

nally reported by Newberry (1876) and reviewed by Ash (1974). These are from abandoned copper mines (Minas de Pedro and Las Minas Jimmie) in El Cobre Canyon. Ash (1974) listed the flora as *Brachyphyllum* sp., *Pagiophyllum newberryi*, *Araucarioxylon arizonicum*, *Otozamites macombi*, *O. powelli* and *Zamites occidentalis*. These plants belong to the *Dinophyton* floral zone of Ash (1980), which occurs in strata of Otischalkian-Adamanian age throughout the Chinle Group (Lucas, 1997).

Salitral Formation

Lucas and Hunt (1992) and Hunt and Lucas (1993a) documented a small assemblage of tetrapod fossils from the Youngsville Member of the Salitral Formation at the formation type section. Besides coprolites and indeterminate metoposaurid and phytosaur remains, these fossils include a paramedian scute that they assigned to the aetosaur *Longosuchus* (Hunt and Lucas, 1990, fig. 3I-J) and a theropod dinosaur vertebra (Heckert et al., 2000a, fig. 3A-C) (Table 1). The presence of *Longosuchus* suggests an Otischalkian age, but Lucas et al. (2003a) concluded that the specimen is better assigned to *Desmotosuchus* as *D.* cf. *D. haplocerus*. This suggests an Adamanian age (cf. Heckert et al., 2003a). Recent collecting by us in the Salitral Formation reveals additional fragmentary fossils of phytosaurs, aetosaurs and metoposaurids (Lucas et al., 2003a).

Poleo Formation

Abundant pieces of petrified wood, mostly oxidized, are present in the Poleo Formation. Fragments of vertebrate bone, mostly

unidentifiable, are also present in some conglomerate beds of the Poleo. Thus, no biostratigraphically useful fossils are yet known from the Poleo Formation in the Chama Basin.

Petrified Forest Formation

In the Chama Basin, the unionid bivalves from the Painted Desert Member of the Petrified Forest Formation (Meek, 1875; Good, 1998; Lucas et al., 2003b) are of some biostratigraphic significance. Good (1993a,b, 1998) proposed a molluscan zonation of the Chinle Group consisting of two zones: the *Antediplodon graciliratus* zone of early Revueltian age, and the *A. thomasi* zone of late Revueltian age.

Unionids originally described by Meek (1875) from the Painted Desert Member of the Petrified Forest Formation near Gallina in the Chama Basin (Lucas and Hunt, 1992) pertain to taxa found elsewhere in Revueltian strata of the Chinle Group in New Mexico, Arizona and Utah (Good, 1998). So, the Painted Desert Member unionids from the Chama Basin are consistent with (though not demonstrative of) a Revueltian age based on vertebrate biostratigraphy.

A small, fragmentary vertebrate fossil assemblage was collected from the Mesa Montosa Member in its type area. It includes the Revueltian index taxa *Pseudopalatus buceros* and *Typhothorax coccinarum* (Lucas and Hunt, 1992).

A much more extensive Revueltian-age vertebrate fossil assemblage is present in the upper part of the Painted Desert Member at several locations and is reviewed in detail by Heckert et al. (this volume). Especially significant are: (1) Cope and Baldwin's localities near Gallina (Cope, 1875, 1877, 1881, 1887a,b, 1889; Lucas and Hunt, 1992; Hunt and Lucas, 1993a); (2) the Snyder quarry near Ghost Ranch (Heckert et al., 2000a, b; Zeigler, 2002; Zeigler et al., 2002a, b, 2003a; Heckert and Jenkins, 2005); (3) the Canjilon phytosaur quarry (Camp, 1930; Lawler, 1976; Long et al., 1989; Martz, 2002a, b; Hunt and Downs, 2002; Zeigler et al., 2002c); and (4) the Orphan Mesa area (Sullivan et al., 1996; Sullivan and Lucas, 1999). The tetrapod fauna of the Painted Desert Member (Table 1) includes the phytosaur *Pseudopalatus* and the aetosaurs *Desmotosuchus chamaensis* and *Typhothorax coccinarum*, index taxa of the Revueltian lfv.

Rock Point Formation

Pollen from the Rock Point Formation is considered to be of Norian age (Litwin, 1986; Litwin et al., 1991). The vertebrate fossil assemblage (Table 1) from the Whitaker quarry at Ghost Ranch includes *Redondasaurus*, an index taxon of the Apachean land-vertebrate faunachron (Hunt and Lucas, 1993b; Lucas et al., 1997).

Hunt and Lucas (1993a; also see Lucas 1998) suggested the Apachean is equivalent to the Rhaetian, largely based on a stage-of evolution correlation using phytosaurs. However, more recent data, especially the presence of the Norian aetosaur *Aetosaurus* in the Rock Point Formation (Small, 1998), suggest the unit is of Norian age. This brings the vertebrate biostratigraphy into

TABLE 1. Tetrapod faunas of the Chinle Group in the Chama Basin.

Salitral Formation (Youngsville Member):	
Metoposaur	<i>Buettneria</i>
Phytosaurs	Indeterminate
Aetosaur	<i>Desmotosuchus</i>
Dinosaur	Theropoda
Petrified Forest Formation (Painted Desert Member):	
Amphibians	Metoposauridae indet.
Phytosaurs	<i>Pseudopalatus buceros</i>
Aetosaurs	<i>Typhothorax coccinarum</i> <i>Desmotosuchus chamaensis</i>
Rauisuchians	<i>Postosuchus</i>
Theropod dinosaur	<i>Eucoelophysis baldwini</i>
Reptilia	<i>Cynodontia</i> <i>Lepidosauromorpha</i> <i>Dolabrosaurus</i>
Rock Point Formation:	
Phytosaur	<i>Redondasaurus bermani</i>
Archosauromorphs	<i>Vancleavea</i> <i>Drepanosaurid</i>
Rauisuchian	<i>Postosuchus kirkpatricki</i>
Theropod dinosaur	<i>Coelophysis bauri</i>