

## FOSSILS ARE HIS BUSINESS

Clark and his assistant Arnold Lewis spent three months' field work in the Basin of northeastern Utah and will dig in the Eocene strata.

It becomes colder the party will move to northern Utah to hunt fossil reptiles in the Eocene period, which is almost entirely new in the paleontological collection of the Carnegie Museum. Later they will dig in the Mojave Desert of California, for fossil camels.

There was evidently one family of great flying clan of hawks and who forsook the air and took to the ground again. Gradually they lost the power of flight. At the time our bird lived, it was one. Apparently some birds, people, do not appreciate a thing when they have it.

That day, one other family of vulture clan has also returned to the ground. The secretary-birds of Africa are also hawks, but they hunt down snakes and other game rather than by flying in their food. Like our vulture, they have powerful heads, long legs, and wings. Thus two families of birds that ordinarily flies magnificently abandoned the clan custom and returned to their ancestral dwelling place on land.



CARNEGIE MUSEUM

THE ANCIENT VULTURE

THE word "fossil," in case you hadn't realized it, literally means anything that is dug up, for the word comes from the Latin verb *fodere*, meaning "to dig up." However, paleontologists arbitrarily apply the word to plants and animals that date back 25,000 years to the end of the Ice Age, before modern climate set in bringing with it modern flora and fauna.

A fossil may be entirely the original bone of the creature or it may be a completely different material, substituted through the years, or, again, it may be any degree of substitution between.

The minerals carried by water as it seeped through the ground around the buried creature determined the composition of the replacing material—it may be lime, silica, copper, manganese dioxide, iron hydroxide. The smaller bones of a fossil are likely to be extremely fragile; the large ones may be very heavy. Some fossils are radioactive—not dangerously so, but sufficient to photograph themselves, given long enough time.

Fossils are Serafino Agostini's daily business. He came to Carnegie Museum thirty-three years ago to work on the giant *Diplodocus carnegiei*, the first of the Museum's collection of dinosaurs. He is here pictured with a tiny fossil deer that he completed a year or so ago, one of his special pets.

Quizzed about his favorite displays, he replies forthrightly: "Why, I'm

proud of the whole Hall." However, the little deer, technically known as *Hypertragulus*, one of the most delicate skeletons ever to be mounted in the

round anywhere in the world, he is very fond of, as well as a group of three small camels, *Stenomylus*, also of very fragile framework. The Carnegie Hall of Mammals is probably the highest quality paleontological exhibit in the world, for less than one bone in ten on display is of plaster. Only complete skeletons are on exhibit. The Hall of Fossil Mammals, which, with the Hall of Fossil Reptiles,

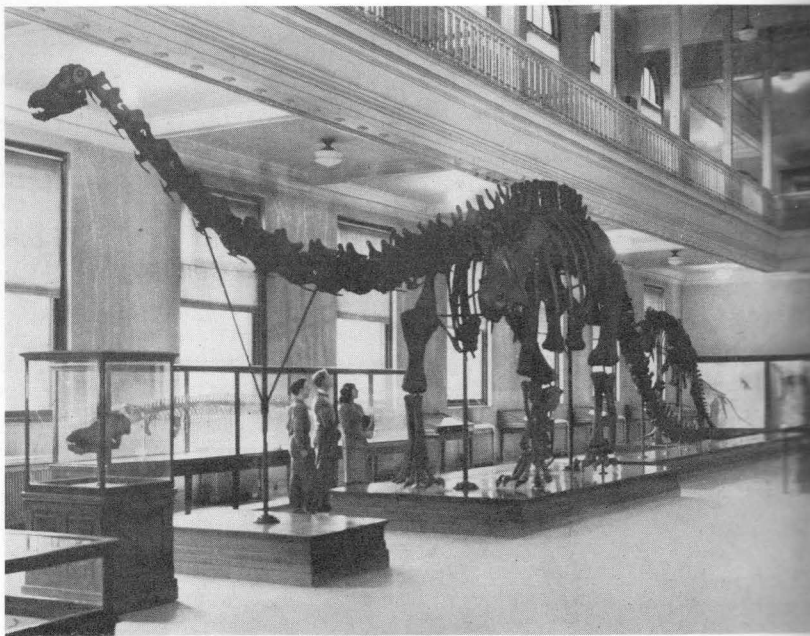


MR. AGOSTINI AT WORK

comprises the Museum's collection of fossil vertebrates, exhibits nearly forty mounted skeletons, of which all but three are Mr. Agostini's work.

Fossils arrive at the Museum embedded in blocks of stone which have been cut and carefully packed by members of the staff working in the field. The bones must be carefully chipped from the stone, cleaned, strengthened, and mounted according to a scientific diagram. For his work Mr. Agostini uses dental tools and leather-worker's tools. Sometimes he designs his own implements, and for this the laboratory in the basement of the Museum, informally termed "the bone room," is equipped with a gas forge and anvil.

Andrew Carnegie was enthusiastically interested in the newly discovered dinosaurs in 1903 and had sponsored the expedition which unearthed the giant



THE GIANT DIPLODOCUS CARNEGIEI, SEVENTY-EIGHT FEET LONG, HAS FASCINATED VISITORS AT CARNEGIE MUSEUM FOR MORE THAN FORTY YEARS.

*Diplodocus carnegiei* in Wyoming. As a gesture of international good will he wanted to ship overseas to several foreign countries plaster duplicates of this huge dinosaur, the like of which had never been seen by scientists abroad. Making of the duplicates was an unusual task and a complicated one—but fortunately Mr. Agostini was found and he was willing to try. At the time he had been working for eight years with a Pittsburgh manufacturer of church statuary. He had come to this country from Italy as a youth of fifteen.

To produce the plaster dinosaurs, a cast had to be made of each bone. The entire bone could not be copied at one time but, protected by a thin coating of wax, must be marked off by wax ridges into small sections, sometimes as many as twenty to one bone. Then plaster was poured on. Assembled in the shape of the whole bone, this shell was filled with glue, which hardened. After the sections of plaster were removed, a complete plaster cast of the bone was made around this glue model. The plaster

could not be cast directly on the bone because of its brittleness. Wire and iron reinforcements were then added to the bones. Shipping of the plaster bones for an entire *Diplodocus carnegiei* took thirty-five boxes. Dr. William J. Holland, then director of the Museum, and Arthur Coggeshall, then laboratory head and now director of the Samuel R. Noble Museum of Natural History, traveled to each foreign museum to direct the assemblage of the skeleton. France, Germany, England, Austria, Italy, Russia, Spain, Argentina, and Mexico received a copy.

After the plaster duplicates were made, the original *Diplodocus carnegiei* had to be mounted. Mr. Agostini and the two Coggeshall brothers worked for two years to complete the task. It was one of the first skeletons of a dinosaur or giant reptile, to be put on display.

When the work was finished, Mr. Agostini asked Dr. Holland for a job. "He said, 'All right,'—and so I'm still here," the senior preparator explains with a twinkle in his eye. The depart-



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