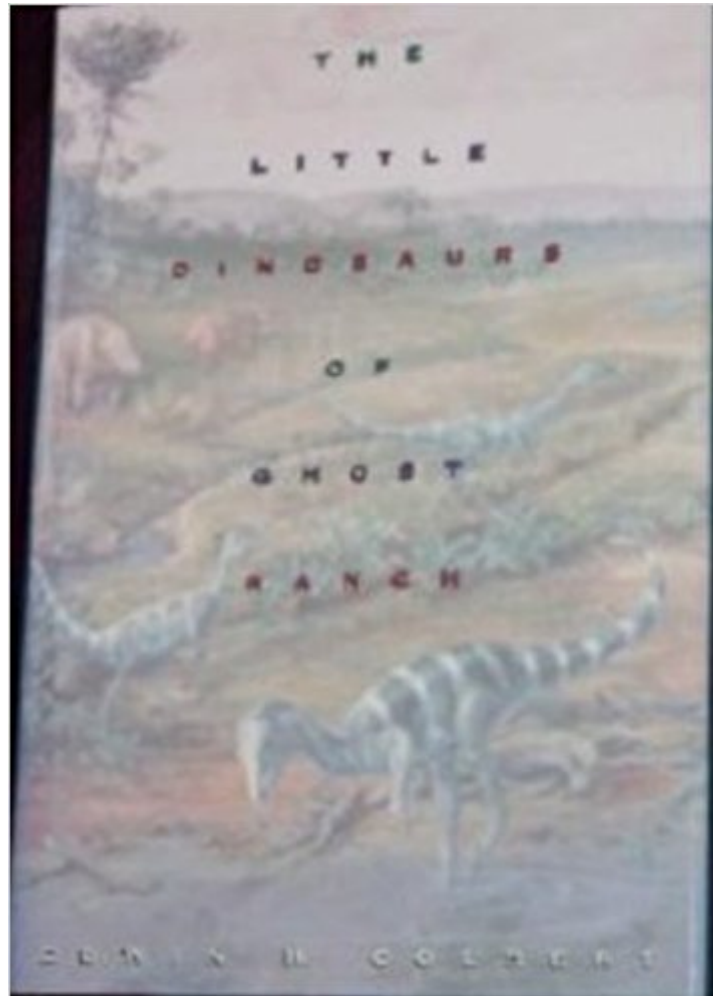




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The Little Dinosaurs Of Ghost Ranch



Synopsis

One of the great mysteries of the ancient past lies within a small quarry in the American southwest, and concerns a carnivorous dinosaur, *coelophysis*, that was no bigger than a large dog. More than a thousand fossilized remains have been found, and evidence suggests that ten times that amount may still be buried. Why are there so many of these little dinosaurs in one small area? The author of this work discusses the 40-year-old history of the excavations at Ghost Ranch, the quarry in Northern Arizona where these remains were discovered, and the million-year-old prehistory of *coelophysis*. A series of photographs and illustrations, accompanied by George Colbert's detailed maps, chronicle the search for the truth about *coelophysis*. A colour insert features the panoramic paintings of Margaret Colbert, giving readers a visual approximation of the prehistoric world.

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Customer Reviews

The Little Dinosaurs of Ghost Ranch by Edwin H. Colbert is a delightful, well-illustrated, and informative book written by the man most responsible for what we know about *Coelophysis bauri*, an important early dinosaur. Writing that one can view this book as a "paleontological case history," Colbert recounted not only the discovery and excavation of the famed mass burial of these little dinosaurs in New Mexico but also what is known of their anatomy, physiology, environment, and what the study of these animals has revealed about dinosaurs in general. Originally on his way to prospect for fossils in Petrified Forest National Park in June of 1947, George Whitaker and the author (both working for the American Museum of Natural History in New York) and Tom Ierardi

decided to investigate a promising fossil deposit on some privately owned land in New Mexico known as Ghost Ranch. The area was known to have produced phytosaur fossils and they only expected to spend a few days there. What instead happened was the beginning of decades of work as Colbert and others over the years came to work on a mass concentration of not "the huge bones of the giant dinosaurs of song and story" but instead the tiny bones of "ancestral dinosaurs." Colbert described in detail the excavation of these 200 million year old fossils in the "colorful rounded badlands" that so entranced famous painter Georgia O'Keeffe (who by the way lived nearby and befriended the scientists). The fossils were "exceedingly fragile," not only because the bones were very small and slender and the leg bones and vertebrae hollow, but because of the nature of their fossilization. They could disintegrate easily into tiny fragments if mishandled. The fossils had to be removed in huge sections instead of relatively thin slabs as the sandstone and siltstone that comprised the Chinle Formation at Ghost Ranch was very friable and liable to collapse. They had to be carefully, painstakingly, and sometimes dangerously removed in huge blocks, coated in thick plaster, burlap bandages, and a supporting framework of wood and then laboriously hauled out of the quarry. Eventually close to thirty blocks were removed from Ghost Ranch. Of course removing the blocks from the quarry was just the start, as years were spent preparing the blocks. Though generally the lab preparation time and labor on a fossil takes more than ten times the work expended in the field, Colbert estimated that it took something "on the order of twenty to one" for Coelophysis. The fossils had to be removed from the rock by hand using jeweler's hammers and small chisels and treated with hardener; even the small, electric vibrating tools, commonly used in paleontology, would quickly reduce the fossils to powder. Very early in the preparation stage the scientists made discoveries. Some fossils preserved the stomach contents of some of the dinosaurs, only the second time this was known from a carnivorous dinosaur and fascinatingly it revealed that Coelophysis was a cannibal! Other interesting tidbits include the discovery of a "giant" Coelophysis eleven feet long (most were usually six to eight feet; what was the ultimate size limit for this species?) and the fact that in almost all the specimens the lower jaw was tightly locked in place against the skull (evidence that the animals were buried so soon after death that muscles still held the lower jaws tightly in place rather than the skull and jaws becoming separated as is common with dinosaurs). Colbert provided information about the history of the study of this dinosaur before the Ghost Ranch excavations, centering on David Baldwin of Abiquiu, New Mexico, who found the original Coelophysis fragments in 1881 and Edward Drinker Cope of Philadelphia who first described them in 1887 (first it was placed in genus Coelurus and later in genus Tanystrophaeus before Cope named it Coelophysis from Greek koilos meaning "hollow" and

physis meaning "form, nature"). A chapter is spent on a quarry survey, describing the nature of the deposit, the climate at the time, and how the animals might have died and then been quickly buried. Though they apparently died in such numbers due to some catastrophe, there is much disagreement on its nature. Colbert discussed theories relating to volcanic activity (there are no volcanic sediments anywhere near the fossil deposit), poisoning perhaps from drinking water from a highly alkaline pond (unlikely as their bones indicated being deposited and buried by stream currents, not in the still waters of a lake), predator trap (unlikely also, as few individuals are maimed and there is very little disarticulation), and asteroid impact (Ghost Ranch "hardly qualifies for a "Wagnerian twilight"" as it was a local event). Most likely it was due to hunger or thirst from a drought or from drowning while crossing a flooding river. Another chapter is spent on the anatomy of Coelophysis, notably on the key features of its skull and jaws, its vertebra, its tail and the role it played in balance and movement, and its bird-like feet with five toes, only three of which were functional. A chapter on its lifestyle showed us what tracks attributed to the animal revealed about its physiology and speed (it seems to have been able to reach maximum speeds of fifteen to twenty miles an hour), what analysis of Haversian canals in the bones revealed about its growth rate and physiology, the complicated issue of just what it means to be "warm-blooded," and discussed issues relating to diet, cannibalism, possible congregation in age groups, the size and shape of their eggs, and what their senses might have been like. Colbert also discussed the ancestors and descendents of Coelophysis, how it was one of a very few late Triassic dinosaurs, residents of a largely non-dinosaurian world, and how it established the pattern followed by later small coelurosaurs, ostrich-like struthiomimosaurs, dromaeosaurs, and the tyrannosaurs. Colbert does not neglect the animals that shared the world with Coelophysis and discussed contemporary amphibians, reptiles, other dinosaurs, pterosaurs, and early mammals.

This is a well-written book that covers the discovery, excavation, and reconstruction of a dinosaur (coelophysis). Discussion centered on this small theropod incorporates broader material, so that the reader gets an understanding of the life and times of other prehistoric creatures in addition to a detailed account of coelophysis

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