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LECTURES
[*Illustrated*]
TERNOONS AT 2:15
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G. Richards, paleontologist
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FOR AN END
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—ANDREW CARNEGIE

LIFE RESTORATION OF THE STEGOSAURUS BY A. AVINOFF

THE ROOFED LIZARD

A Robust Giant of the Past That Roamed the West in the Mesozoic Era

THE colossal figures of prehistoric animals on exhibit at the St. Louis World's Fair in 1904 and again at the World's Fair in Chicago in 1933 and 1934 were a source of curiosity, wonder, and awe to the Lilliputian man of the twentieth century. An entire world, which up to this new era had been common knowledge only to paleontologists and other students of the life that inhabited the earth during the vast periods of time before man's existence, was telescoped into general public interest by an actual sight of these creatures—if not in the flesh, at any rate ingeniously and felicitously simulated. In this way modern advertising serves to stimulate a popular interest in scientific knowledge. For, with the innate curiosity that is so inseparably a part of man's nature, inquisitive observers who heretofore had rarely given the subject a passing thought, sought museums and libraries to see and read about the authentic sources from which the animated models were created.

On that day in 1898 when Andrew Carnegie expressed his wish to the late W. J. Holland that a representative collection of the extinct animals of the past should be assembled in the Carnegie Museum, a new stimulus was lent to the study of prehistoric vertebrates. Other museums had previously made marked progress in investigating and exhuming various specimens, but it remained for Mr. Carnegie's vision to impart that crystallizing impetus that was to have repercussions throughout the scientific world.

The following year, when the field

studies were rewarded by the discovery of the first complete skeleton of a Diplodocus in block clay in Wyoming, Dr. Holland named this type specimen Diplodocus carnegiei in honor of the patron and from it replicas now in museums all over the world were later made.

The dinosaurs used in the Chicago World's Fair exhibit represent only a few—six in all—of the more familiar ones that lived during prehistoric ages. Of the several thousand distinct species of these scaly or armored air-breathing reptiles already discovered, some walked on all four legs and others upright on their hind legs. The Apatosaurus—deceitful lizard—was one of the best known of the four-legged group. It stands beside the Diplodocus in the Hall of Paleontology in the Carnegie Museum and was made the topic of a narrative by Charles W. Gilmore, Curator of Vertebrate Paleontology at the United States National Museum, in the June, 1936, CARNEGIE MAGAZINE.

Presenting probably as weird an appearance as any of the dinosaurs, and causing as much public comment both in St. Louis and Chicago, was the Stegosaurus pictured in Dr. Avinoff's imaginative drawing based on scientific research that accompanies this article. Inquiring visitors who wish to investigate it in more detail will find its initial parts, which precede the installation of the whole, on display in the same gallery as the Diplodocus. This queer reptile flourished perhaps more than one hundred million years before a model of its grotesque body became one of the sights of a modern fair ground.

The stages of evolution attained by fossil animals determine the age of the rocks in which they are found. To make reckoning easier, the geologic time has been divided into five major parts, called eras. These eras in turn are broken up into periods. Thus the era in which the reptiles flourished was called the Mesozoic era. The term Mesozoic is derived from the Greek words "middle of life" to indicate its position as the era intervening between the Paleozoic, ancient-life-era, and the Cenozoic, recent-life-era. The periods into which the Mesozoic fell are: first, the Triassic, referring to the tripartite or triple division of the rocks of that period in Germany; second, the Jurassic, taken from the Jura Mountains between France and Switzerland, in which the strata are excellently displayed; and third, the Cretaceous, so called from the chalk deposits pertaining to the formation in Western Europe. The relationship of these eras and periods to each other is particularly well illustrated in the chart that appeared in the CARNEGIE MAGAZINE for March, 1938.

The Mesozoic era has often been called the Age of Reptiles, and rightly so, because there were very few birds in this ancient world and no mammals except very small ones not unlike our opossum. It may well be called, also, the Age of Dinosaurs because it was during this period, lasting more than an eon of geological time, that the dinosaurs tramped the earth. Nearly world-wide in distribution, their remains are especially numerous and well preserved in some of the states in our own Far West. During their evolution this group of vertebrates developed rapidly into a number of such highly specialized types that it excites the imagination to realize that they form one related group of animals. Great awkward beasts eighty feet in length—the largest land animals that ever lived—belong to the same group as little creatures no larger than a rabbit. Somewhere between these two extremes fall the Stegosauria or armored dinosaurs, all of which were quadrupedal, and all characterized by a peculiar dermal armor that sets them apart from the others.

If one could imagine a dragon in reality, the form of the Stegosaurus might well serve as a perfect example. The roofed lizard—for that is what his name means—was an awkward angular brute, not large compared with the

EXCAVATING IN THE DINOSAUR QUARRY

Apatosaurus but with proportions just as exaggerated. Its small head, short front legs, and short tail pulled it down at both ends, causing the irregular armament of broad, upstanding, dermal plates rising massively along its spine and terminating in four spikes near the end of its tail to arch disproportionately in the center. This armament, properly terrifying to modern eyes, was the Stegosaurus' only means of self-preservation and defense in a world of creatures often three times its size. The tail, armed with its bristling spines more than two feet long, must have served as a fairly effective clublike weapon that discouraged the attacks of its enemies.

Each age with its attendant struggle for existence has left man and his vertebrate friends and enemies a shade more intelligent. In Mesozoic times, when the Stegosaurus roamed the swampy courses of Jurassic rivers in Colorado, Utah, and Wyoming, strength and tenacity alone enabled it to survive. Despite its bulk—the Stegosaurus was twenty-five feet long and must have had at least the robust weight of the largest of living elephants—its skull shows a brain space no larger than that of a kitten three weeks old! Perhaps that is why the Dinosauria, including the bizarre and fantastic animal whose name shows that he belongs to this group—dinosaur, terrible lizard; Stegosaurus, roofed lizard—reached an evolutionary cul-de-sac and were removed by Nature from an ever changing world.

During the years since Mr. Carnegie initiated the Carnegie Museum collection, its Department of Vertebrate Paleontology has furthered popular and scientific knowledge of a whole host of prehistoric vertebrates both by original research in the laboratories in Pittsburgh and by the investigation of fossil quarries in the West.

Research in the dinosaur quarry, a point about five thousand feet above sea level in the eastern extension of the Uinta Mountain range, has been particularly profitable, yielding remarkable specimens—whole skeletons of animals, rather than the fragments hitherto uncovered—of the life of the Age of Reptiles. It is in this colorful region of northeastern Utah that the most recent, and probably the greatest, consequence of Mr. Carnegie's interest may soon be produced, that is, a carven cliff-picture of dinosaur bones, dating primarily from Jurassic times, that will be a resurrection of a whole mass of saurian fossils when it is completed.

In 1909 Earl Douglass, pioneer pale-

ontologist at the Carnegie Museum, discovered this deposit—the richest ever found—and took from it Apatosaurus, the gigantic sauropod mentioned above, which is seventy-five feet long. This skeleton was almost complete—caught in death, it had preserved exceedingly well—and in excavating it, other specimens in just as perfect a state were uncovered. During the next thirteen years over three hundred skeletons and parts of skeletons comprising three hundred and fifty tons, or about seven hundred thousand pounds, were removed, often containing some great and unexpected discovery of totally new genera. In fact, seven entirely new species were found, and are the basis of the unequalled collection of fossil dinosaurs at the Carnegie Institute today.

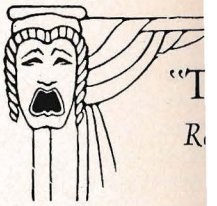
In 1915 President Wilson, at the request of Dr. Holland, then Director of the Carnegie Museum, set aside an area of eighty acres embracing the quarry, named it the Dinosaur National Monument, and placed it under the National Park Service. This action made paleontological exploration easier, and the Carnegie Institute carried on its extensive active work in the quarry until 1923. At that time the deposits had barely been touched, even though so many fine skeletons and fragments had been withdrawn. It is thought that the deposit had been, eons ago, a stream bed and the dinosaurs are buried in this stratum. When the mountains were heaved up, the channels of the stream were turned up, also, so that there are probably countless other specimens yet to be recovered.

With this idea in mind the American Museum of Natural History in New York, the State of Utah, and the Park Service have banded together to work out a project whereby these many dinosaurs still imbedded may be displayed in their own strata for further public education and enlightenment. One of the smaller areas in the National Park Service, this ground when it has been prepared for public use will contain by far the most remarkable exhibition of skeletal remains in the world. A prehistoric mural in a position that everyone can see is to be chiselled out of the rocky cliff, and dinosaurs' skeletons, just as Nature left them, are to be carved out of the rock of ages in high relief, in order to reconstruct the life of that vanished age. The deposit is to be exposed by removing the superimposed rock, and it will show skeletons of the largest of the sauropods mingled with the skeletons of powerful but smaller flesh-eating dinosaurs, the heavily armored forms like the Stegosaurus, and the smaller birdlike reptiles. The stratum has not been disturbed other than being thrust up at a steep angle of sixty-five degrees during some stage in the earth's evolution, and the unusual accumulation and quality of the specimens indicates that the display will be unequalled.

CARNEGIE DAY

The twenty-sixth annual observance of Carnegie Day in celebration of the birthday of the founder, Andrew Carnegie, was held in Carnegie Music Hall Tuesday morning, November 22. Professor John Erskine, noted author and lecturer who is conducting the music-appreciation course mentioned in the October Carnegie Magazine, spoke on the subject "Adventure."

President Doherty awarded scholarship cups to Tau Delta Phi fraternity, Gamma Gamma Gamma sorority, Henderson Hall, men's dormitory, and Whitfield Hall, women's dormitory. The three honorary organizations having the highest scholastic averages were permitted to make their annual call to membership. Phi Kappa Phi, national scholastic honorary, called thirty-eight members of the senior class and ten faculty members. Tau Beta Pi, national honorary in engineering, called ten seniors and three juniors. The third honorary to make a call was Sigma Alpha Iota, national honorary in music, which pledged twelve women students.



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