

animals such as early mammals and small reptiles. *Coelophysis* also was a cannibal as demonstrated by an adult skeleton from Ghost Ranch that contains the skeleton of a *Coelophysis* baby in its abdomen.

Hundreds (perhaps thousands) of *Coelophysis* skeletons are preserved in the bonebed at Ghost Ranch. However, what killed and buried these dinosaurs is difficult to determine with certainty. The most defensible idea is that the bonebed formed in what was a pond on the vast Late Triassic river floodplain. A flood washed the bodies of the dinosaurs into the depression in which the pond had formed. But, whether the flood or something

else actually killed the dinosaurs is uncertain.

The dinosaur bonebed at Ghost Ranch also includes other kinds of fossils. These include ostracods, conchostracans, scales and bones of bony fishes, skulls of phytosaurs (crocodile-like archosaurs), a skeleton of a rauisuchian (predatory terrestrial archosaur), a sphensuchian skeleton (early crocodile) and jaw fragments of a sphenodont (small, lizard-like reptile).

END OF DAY ONE ROAD LOG

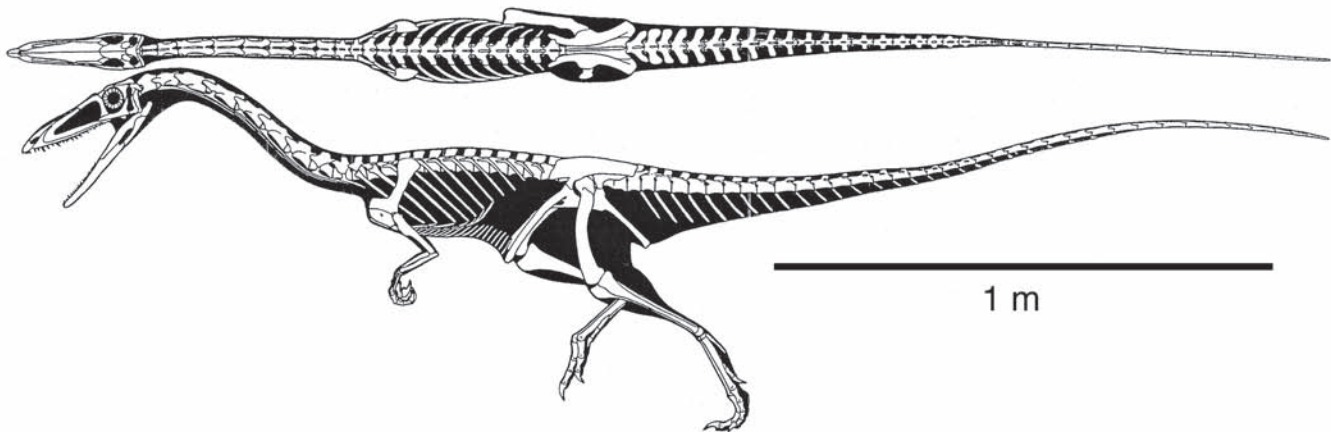


FIGURE 1.29. Skeleton of New Mexico's official state fossil, *Coelophysis bauri* (after Paul, 1993).

THE SAGA OF COELOPHYSIS

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Coelophysis is a Late Triassic theropod dinosaur that is now the Official State Fossil of New Mexico by a 1981 act of the New Mexico State Legislature. The history of the name *Coelophysis*, and the fossils attributed to it, however, is far from straightforward.

In 1881, David Baldwin, a hired fossil collector working for E. D. Cope, discovered various dinosaur bones in Upper Triassic strata at two localities: (1) "Gallina Canyon," according to Baldwin, "400 feet below gypsum horizon, 180 feet above grey sandstone;" and (2) "Arroyo Seco," in a layer "about four hundred feet below gypsum stratum" (Colbert, 1989, p. 5). The gypsum stratum Baldwin referred to is obviously the gypsum of the Middle Jurassic Todilto Formation. Sullivan et al. (1996) further explained the geographic locations (as best as can be determined) of Baldwin's sites, and their stratigraphic level, which appears to have been in the Painted Desert Member of the Petrified Forest Formation of the Chinle Group (Lucas et al., 2003). The problem is that the exact location of the dinosaur bones Baldwin collected

(whether they were from "Mesa Gallina" or "Arroyo Seco") was lost long ago (e.g., Von Huene, 1915).

In 1887, Cope described the dinosaur fossils Baldwin had collected in 1881. He assigned them to two new species of the previously described genus *Coelurus*: *C. longicollis* and *C. bauri* (Cope, 1887a). In an article published later that year, Cope (1887b) then assigned the species to *Tanytropheus* and named a third species, *T. willistoni*. However, Cope (1889) changed his mind again, coining the name *Coelophysis* ("hollow form," in reference to the hollow bones of the fossils Baldwin had collected) for the three species. Hay (1930) designated *Coelophysis bauri* the type species of the genus (Cope had failed to do this), and Von Huene (1911, 1915) first illustrated the fossils of *Coelophysis* Baldwin had collected.

In 1947, an American Museum of Natural History field party, led by Edwin H. Colbert, discovered the dinosaur bonebed at Ghost Ranch, New Mexico. This fossil locality, variously known as the Ghost Ranch, *Coelophysis* or Whitaker quarry (we prefer

the latter, named for George Whitaker, who actually discovered the site) yielded thousands of skeletons of a small theropod dinosaur that Colbert (1947) immediately assigned to *Coelophysis* and later (Colbert, 1964) to *C. bauri* (also see Colbert, 1989). Eventually, Colbert (1989) would designate a lectotype specimen of *C. bauri* from Cope's original material, something that had not previously been done (Padian, 1986).

Hunt and Lucas (1991), however, argued that the type of Cope's species *Coelophysis bauri*, four sacral vertebrae and a pubic process of the ilium (AMNH 2708: Fig. 1.30), is not diagnostic, so *C. bauri* is a *nomen dubium*. Furthermore, the Whitaker quarry is not one of Baldwin's localities where he collected the type material of *C. bauri*; those localities are much lower stratigraphically (in the Petrified Forest Formation; the Whitaker quarry is in the Rock Point Formation) and kilometers (Arroyo Seco) or tens of kilometers (Mesa Gallina) distant from the Whitaker quarry (Sullivan et al., 1996). Consequently, Colbert was not justified in applying the name *C. bauri* to the theropod dinosaur fossils from the Whitaker quarry.

Therefore, Hunt and Lucas (1991) proposed a valid name for the Whitaker quarry theropod—*Rioarribasaurus colberti*—with the type specimen a skeleton (AMNH 7224) from the quarry. This, however, was not accepted by Colbert, who together with several supporters, petitioned the International Commission on Zoological Nomenclature to transfer the type specimen of *Coelophysis bauri* from its lectotype (AMNH 2708) to the holotype of *Rioarribasaurus colberti* (AMNH 7224). This step would validate *C. bauri*, invalidate *R. colberti*, and thus legislate 50 years of error by Colbert in identifying the Whitaker quarry theropod as *C. bauri*. Furthermore, it violated the principle of priority and was proposed by Colbert et al. (1992) without the necessary revisory work called for by the International Code of Zoological Nomenclature.

Politics won on this issue, though, and the Commission set aside its principles to approve the petition of Colbert et al. (1992). Thus, the Ghost Ranch dinosaur is now "legally" called *Coelo-*

physis bauri. The saga of the name *Coelophysis*—from *Coelurus* to *Tanystropheus* to *Coelophysis* to *Rioarribasaurus* to *Coelophysis* again—is a confusing one!

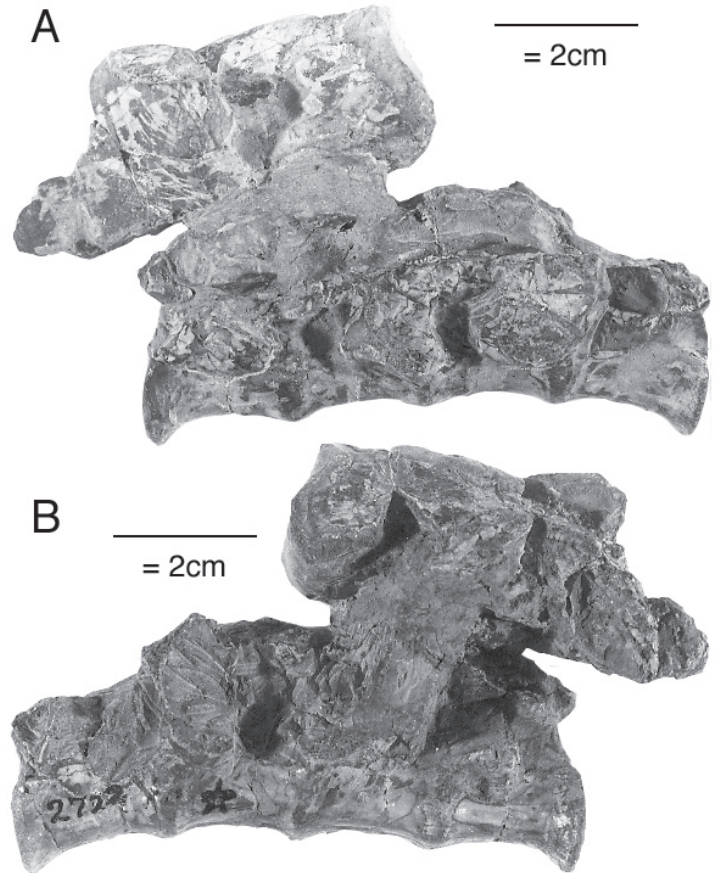


FIGURE 1.30. The lectotype of *Coelophysis bauri*, a sacrum and part of a pelvis.

REFERENCES

- Colbert, E. H., 1947, The little dinosaurs of Ghost Ranch: Natural History, v. 56, p. 392-399, 427-428.
 Colbert, E. H., 1964, The Triassic dinosaur genera *Podokesaurus* and *Coelophysis*: American Museum Novitates, v. 2168, p. 1-12.
 Colbert, E. H., 1989, The Triassic dinosaur *Coelophysis*: Museum of Northern Arizona Bulletin, v. 57, 160 p.
 Colbert, E. H., Charig, A. J., Dodson, P., Gillette, D. D., Ostrom, J. H. and Weishampel, D., 1992, *Coelurus bauri* Cope, 1887 (currently *Coelophysis bauri*; Reptilia, Saurischia): proposed replacement of the lectotype by a neotype: Bulletin of Zoological Nomenclature, v. 49, p. 276-279.
 Cope, E. D., 1887a, The dinosaurian genus *Coelurus*: American Naturalist, v. 21, p. 367-369.
 Cope, E. D., 1887b, A contribution to the history of the Vertebrata of the Trias of North America: Proceedings of the American Philosophical Society, v. 24, p. 221-227.
 Cope, E. D., 1889, On a new genus of Triassic Dinosauria: American Naturalist, v. 23, p. 626.
 Hay, O. P., 1930, Second bibliography and catalogue of the fossil vertebrates of North America, v. II: Carnegie Institution of Washington, Publication 390, v. 2, 1074 p.
 Hunt, A. P. and Lucas, S. G., 1991, *Rioarribasaurus*, a new name for a Late Triassic dinosaur from New Mexico (USA): Paläontologische Zeitschrift, v. 65, p. 191-198.
 Lucas, S. G., Zeigler, K. E., and Heckert, A. B., 2003, Invertebrate paleontology of the Upper Triassic Snyder quarry, Chinle Group, Chama basin, New Mexico: New Mexico Museum of Natural History and Science, Bulletin 24, p. 63-65.
 Padian, K., 1986, On the type material of *Coelophysis* Cope (Saurischia: Theropoda) and a new specimen from the Petrified Forest of Arizona (Late Triassic: Chinle Formation), in Padian, K., ed., The beginning of the age of dinosaurs: Faunal change across the Triassic-Jurassic boundary: Cambridge, Cambridge University Press, p. 45-60.
 Sullivan, R. M., Lucas, S. G., Heckert, A. B. and Hunt, A. P., 1996, The type locality of *Coelophysis*, a Late Triassic dinosaur from north-central New Mexico (U.S.A.): Paläontologische Zeitschrift, v. 70, p. 245-255.
 Von Huene, F., 1911, Kurze Mitteilung über Perm, Trias und Jura in New Mexico: Neues Jahrbuch für Mineralogie Beilage-Band, v. 32, p. 730-739.
 Von Huene, F., 1915, On reptiles of the New Mexican Triassic in the Cope collection: Bulletin of the American Museum of Natural History, v. 34, p. 485-507.