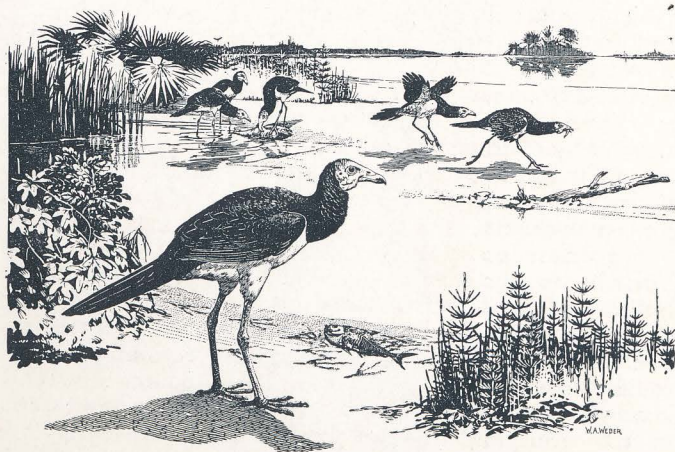


1943, but World War II interrupted progress of our bird at that point. Wetmore's scientific study was published in 1944; only recently Arnold and I, our preparator, mounted the specimen in plaster so that the people of the exhibition hall may see it.

Well, Clark, Agostini, Wetmore, and I—five men co-operating to bring a specimen before the people of the exhibition hall. We have told this story in detail to illustrate how many guesses and how many men must be made before a fossil vertebrate can be mounted in the exhibition hall. And what of the bird himself? Dr. Wetmore found that he represents an extinct family of birds previously unknown. He was a vulture, but a vulture that lived on the ground and was unable to fly! Most of us think of a vulture as a great, black bird soaring in magnificent circles through the ether sky. As one author describes the modern vulture is "the epitome of grace while in the air, and of clumsiness while on the ground."

Even the casual visitor can see that the ancient vulture had a head as large as an eagle's, legs and feet as long as a crow's, and a small body with wings larger than a crow's. The restoration shows him striding about on the shores of the lake of the shales that dot the ancient mining landscape, feeding on fish and other small animals. His short wings would carry him on brief, fluttering excursions into the air, but soaring like a modern vulture was impossible. Wetmore gave the scientific name *Eocathartes aura*, which means "the running vulture."



A RESTORATION OF THE ANCIENT VULTURE

John Clark and his assistant Arnold Lewis left last month for three months' field work in the west. They are joining J. LeRoy Kay in the Uinta Basin of northeastern Utah and will be working in the Eocene strata.

As it becomes colder the party will move to southwestern Utah to hunt fossil reptiles in the Triassic period, which is almost entirely unrepresented in the paleontological collection of Carnegie Museum. Later they will work in the Mojave Desert of California, searching for fossil camels.

Thus, here was evidently one family from the great flying clan of hawks and vultures who forsook the air and took up life on the ground again. Gradually this family lost the power of flight until, by the time our bird lived, it was almost gone. Apparently some birds, like some people, do not appreciate a good thing when they have it.

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

## FOSSILS ARE HIS BUSINESS

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.

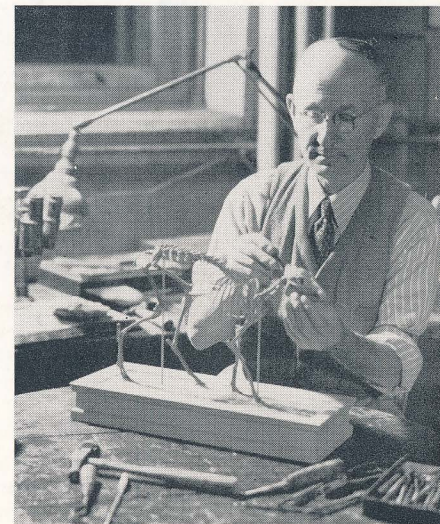
The minerals carried by water as it seeped through the ground around the buried creature determined the composition of the replacing material—it may be lime, silica, copper, manganese dioxide, iron hydroxide. The smaller bones of a fossil are likely to be extremely fragile; the large ones may be very 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 forty-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,



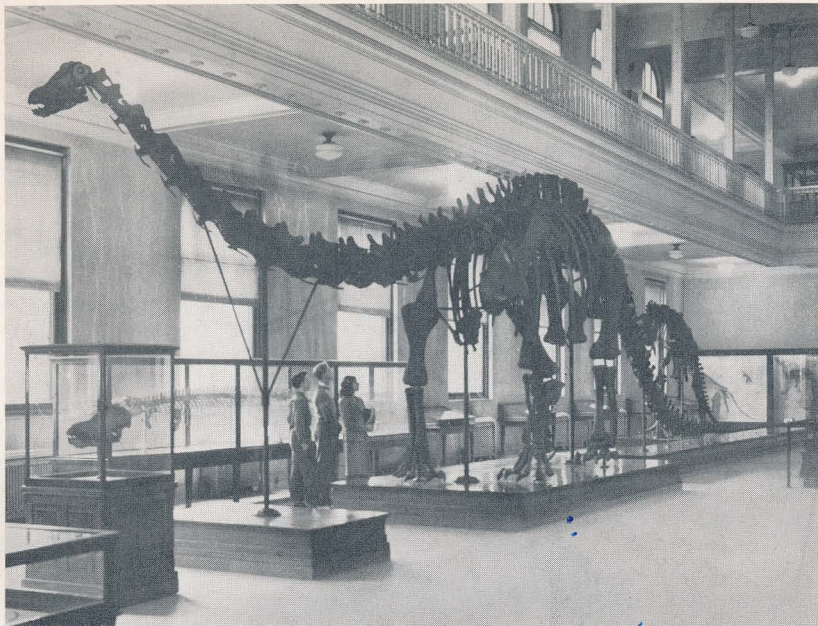
MR. AGOSTINI AT WORK

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 Santa Barbara 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-



## THE GARDEN OF GOLD



GIFTS for the Carnegie Institute this fall have come mainly in the form of membership fees in the newly organized Fine Arts and Museum Society.

Aside from this, we shall continue the list of contributors to the David H. Light Memorial Record Library, as follows: Mr. and Mrs. Samuel Rosenberg, Charles J. Rosenbloom, Dr. and Mrs. Sidney A. Rosenburg, Dr. and Mrs. Frank Rosenthal, Reverend

Carlo Rossini, David Rothman, Dallmeyer Russell, S. & S. Printing Co., Mrs. Jack B. Sack, Victor Saudek, Herbert F. Saylor, Mary B. Scanlon, Emil Schmidt, H. Kloman Schmidt, Harold M. Seder, Joseph A. Shenkan, Mrs. Noah P. Sher, Mrs. Mark Shields, A. E. Shier, Mrs. Leo Shonfield, David Silverblatt, Dr. Alexander Silverman, Charles D. Simon, Mr. and Mrs. Isaac Sissman, and Paul Sladek.

ment of mammals needed a preparator and his skill in delicate work had been demonstrated, so Mr. Agostini entered that department. During the years he has given training in his unique and personally developed methods to men who have gone far in Museum work, among them J. LeRoy Kay and John Clark, present curators at Carnegie Museum. He will retire early this next year and has been urged to rejoin the statuary manufacturer, but hasn't yet made up his mind. He will, at least, continue with his hobby of repairing things for his friends—china, marble, jewelry, "a little bit of everything."

While the work on *Diplodocus carnegiei* was going on, it became evident that the small Museum rooms, which were located in a wing of the present Carnegie Library, would not provide sufficient room for display of the huge skeleton. Thus his interest in dinosaurs was partially responsible for Mr. Carnegie's decision to provide more space for the Museum and Fine Arts Departments, and the enlarged Carnegie Institute was formally opened to the public in April 1907.

In the early days of the century there were about six different paleontological collections in the country—at Yale, at the American Museum, one in Philadelphia, among others. Today work in this field is being done at some forty

different institutions. Its development is moving slowly now, however, because the surface discoveries have mostly been made and because the work is supported largely by endowment. On the other hand, the fossils that are found today are just recently exposed by the elements and consequently are of better quality than many earlier finds.

—J. F. S.

### « TREASURE CHEST »

One treasured reference work in the Technology Department of the Carnegie Library of Pittsburgh is the complete set of specifications and drawings of British patents extending back to 1617. Very few of these sets, issued over a period of more than three centuries, are available in America. Not many libraries have even the current issues, but the Technology Department every year receives some eight thousand patents which must be temporarily filed and later bound.

Many of the early drawings were of large size, up to eight feet or more, and the Library gave careful attention to their preservation by mounting each sheet on muslin. For many years, when drawings were published in uniform size, each volume was bound with a dust flap to protect it.

Because of their industrial importance many of these patents are included in abstracting journals. Thus through a single medium, such as *Chemical Abstracts*, abstracts of patents may be brought to the attention of more than forty thousand readers. Such journals are, of course, available in the Technology Department.

—E. H. McC.