UNIVERSITY GIFT: A VAST FOSSIL VERTEBRATE COLLECTION

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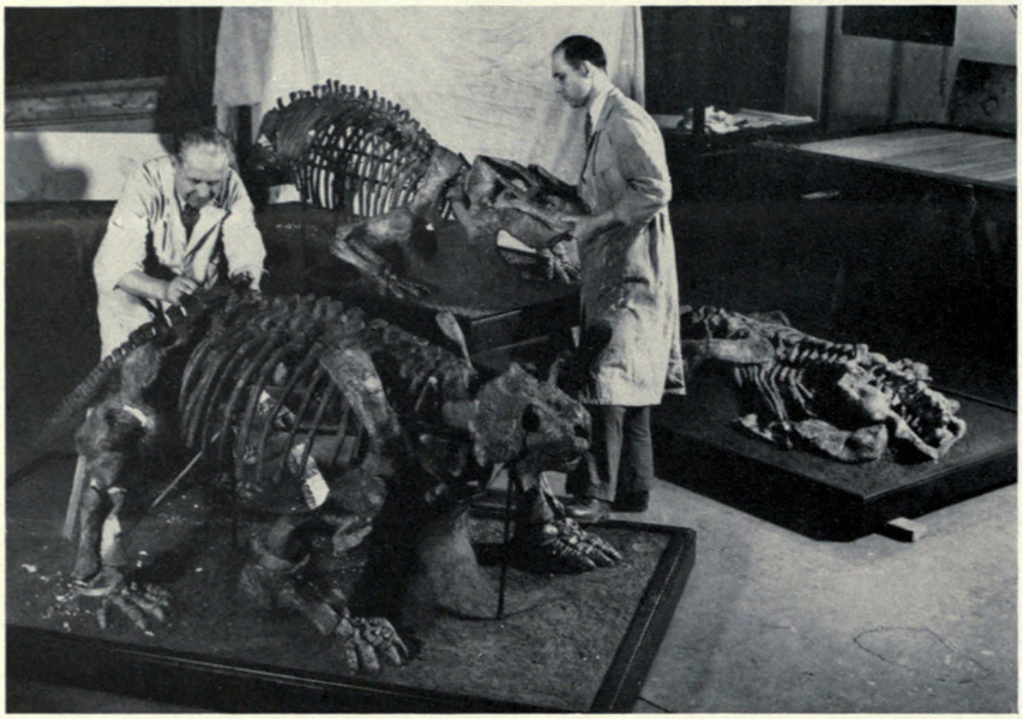
CURATOR OF FOSSIL MAMMALS

More than 300 million years ago, in that period of the earth's history known as the Devonian, some lobe-finned fish came out of the water. The precise manner of their coming is not known. But the event was one of the most momentous that occurred in the long history of life on earth, for it was destined to lead, among other things, to the rise of the dinosaurs and their eventual replacement by the mammals, to the appearance of man and the development of his civilizations, to total wars and the release of atomic energy.

Between the coming forth of the fish and even the first of these later refinements, however, 150 millions of years were to elapse. During this immense stretch of time, the world was to witness the rise and differentiation of the amphibians that were the descendants of the lobe-finned fish and the early radiation of the reptiles that were, in their turn, the descendants and later on the supplanters of the amphibians.

To many students of the subject, this is the most fascinating period of vertebrate evolution. Heretofore, because of lack of specimens, the Museum has not been able to present it satisfactorily to the public. This deficiency has now been overcome, thanks to one of the most munificent gifts in the history of the institution. Since the 1890s, the University of Chicago has been pursuing an active program of collecting, research, and exhibition in vertebrate paleontology, largely concentrating its efforts on the faunas of Permian and Triassic age. These two periods, marking, respectively, the close of the Paleozoic era and the opening of the Mesozoic, saw the final flowering of the amphibians and much of the rise of the reptiles. The collection, one of the finest of its kind in existence, that has resulted from this work has been presented by the University to the Museum. Merely to enumerate and comment briefly on all of the groups represented would require an article several times the length of this one. Space permits mention here of only a few, leaving more detailed discussions for the future.



LARGE SPECIMENS PRESENT MOVING-DAY DIFFICULTIES

Minor injuries to ancient skeletons suffered during transportation of the fossils from the University of Chicago to the Museum are repaired by Preparator Stanley J. Kuczek (left) and Chief Preparator Orville L. Gilpin. The specimen in the background is a dicynodont; the other two are pareiasaurs.

MODERN RELATIVES OVERSHADOWED

The amphibians of today—the well-known frogs, toads, and salamanders and the unfamiliar caecilians—convey almost no idea of the group in its heyday. From the later Devonian until well into the Pennsylvanian period, they were the dominant, indeed for most of that time the only, land vertebrates, and they were still abundant during the early Permian. A great number of diverse forms arose, the largest of which attained the size of crocodiles. The most important and best-known group had solidly roofed skulls and teeth with peculiar labyrinthine infoldings of the enamel, both characters inherited from the ancestral fishes. The large and ungainly *Eryops*, the smaller but even more clumsy-looking *Cacops*, and *Trematops* are early Permian types represented in the collection by mounted skeletons.

The present-day frogs and toads are now believed to be modified, in many ways degenerate, descendants of this labyrinthine-toothed division. A member of another group of amphibians is the extraordinary *Diplocaulus*, an aquatic form with greatly reduced limbs and a skull that could almost be described as boomerang-shaped. Although they pioneered in the invasion of the land, the amphibians never completely conquered it. Professor Alfred S. Romer has aptly remarked that in the water they are born; to the water they must periodically return. They never succeeded, as a whole, in evolving an egg that could be laid on land, left to develop there, and from which there would hatch a small but fully formed replica of the adult. In a restricted sense, however, they did accomplish this feat, for the labyrinthine-toothed amphibians gave rise to the reptiles that took this last, decisive step to true land life.

The division between reptile and amphibian, so sharp today, was by no means clear-cut in the late Paleozoic. It is a matter of discussion whether a certain group, typified by an animal called *Seymouria*, should be referred to the one class or the other, and quite possible that the more or less arbitrary dividing line between the two may have been crossed more than once. Be this as it may, reptilian diversity was rapidly attained, and by Permian time a great variety of forms was in existence.

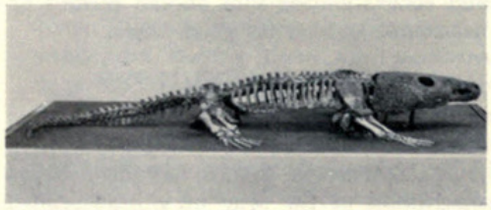
Included in the collection are skeletons of the primitive *Labidosaurus*, of the little *Captorhinus* (a suite of whose remains from a fissure filling are almost perfectly preserved), of the lumbering pareiasaur *Bradysaurus*, and of various pelycosaurs. These last are of extreme interest, not only because they were on the line that was to lead to the mammals but also because of the extraordinary structure attained by two of the latest representatives of the order. *Dimetrodon* and *Edaphosaurus*, the forms in question, were characterized by immensely long dorsal spines on the trunk vertebrae that were joined together in life by skin. What function, if any, was served by these "sails" is wholly conjectural. In the edaphosaurs and their relatives of the *Casea* group, furthermore, we have the first truly herbivorous land vertebrates.

FIRST TAPPING OF PLANT FOOD

Among the other early reptiles and the amphibians, the larger ate the smaller, the smaller the smallest, and the smallest in turn subsisted on insects and other invertebrates. Here was the first direct tapping by the backboned animals of the food supply afforded by the plant world, a resource that was to be used extensively by the later reptiles and even more so by

the mammals. The early Permian material in the collection comes mainly from Texas. The later Permian and early Triassic faunas are represented by specimens from the Karroo, that classic collecting ground in South Africa. Among them is a good series of the therapsid reptiles that were the descendants of the pelycosaurs and the ancestors of the mammals.

Although the groups mentioned constitute the most famous part of the University



TREMATOPS SKELETON

An early Permian labyrinthine-toothed amphibian that attained a length of about 30 inches.

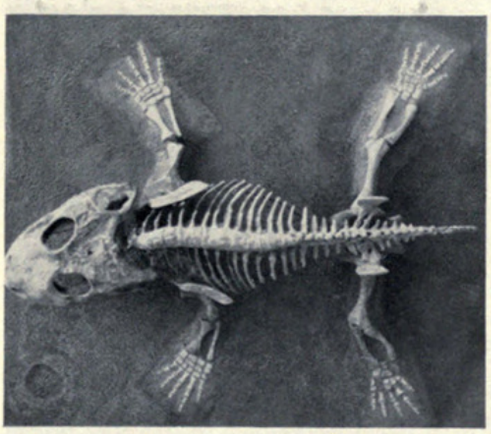
collection, they are by no means all there is of it. A considerable amount of fossil fish material, including a notable series of American Paleozoic remains brought together by the late Mr. William F. E. Gurley, will aid materially in filling a long-felt gap in the Museum's collection. The fossil mammals, mostly from the White River Oligocene of the Great Plains, supplement rather than complement those already in the Museum, but they are nevertheless a most welcome addition. Almost as if eventual union had been foreseen, the Museum and the University concentrated their field work in deposits of different ages, the University working chiefly in the late Paleozoic and early Mesozoic, the Museum in the late Mesozoic and the Cenozoic. Fusion has thus gone far toward filling the gaps in each.

The University collection began in a modest way with the collecting activities of the late Professor Georg Baur, who, as a young man, had come to this country from Munich to work with Professor O. C. Marsh of Yale, one of the founding fathers of American vertebrate paleontology. Baur was succeeded by the late Professor Samuel Wendell Williston, who had also served a term as assistant to Marsh. It was under Williston that the bulk of the Texas Permian material was acquired.

The tradition of Permian work was continued by Professor Romer, now of Harvard, and is being maintained by his successor, Dr. Everett C. Olson, the present incumbent of the chair and also Research Associate at the Museum. The late Mr. Paul C. Miller, formerly Curator of the University collection and one of the great collectors that America has produced, was associated with all but Baur. He personally collected and prepared most of the specimens and assembled every mounted skeleton. In a very real sense the collection is his monument.

BASIS OF MUCH RESEARCH

Material in the collection has been studied by these men, by their students, and by



SKELETON OF CACOPS

A large-headed amphibian, about 18 inches long, from the early Permian of Texas. The bony armor along the back presumably served for defense against larger predaceous forms.

other investigators and much has, in consequence, been published upon it. Because of this, the number of specimens that have been figured and described in the literature as well as of those that have served as the bases for descriptions of new species and higher taxonomic categories is large. It is upon this considerable volume of published work that the wide reputation of the collection largely rests. It may be said with considerable assurance that no discussion of the evolution of the early land vertebrates has appeared that has not been influenced either directly or indirectly by the knowledge gained from the specimens in it.

The gift of the collection does not mark the termination of the University's interest in vertebrate paleontology. It is, rather, a major step in a continuing integration of effort of the two institutions in this field. Both the University and the Museum are and will continue to be interested in furthering research and in collecting the specimens on which such work is based. The housing and care of the material falls, as is proper, to the lot of the Museum. In disseminating the knowledge gained, the two institutions address themselves in the main to different audiences in different ways—the University to its students by direct instruction and the Museum to the general public through the medium of exhibits. Both groups will benefit from the concentration of specimens.

Advanced classes in vertebrate paleontology have for several years been conducted in the Museum building. The advantage of the new arrangement to the students is obvious; no amount of listening to lectures or looking at published figures can supply the experience that is to be gained from first-hand examination of material. The Museum visitor can now see more of the grand sweep of vertebrate history. Access to the University collection was, to be sure, not denied him before; the specimens had been exhibited on the campus for many years, but, although they were known to specialists the world over, it is probable that hardly one Chicagoan in a thousand was aware of their existence.

Incorporation of material from the University collection into the Museum's exhibition series will of necessity take some time to accomplish. Pending the revision that this will entail, a number of skeletons of early amphibians and reptiles, including nearly all forms mentioned in this article, are being placed on temporary exhibition in Ernest R. Graham Hall (Hall 38).

ARKANSAS ZOOLOGY TRIP

On March 20, Mr. Colin C. Sanborn, Curator of Mammals, left for Arkansas accompanied by Staff Taxidermist Frank C. Wonder and Señor Celestino Kalinowski, a Peruvian student at the Museum. They will be joined later by Mr. Rush Watkins, of Chicago.

This trip will be the "maiden voyage" of the new Chevrolet Carry-all recently purchased by the Museum for zoological field work. Collecting of mammals, reptiles, and plants will be carried on near Marcella in the Arkansan Ozarks. This is the second of a series of field trips to collect and study the mammals of Arkansas.

THIS MONTH'S COVER

"For, lo! the winter is past, the rain is over and gone; the flowers appear on the earth; the time of the singing of birds is come, and the voice of the turtle is heard in our land." (THE SONG OF SOLOMON ii, 11, 12)

Our cover picture shows part of a habitat group—Illinois Woodland, Chicago Area, in Spring—in Martin A. and Carrie Ryerson Hall (Plant Life, Hall 29).

Trees shown in the exhibit include sugar maple, American elm, linden, white oak, witch hazel, black cherry, and pale dogwood. Among the flowers seen are white and pink trilliums, dogtooth violets, Virginia bluebells, wild ginger, columbines, Jack-in-the-pulpits, Solomon's seals, and blue, yellow, and spurred violets.

The group was prepared in the Department of Botany's plant reproduction laboratories under the supervision of Curator of Exhibits Emil Sella. The background is by Staff Artist Arthur G. Rueckert.