontinued.

Rominger's distinction brought many prominent geologists and paleontologists to Ann Arbor. His collections of European and American invertebrates are still among the best in the Museum of Paleontology. They have furnished the basis for numerous studies by succeeding investigators.

ERMINE COWLES CASE (1907-41).—The development of vertebrate paleontology at the University of Michigan began with the appointment of Ermine Cowles Case (Kansas '93, Ph.D. Chicago '96) as Assistant Professor of Historical Geology and Paleontology in 1907. Winchell and Rominger had been interested primarily in invertebrate fossils, which occur in great numbers in the rocks of Michigan, but Case was trained in vertebrate paleontology. Vertebrate fossils are relatively rare in Michigan so that under his influence the emphasis changed not only from invertebrate to vertebrate paleontology but also from the fossils occurring in Michigan to those of the western and southwestern United States.

The vertebrate fossil collections of the Museum grew rapidly by Case's untiring efforts. In his laboratory he was constantly engaged in preparing and studying specimens. He led field parties in the West and Southwest nearly every summer, collecting for the University some of the finest specimens of Triassic amphibians and reptiles to be found in any museum in the world. Although early amphibians and reptiles were his chief field of interest, his researches included many other groups of animals which ranged in age from Devonian to Pleistocene. Fishes from Michigan,

Pennsylvania, and Texas, turtles from Montana and Wyoming, birds from South Dakota, and mammals from Michigan and Maryland received his careful study.

Many of the vertebrate specimens were prepared for study or exhibit by William H. Buettner, vertebrate preparator in the Museum from 1915 to the present. He accompanied Professor Case on most of his collecting trips to the western United States from 1917 to 1938. His first preparation room on the campus was in the basement of the old Pharmacology Building, but he subsequently moved in October, 1915, to a room in the basement of the Geology section of the new Natural Science Building. One of Buettner's first jobs was to help move the Geology Department to the Natural Science Building. As he was crossing the campus, carrying the relief globe of the world on his shoulder, he passed President Angell on the walk. The President stopped and remarked: "You must be a very strong young man to carry the world on your shoulders."

In 1911 Professor Case had "Curator of the Paleontological Collection" added to his title. He was promoted in 1912 with the title Professor of Historical Geology and Paleontology. In 1921 he succeeded William H. Hobbs as Director of the Museum of Geology (changed to Museum of Paleontology in 1928).

Under Case's leadership the teaching of paleontology expanded with the growth of the University. George M. Ehlers ('13, Ph.D. '30) was appointed Instructor in Geology in 1919. He developed courses in invertebrate paleontology.

The Museum of Geology first had a separate budget in 1926-27. The staff in that year consisted of E. C. Case, Director, W. H. Buettner, Preparator, M. S. Chang, Assistant, and Mary E. Cooley, Cataloguer. When the name was changed to Museum of Paleontology

and the collections were moved to the Museums Building the staff consisted of Professor Case as Director and Curator of Vertebrates, Assistant Professor G. M. Ehlers as Curator of Paleozoic Invertebrates, and Mr. W. H. Buettner as Preparator. It was soon augmented however by the appointment of Lewis Burnett Kellum (Johns Hopkins '19, Ph.D. *ibid.* '24) as Curator of Mesozoic and Cenozoic Invertebrates in 1928 and Chester A. Arnold (Cornell '25, Ph.D. *ibid.* '29) as Curator of Paleobotany in 1929. With the exception of Arnold, who was on half time in the Botany Department, the salaries of the curatorial staff were entirely on the Geology Department budget.

Among the first vertebrates placed on exhibit in the Museum after Case was appointed to the faculty were three skulls: the giant beaver, *Castoroides ohioensis*, a large carnivorous reptile, *Dimetrodon incisivus* Cope, and a huge amphibian *Eryops megacephalus* Cope, of the early ages of the world. The beaver skull mount was assembled from two specimens found at different places in Michigan. The reptile skull was part of a collection made by Case from the Permian of Texas in 1908 on a co-operative expedition of the Department of Geology and the American Museum of Natural History. The amphibian skull was collected in the same area at another time. Another exhibit installed about the same time was a series of bones and teeth illustrating the evolution of the horse. The specimens were obtained on exchange from the American Museum.

In 1911 Case wrote: "The department of geology is making extensive plans to continue the collection and installation of vertebrate fossils in the Museum, a phase of geological work in which the University is far behind other institutions."

In the summer of 1912 Case dis-

covered the Brier Creek Bone Bed in Archer County, Texas. It contained "by far, more bones than any known accumulation of the same age." More than 1,500 specimens of separate bones were recovered, and many times that number were present. That year the Board of Regents added \$300 to the budget of the Department of Geology "to cover the salary of an assistant giving ninety hours per month for ten months to the preparation of vertebrate fossils collected by the expedition in charge of Professor E. C. Case during the past summer."

Among the many specimens collected from the Brier Creek Bone Bed the following summer (1913) there were several basicranial regions of the Permian or Permo-Carboniferous reptiles, *Dimetrodon* and *Edaphosaurus*. Also numerous large foot bones of a character different from those of *Dimetrodon* or the cotylosaur *Diadectes* were found associated with the spines of *Edaphosaurus* and with large claws. From this Case concluded that "the foot of *Edaphosaurus* was of goodly size and armed with sharp claws well fitted for digging in the soft earth or vegetation, tearing open rotten logs and overturning rocks in search of food." A composite mount of the skeleton of *Edaphosaurus cruciger* Cope was subsequently made from bones of various individuals of the same size all recovered from the Brier Creek Bone Bed.

Also from the very abundant material collected from the Brier Creek Bone Bed sufficient bones of the right size were selected to mount a nearly complete skeleton of *Dimetrodon incisivus* Cope, the "fin-backed lizard."

Three specimens of exceptional interest and value were presented to the University by Chase S. Osborne in 1914: an egg of the extinct, giant, flightless bird of Madagascar, *Aepyornis*



*maximus*; a skeleton of the extinct pygmy hippopotamus from the Pleistocene deposits of Madagascar; and an adult specimen of the common hippopotamus of South Africa shot by Mr. Osborne while hunting. Mr. Osborne obtained these specimens on a trip around the world in 1913.

From the bluffs along the north side of Chaleur Bay, New Brunswick, the Museum obtained in 1916 the little armored fish called *Bothriolepis*, so ancient that it is doubtful whether it can really be called a fish. It lived in the Devonian period some 300 million years ago, almost at the beginning of backboneed life. From these ancient rocks Case collected specimens of the air-breathing lung-fish, ancestor of one of the most persistent of the lines of life upon the earth. Its descendants live, but little changed, in the waters of western Australia, Egypt, and Paraguay today.

The University of Michigan expedition to the Bad Lands of South Dakota in 1917 recovered an excellently preserved shell of the large land turtle *Stylomys nebracensis* Leidy, the skull of a great browsing animal, Titanotherium, which took the place of the elephant in those older days, the skull and a part of the skeleton of one of the ancestral pigs, as large as a small pony, and probably one of the most terrible animals of the period. While examining the Triassic Dockum beds of western Texas in the summer of 1919, Case collected the almost complete thoracic shield of a large labyrinthodont, which he described and figured as a new species.

Another remarkable specimen was collected in 1917 and 1919 near the crossing of the Blanco River on the road from Spur, in Dickens County, to Crosbytown, in Crosby County, Texas. It consisted of the skull, most of the vertebral column, much of the dorsal armor and a

curious pair of curved spines, belonging to a new phytosaurian reptile, near the ancestral crocodile. Case described and figured it under the name *Desmotosuchus spurensis*. A glass case was built especially to exhibit it.

In 1920 Case discovered an amphibian skull in the breaks of Sand Creek in Crosby County, Texas. The undistorted skull was unique in the perfect preservation of the bones and the minutiae with which the osteological details could be traced. He named it *Buettneria perfecta*.

The Museum also acquired in 1920 a tooth of the Dipnoan genus *Ceratodus* which is of special scientific interest as the first occurrence of the genus recorded in North America. Case discovered it in the Dockum beds of Crosby County, Texas. It was the only fish tooth found in a collection of several hundred teeth. He and Buettner also brought back the major part of the presacral part of the vertebral column of a small dinosaur. The bones were in their natural position, but had been somewhat crushed and rotted before fossilization. In the laboratory they were mounted on a plaque just as they occurred in the rock.

In a survey of the paleontological collections in the University in 1921, Case said:

The paleontological collections in the Museum of the department of Geology have been gathered to illustrate the history of the earth and the origin and development of life. . . . The collections have steadily grown since their start by purchase, by exchange, by gift and by continued collection. . . . One of the most important steps in advance was the institution, some ten years ago, of expeditions by members of the department, directed to definite localities with the object of procuring material to fill gaps in the series and obtain material for student use. (*Mich. Alum.*, 27: 292.)

From the great tar pits of Rancho la Brea near Los Angeles, California, the

University obtained a great wolf and the skeleton of one of the sabre-tooth tigers. A specimen referred to the amphibian genus *Ostodolepis* was obtained on exchange from the University of Chicago about 1912. It was enclosed in a nodule of hard calcareous red sandstone which required more than a month's time of chiseling with a needle under a binocular microscope, to extricate. Case identified it as *Ostodolepis brevispinatus* Williston and stated that in all probability it came from the same locality and geological horizon as the type specimen which was also contained in a block of red sandstone from Wilbarger County, Texas.

The party from the Museum in the summer of 1924 collected an incomplete skull of an Eocene crocodylian from the lower beds of the Wasatch formation of Tatman Mountain in the Big Horn Basin, Wyoming. It is particularly valuable in that it preserves the major part of the dentition. Case described it as *Allognathosuchus wortheni*.

In the following year (1925) Case and Buettner returned to a locality in Crosby County, Texas, where they had collected in 1920. Buettner discovered there a nearly complete pelvis of a large phytosaur with only the right ilium missing. In preparing and mounting the specimen in the laboratory, they discovered that the right ilium found on the earlier expedition fitted exactly into the otherwise complete pelvis. The association of the skull found in 1920 and pelvis added considerably to their scientific value.

The 1927 expedition to Texas was especially rich in the museum specimens recovered. The first member of the reptilian order Cotylosauria known to occur in the Triassic of North America was found by Buettner near Walker's Tank in Crosby County. Professor Case named it *Trilophosaurus buettneri*. The

specimen is the anterior part of the lower jaw of a small cotylosaur. On the same expedition Case and Buettner collected a very complete cranial region of a large phytosaur, probably of the genus *Leptosuchus*, from the Upper Triassic beds of Howard County, Texas.

In April, 1928, in Case's first published account of the expedition to Texas in 1927 he referred to it as "the expedition of 1927 from the Museum of Geology," but in November, 1928, he spoke of it as "the expedition from the Museum of Paleontology." The title of the Museum of Geology was changed in May, 1928, to Museum of Paleontology.

Near Ostischalk, about twenty-three miles southeast of Big Springs in Howard County, the 1927 expedition recovered an almost complete skull, lacking the jaws, of a new form of phytosaur, *Brachysuchus megalodon*. In 1929, he and Buettner revisited the site and found, within 100 feet of the spot where the skull had been recovered two years before, the nearly complete lower jaw of the same specimen.

The 1931 expedition to Scurry County, Texas, recovered a large amount of material of the stegocephalian, *Buettneria bakeri*, which later was used for teaching, research, and exhibit in the Museum. In Potter County the field party recovered two nearly complete skulls of phytosaurs, *Leptosuchus studeri* Case and *Brachysuchus megalodon* Case, and a large part of the tail of a small dinosaur of the genus *Coelophysis*.

One of the most valuable specimens in the Museum is the skull of the reptilian dicynodont *Kannemeyeria erithrea* Haughton, collected by Henry F. Donner in 1931 from the Permian of South Africa. Donner, a student assistant at the University's astronomical observatory at Bloemfontein, had been commissioned by Case to collect fossils from some of the well-known vertebrate

localities in South Africa. His account of the circumstances under which he found this specimen follows:

Upon arriving at Lady Frere I learned that a German was there collecting for the University of Munich and had been there for over two weeks. I thought there would be no hope for me and decided to leave the next day. In the P.M. however, my Friend in Lady Frere and I went to look around in a small hill about a mile from town where he had found many bone fragments. Here we noticed a little knob of rock about the size of a golf ball. I chipped the top off with my pick and saw bone which I took to be the snout. I had pleasant visions of a nice skull behind this and behind the skull a beautiful skeleton buried under the hill. We started digging away around it and the more we dug the more it looked like a skull so we hurried back to the house to get more tools and a Native boy and by dark had the nice big skull removed. The next morning I returned with the boy and we dug all about the spot but found no more so had to be content with collecting all the bone fragments scattered about the spot which probably belong to the skull. A few hours after we left the German arrived at the spot and learned that he was not the only one collecting. Later I met him and he showed me his collection which I envied very much. When I showed him my skull he was very disappointed that I had arrived. He said it was the best one he had seen and if I had only waited a day longer he would have had it as it was the only place he had not visited. This luck encouraged me so I stayed a few days but only found a tooth in this same hill and a bone about one mile north of this spot.

The skull of a new fossil hawk from the Oligocene beds of South Dakota was the most important find of the 1932 expedition from the Museum of Paleontology. Another fortunate discovery of this season was a specimen of the land turtle *Stylemys* with the bones of the feet, most of the limbs, the girdles, the neck, and the tail preserved.

In the summer of 1933, a joint expedi-

tion from the Museum of Paleontology and the Museum of Comparative Zoology spent some weeks in the Permian-Carboniferous beds of north-central Texas. In the course of the work, Buettner discovered a slab containing sixteen skulls of the amphibian *Trimerorhachis*. In the laboratory seven were removed, four of these were sent to the Museum of Comparative Zoology and three were used for detailed study. The balance of the slab was placed on exhibit. Near Dundee, in Archer County, Buettner collected the remains of many small fish from the Permian, Wichita formation. By piecing the fragments together, Case was able to reconstruct the skeleton. It proved to be a new paleoniscid fish, *Eurylepidoidea socialis*.

It is always a satisfaction to recover an anatomically complete skeleton of a form that has previously been known only from fragmentary material. Such good fortune came to the expedition from the Museum in 1938 when a nearly complete turtle skeleton in the Upper Cretaceous, Lance beds, near Fort Peck, Montana, was found. The party was engaged in the excavation of a dinosaur when a visitor, Mr. Ralph Nichols, of Salmon, Idaho, discovered a turtle in a sand deposit approximately 100 feet above the bed in which they were working. Case subsequently identified it as a species of the genus *Eubaena*.

The summer of 1938 was the last of Case's expeditions in search of fossils. That summer the Museum's field party, consisting of Case, Buettner, and John A. Wilson, collected the great semi-aquatic dinosaur, *Anatosaurus* (previously called *Trachodon*), which was to become the most spectacular exhibit in the Hall of Evolution in the Museum. It was found in the Hell Creek beds of Upper Cretaceous age near Fort Peck, Montana. The removal of the bones took two months, and more than four tons

of material was shipped to the Museum. It took three years of Buettner's time in the laboratory to prepare and mount the specimen for exhibit.

Numerous vertebrate fossils from Michigan were brought to the Museum of Paleontology during the Case period. Nine mammoths (two from Eaton County and one each from Newaygo, Livingston, Montcalm, Lenawee, Cass, Ionia, and Wayne counties), and fifteen mastodons (three from Berrien County, two each from Lenawee and Jackson counties, and one each from Washtenaw, Eaton, Monroe, St. Joseph, Shiawassee, Genesee, Wayne, and Saginaw counties) were received. In August, 1915, the Museum acquired a nearly complete skull of the extinct musk ox *Symbos cavifrons*. It is the most perfect skull of the fossil musk ox in existence. The specimen was found about three miles northeast of Manchester, Michigan. Specimens of armored fish of Devonian age were collected in 1930 at Rockport in Alpena County. The subocular plate of another Devonian arthropod, *Dinicthys*, from Squaw Basin, in Alpena County, was given to the Museum in 1933. Remains of a Pleistocene horse (*Equus*) found in Reety Park in Manistee were purchased in 1934.

As a result of the geologic expeditions under the direction of L. B. Kellum, the Museum received large collections of invertebrate fossils from Mexico during this period. The Museum also acquired by gift three other important collections from Mexico: the East Coast Oil Company Collection in 1928, the Ohio-Mexico Oil Company Collection in 1933, and the Barker Collection of Foraminifera in 1937.

Other collections which should be mentioned either because of their size or the perfection of preservation or the rare occurrence of the specimens, are: the Day Collection, purchased before

1928; the Ford-Mitchell Collection of Recent and fossil crania and teeth, transferred from the Dental School to the Museum of Paleontology in 1928; the Hinshaw Collection, given to the Museum between 1926 and 1931 by H. H. Hinshaw of Alpena, Michigan; the Stuart Perry Collection, given to the Museum in 1931 by Stuart H. Perry of Adrian, Michigan; the Elliott Collection given by Mr. William J. Elliott of Spur, Texas, between 1934 and 1947; the Pettyes Collection, purchased in 1936; and the Gilbert O. Raasch Collection, purchased in 1938.

The series, *Contributions from the Museum of Geology*, was inaugurated in 1924 to provide a medium for the publication of papers based upon material in the Museum. The name of the series was changed in 1928 to *Contributions from the Museum of Paleontology*. Case was largely responsible for starting the new series. He and other members of the Geology Department had earlier published papers based on specimens in the Museum in the *Occasional Papers of the Museum of Zoology*, in *Papers of the Michigan Academy of Science, Arts, and Letters*, and in scientific journals outside the University. The series was financed at first by the Graduate School. In 1938 the Committee on Scholarly Publications assumed this responsibility.

THE PERIOD SINCE 1941.—Since 1940 the Museum of Paleontology has been reorganized on a basis to promote its functions in the University. There has been continued growth of the collections, expansion of the staff, increase in the number of courses offered, a broadening and change in emphasis of the research program. Installation of public exhibits in paleontology has been transferred to the Section of Exhibits in the University Museums. Control of publication of the *Contributions from the Museum of Paleontology* has been placed in the hands of the

director and curatorial staff of the Museum. Field work has been established on a more continuing basis. In fourteen years, 10,770 catalogued items have been added, making a total of 33,040. Many thousands more have been accessioned and await study before being catalogued.

Upon the retirement of E. C. Case in 1941, L. B. Kellum was appointed Director of the Museum of Paleontology. The same year, the Board of Regents recorded and approved the transfer of the Museum of Paleontology from the Department of Geology in the College of Literature, Science, and the Arts, to a status similar to that of the other University museum units. Members of the Museum staff teaching in the Geology Department were placed on half time in the Museum and half time in the Department, thus clearly defining their responsibility to the curatorial and teaching functions. In September, 1941, Joseph Tracy Gregory (California '35, Ph.D. *ibid.* '38), a member of the staff of the Texas Bureau of Economic Geology, was appointed half-time Curator of Vertebrate Paleontology and half-time on the teaching staff of the Geology Department. Like that of E. C. Case his work had been on Permian and Triassic fossils in Texas. After one year he was drafted into the armed forces and was on leave from August, 1942, to April, 1946. After resuming his teaching and curatorial duties he resigned in June to accept an assistant professorship at Yale University. The vacancy thus created was filled in 1946 by the appointment of Claude William Hibbard (Kansas '34, Ph.D. Michigan '41) as Assistant Professor of Geology and Associate Curator of Vertebrate Paleontology. Hibbard's training and experience had been chiefly in late Cenozoic mammals. His research activities have continued mainly on Cenozoic stratigraphy and paleontology of

the High Plains. His annual field trips to western Kansas and adjoining states have added an enormous number of small vertebrates and some larger ones to the Museum's collections. Many publications by Hibbard and his students have resulted from the study of this material. He was promoted to Curator in 1949.

William G. Fargo, of Jackson, Michigan, was made Honorary Curator of Paleozoology in 1943, in recognition of his work on the Pliocene Mollusca of Florida and his continued interest in and co-operation with the Museum. He identified the Museum's large collection of marine Pliocene Mollusca from the Caloosahatchee formation of Florida and deposited in the Museum many identified specimens from the St. Petersburg fauna. Mr. Fargo was the only honorary curator in the Museum of Paleontology.

The appointment of Erwin Charles Stumm (George Washington '32, Ph.D. Princeton '36), Associate Curator of Paleozoic Invertebrates, on a full-time basis in July, 1946, reflected a new policy of the University with regard to the Museums. The creation of the Advisory Board of the University Museums in 1945 had brought into the administration of the Museums a new group of University officers. They rejected the older theory that each division of the Museums should have a single curator, with an assistant of transient employment, and proposed that the Museums should offer a truly professional career to the members of the staff. Stumm's appointment was the first full-time academic appointment in the Museum of Paleontology. His research on the Museum's collections was chiefly on Paleozoic invertebrates from Michigan, including brachiopods, cystoids, trilobites, and corals. He was promoted to Curator of Paleozoic Invertebrates in 1952. Ehlers

and he published a number of papers on the corals of the Traverse Group in Michigan. They figured and redescribed many type specimens in the Winchell and Rominger collections.

With the growth of the oil fields of Michigan there developed a need for geologists trained in micropaleontology who could recognize, by means of their fossil content, the formations penetrated by the drill and determine the depths to possible producing horizons. In response to this need and to promote the development of the natural resources in the subsurface of the state, Robert Vernon Kesling (Ph.D. Illinois '49) in 1949 was appointed Associate Curator in the Museum, half-time in the Museum and half-time as Assistant Professor in the Geology Department. Kesling's field of specialization was the subclass Ostracoda of the Crustacea. He built up the Museum's collections in this group of organisms, and his research led to the discovery of many new species and genera. His many publications on the Ostracoda of Michigan are exquisitely illustrated with his own line drawings and superb photography. He was promoted to Curator of Micropaleontology in 1955.

Professor Emeritus E. C. Case continued his research in the Museum for nearly ten years after his retirement. In this period he completed a monograph on the Stegocephalia, published a paper on the parasphenoid bone in the vertebrate skull, and prepared a catalogue of the type and figured specimens of vertebrate fossils in the Museum of Paleontology. His final publication, entitled "The Dilemma of the Paleontologist," appeared in 1951. In it he explained that the contribution of the vertebrate paleontologist to the study of evolution is limited by the fact that only the hard parts of animals are ordinarily preserved in fossils and that the preservation of even these parts is imperfect. He might well have considered his own contribu-

tions to the stratigraphy and paleoecology of the past, where the paleontologist is on much firmer ground and where he has obtained more substantial and lasting results.

During this period the Museum received some notable collections. In 1940 the Hood Museum transferred to the Museum of Paleontology a large collection of invertebrate fossils which Alexander Winchell or his heirs had sold to Alma College. With it were two catalogues in Winchell's handwriting. Among the items listed were fossils collected by E. A. Strong at Taylor's Quarry, Grand Rapids, Michigan, in 1871, and at Wilmington, Illinois; fossils collected by Rominger at Widder, Canada West, in 1865; and fossils collected by C. A. White at Burlington, Iowa, and elsewhere. The great majority of the specimens, however, had been collected by Winchell himself.

Besides the large collections of fossils made by the curators during their own field investigations, the Museum received by gift, exchange, and purchase many others, including a skeleton of *Rhynchosaurus* from the Triassic of southern Brazil, secured in 1942 on exchange from the Museum of Comparative Zoology; several collections of identified marine mollusks from the Pliocene and Miocene formations of Florida given by William G. Fargo, of Jackson, Michigan; in 1944 the collections of Roy L. Coville, a former student of the University of Michigan and former head of the Industrial Arts Department of the State Teachers College, Dickinson, North Dakota, consisting of well-preserved fossil plants and vertebrate animals from the Bad Lands of western North Dakota. In 1944 the Museum purchased four large silicified cycadoids from the Lower Cretaceous of Texas.

Vertebrates from Michigan are especially important records. Those acquired since 1940 include the remains of five

mammoths (from Midland, Lenawee, Barry, Washtenaw, and Shiawassee counties) and ten mastodons (three from Shiawassee County, two from Berrien County, and one each from Livingston, Genesee, Sanilac, Washtenaw, and Lenawee counties).

Other collections acquired in this period, which should be mentioned, are: the Raymond R. Hibbard Collection received by exchange between 1927 and 1954; the Southworth Collection purchased between 1935 and 1947; the Humphrey Collection, the gift of William E. Humphrey, between 1940 and 1954; the Reimann Collection, the gift of Irving G. Reimann, between 1947 and 1953; and the E. P. Wright Collection, given between 1952 and 1954 by Mr. and Mrs. Edward Poultney Wright of Grosse Pointe Farms, Michigan.

The Hall of Evolution in the University Museums Building is devoted almost entirely to paleontological exhibits. The planning, preparation, and installation of these were the responsibility of the Museum of Paleontology prior to 1947, when Irving G. Reimann was appointed Prefect of Exhibits in the University Museums. The great duck-bill dinosaur skeleton collected in 1938 was installed in 1940-41. A large and beautifully preserved ammonite, *Placentiaceras meeki* Boehm, from the Cretaceous of South Dakota, was made a complete exhibit in 1941-42. The pelvis of a dinosaur collected by the American Museum of Natural History in Wyoming was given to the University in 1939 and displayed in 1942-43. An exhibit of Oligocene insects in Baltic amber was also planned and installed in that year. A titanotheres exhibit occupying two sec-

tions of the vertical cases was arranged in 1943-44. It consisted of a skull collected by Case in 1917 from the Bad Lands of South Dakota, a lower jaw from Wyoming received on exchange from the American Museum of Natural History, a complete pelvis collected near Orella, Nebraska, in 1936, and a small-scale restoration of the animal made by the Museum's artist.

The vertical mount of the Owosso mastodon which had been in preparation since 1944, was placed in the center of the hall in 1946-47. The Alcove of Fishes and the Alcove of Fossil Plants were completely rearranged by curators in the Museum of Paleontology in 1946 and 1947.

The principal change in the exhibits, which began in 1947, was the use of dioramas to show the animals as they appeared in life and the use of color to make exhibits more attractive. This reduced the space available for fossils on exhibit, and few actual fossilized specimens have been installed in the last eight years.

Prior to his retirement Professor Case was the sole member of the Editorial Board of the *Contributions*. In 1942 President Ruthven, on recommendation of the Committee on Scholarly Publications, appointed G. M. Ehlers, C. A. Arnold, and L. B. Kellum, chairman, members of the board. There has been no change in the membership since. In 1952 the Committee on Scholarly Publications was relieved of all responsibility for the *Contributions*, and funds for publication were appropriated by the Board of Regents to the Museum of Paleontology.

LEWIS B. KELLUM

#### SELECTED BIBLIOGRAPHY

CASE, ERMINE C. "A Census of the Determinable Genera of the Stegocephalia." *Trans. Amer. Phil. Soc.*, N.S., 35 (1946), Pt. 4: 325-420.

———. "An Endocranial Cast of a Phytosaur

from the Upper Triassic Beds of Western Texas." *Journ. Comp. Neurol.*, 45 (1928), No. 1: 161-68.

———. *Contrib. Mus. Paleontol. Univ. Mich.*,

- Vol. II, Nos. 4, 6, 11, 12; Vol. III, Nos. 1, 5, 8, 9, 11; Vol. IV, Nos. 1, 2, 3, 6, 7, 8, 9, 13, 14; Vol. V, No. 6; Vol. VI, Nos. 1, 10; Vol. IX, No. 5 (1925-51).
- . *Occ. Papers Mus. Zool. Univ. Mich.*, Nos. 12, 62, 82, 101 (1915-21).
- . *Papers Mich. Acad. Sci.*, Vol. 4: 419-24; Vol. 20: 449-54 (1924-35).
- . "Something about the Paleontological Collections in the University." *Mich. Alum.*, 27 (1921), No. 5: 292-300.
- . "The Bloomfield Hills Mastodon." *Bull. Cranbrook Inst. Sci.*, No. 4 (1935).
- . "Valuable Specimens Recently Added to the Paleontological Collections of the University." *Mich. Alum.*, 21 (1915), No. 5: 248-50.
- CLARK, JOHN M. *James Hall of Albany, Geologist and Paleontologist 1811-1898*. Albany, 1921.
- EHLERS, GEORGE M., and WILLIAM E. HUMPHREY. "Revision of E. A. Strong's Species from the Mississippian Point Au Gres Limestone of Grand Rapids, Michigan." *Contrib. Mus. Paleontol. Univ. Mich.*, 6 (1944), No. 6: 113-30.
- In Memoriam Edwin Atson Strong*. Ypsilanti: Published by the Faculty of the Michigan State Normal College, 1920.
- Proceedings of the Board of Regents . . . .*, 1865-1940.
- University of Michigan Regents' Proceedings . . . .*, 1837-1864. Ed. by Isaac N. Demmon. Ann Arbor: Univ. Mich., 1915.
- UTLEY, HENRY M., and BYRON M. CUTCHEON, Comp. *The Class of Sixty-One, University of Michigan*. Detroit, 1902.
- WINCHELL, ALEXANDER. MS, Acquisition Register. Current numbers 7869-9095.
- . MS, A. Winchell's Collection. Serial numbers 1-4875.
- . MS, Museum of the University of Michigan. Geology. Vol. I. Serial numbers 1-7868.
- . MS, Register of Stella Cabinet Belonging to Alexander Winchell. Vol. II, Feb. 1, 1885. Serial numbers 4876-7006.
- . *Report, Historical and Statistical, on the Collections in Geology, Zoology and Botany in the Museum of the University of Michigan*. Ann Arbor: Univ. Mich., 1864.
- . *Report of Operations in the Museum of the University of Michigan in the Department of Geology, Zoology and Botany, and the Department of Archaeology and Ethnology*. Ann Arbor: Univ. Mich., 1873.

**Reprinted from:** Kellum, Lewis B. 1956. The Museum of Paleontology. In: W. A. Donnelly, W. B. Shaw, and R. W. Gjelsness (eds.), *The University of Michigan: An Encyclopedic Survey, Part VIII, Libraries, etc.*, University of Michigan Press, Ann Arbor, pp. 1487-1502.