

Amphibia

Metoposaurid amphibians are relatively rare in the Painted Desert Member of the Chama Basin. The few known records—including an isolated centrum from the Snyder quarry and a lower jaw from the Hayden quarry—are much too large to pertain to *Apachesaurus* (ABH pers. obs.). Thus, while not actually diagnostic to the species level, they almost surely pertain to *Buettneria sensu* Hunt (1993), and are among the stratigraphically highest records of the genus.

Reptilia

The strength of the vertebrate fossil record of the Painted Desert Member in the Chama Basin lies in its amniote record, which has grown much more diverse—doubling at the generic level—in the last decade. The record is dominated by archosauromorphs, and is especially rich in phytosaurs and aetosaurs and surprisingly rich in dinosaurs, but depauperate in synapsids and lepidosauromorphs.

Non-archosauromorphs

To date, the only non-archosaurian amniote fossils found in the Painted Desert Member of the Chama Basin are an isolated cynodont humerus and an incomplete lepidosauromorph jaw from the Snyder quarry (Zeigler et al., 2003e; Heckert and Jenkins, 2005). Berman and Reisz (1992) originally described *Dolabrosaurus aquatilis* as a possible lepidosauromorph, but Renesto and Paganoni (1995) considered it a drepanosaurid, so it is covered in the section on archosauromorphs, following Renesto (2000).

Archosauromorpha

From the first fragmentary osteoderms collected by Cope to the enormous excavations at the Canjilon and Snyder quarries, archosauromorphs have always dominated the Chama Basin's Painted Desert Member vertebrate faunas, both in terms of volume and diversity. Like many Chinle sites, especially those of Norian and younger age, phytosaur fossils are the most commonly recovered identifiable vertebrates in the Painted Desert Member of the Chama Basin, but aetosaur and dinosaur fossils are remarkably abundant as well.

It is difficult to overstate the importance of the phytosaur record of the Chama Basin. Cope's initial recognition of phytosaurs ("*Belodon*" *buceros*; Fig. 4) in the 1870s was key to his identification of Triassic strata in the American Southwest. Doubtless the specimens collected from the Canjilon quarry influenced Camp's thinking, even if they made essentially no appearance in his classic monograph (Camp, 1930). Gregory (1962a,b) had the advantage of studying these specimens, and Lawler (1974), Ballew (1986, 1989) and Hunt (1994) also utilized them in their graduate studies. Thus, between these workers and Long and Murry (1995), much of what has been written about pseudopalatine phytosaurs in the American Southwest in the latter part of the 20th century was based, in whole or in part, on the Canjilon quarry sample.

More recently, the Canjilon quarry sample formed the foundation of Zeigler et al.'s (2002c, 2003f) study of sexual dimorphism in phytosaurs (Figs. 6-7), something borne out in their studies of the Snyder quarry sample as well (e.g., Zeigler et al., 2003c) (Fig. 8I-O). These samples were also key to Hurlburt et al.'s (2003) body mass estimations of phytosaurs. With this wealth of study, it is ironic that it was not until 2002 that the taxonomic status of Cope's (Lucas et al., 2002a) and the Canjilon phytosaurs (Zeigler et al., 2002c) was resolved with any certainty.

The aetosaurian record of the Chama Basin is no less important, or ironic. Cope was, by modern standards, a splitter of prodigious proportions, but his recognition of *Typhothorax coccinarum* from fragmentary osteoderms 130 years ago (Cope, 1875) not only has stood the test of time (Long and Ballew, 1985; Lucas and Hunt, 1992; Heckert and Lucas, 2000, 2002a; Lucas et al., 2002b), but, with his (Cope, 1881) use of the phytosaur "*Belodon*" *buceros* to correlate to the German Keuper, was also the first step in developing a testable biostratigraphic framework using Triassic tetrapods (Lucas and Hunt, 1993; Lucas and Heckert, 1996; Lucas, 1998, 2005). More than 125 years later, another aetosaur, *Desmatosuchus chamaensis*, would be discovered and described on the basis of even more distinct osteoderms (Zeigler et al., 2002a). This taxon has already demonstrated some use as a Revueltian index fossil, occurring in the Bull Canyon Formation of eastern New Mexico (Zeigler et al., 2002a) and the Painted Desert Member of the Petrified Forest Formation in Petrified Forest National Park (Stocker et al., 2004).

Crocodylotarsans more derived than aetosaurs and phytosaurs are surprisingly uncommon in the Painted Desert Member in the Chama Basin. Various "rauisuchian" specimens are in the Ghost Ranch collections and may have come from the Canjilon quarry and vicinity (Long and Murry, 1995). Fragmentary rauisuchian fossils, including both a juvenile and an adult femur broadly similar to that of *Postosuchus* have been recovered from the Snyder quarry (Zeigler et al., 2003e). To date, no other derived crurotarsans have been reported from the Painted Desert Member in the Chama Basin, with the possible exception of the specimen illustrated here in Figure 5C.

The Chama Basin has a remarkable dinosaur record. Of course, the Whitaker quarry (in the Rock Point Formation) is not part of the Painted Desert Member fauna, but it is worth noting that this is probably the richest single dinosaur locality in the world. The Painted Desert Member is also remarkably rich in dinosaurs compared to correlative strata in the rest of the American Southwest (e.g., Hunt et al., 1998; Heckert et al., 2000a). Significant dinosaur records from the Painted Desert Member in the Chama Basin are entirely of theropods, principally coelophysoids. These records began with the original type material of *Coelophysis* collected by Baldwin (Cope, 1887a,b, 1889; von Huene, 1915; Padian, 1986; Colbert, 1989; Sullivan et al., 1996; Sullivan and Lucas, 1999). Since then, additional theropods have been found around Orphan Mesa, including the holotype of *Eucoelophysis baldwini* (Sullivan et al., 1996; Sullivan and Lucas, 1999) and at the Snyder quarry, which is one of the few sites in the Chinle Group that yields multiple individuals of theropod dinosaurs (Heckert et al., 2000b, 2003b). Now, with the additional report of