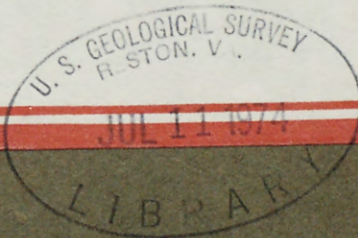


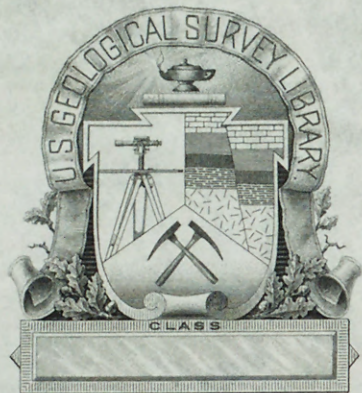
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AN ANNOTATED BIBLIOGRAPHY OF FAUNA AND FLORA

DESCRIBED FROM THE DOCKUM GROUP OF TRIASSIC

AGE IN EASTERN NEW MEXICO AND WEST TEXAS

By James C. Wright and Warren I. Finch, <sup>revised</sup> 1924-

Open-file report

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③ An annotated bibliography of fauna and flora described from the Dockum Group of Triassic age in eastern New Mexico and West Texas, by James C. Wright and Warren I. Finch. 26 p. 1012 Federal Bldg., Denver, Colo. 80202; 8102 Federal Office Bldg., Salt Lake City, Utah 84111; 602 Thomas Bldg., Dallas, Texas 75202.



On January 12, 1971, a map was open-filed entitled, "Geologic materials of the San Francisco Bay region," by J. Schlocker. The title has been changed to: "Generalized geologic map of the San Francisco Bay region, California."



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An annotated bibliography of fauna and flora described  
from the Dockum Group of Triassic age  
in eastern New Mexico and West Texas

By James C. Wright\* and Warren I. Finch

*INTRODUCTION*

This annotated bibliography was prepared by Warren I. Finch from a rough copy compiled by the late James C. Wright in either late 1967 or early 1968 as an aid to his understanding of the stratigraphic distribution of uranium deposits in Triassic rocks of the Southern High Plains. He did not finish it, inasmuch as several references listed are not annotated. Nevertheless, it is fairly complete for North American literature for years prior to 1967, but it does not contain any papers published in Europe, several of which are pertinent. A few papers on localities in Wyoming, the Colorado Plateau region, and Mexico are annotated for the purposes of generic and stratigraphic comparison. Wright collated many of the data; cross references are abundant.

The bibliography is presented as prepared by Wright; editing was held to a minimum. No additional check was made of the source materials for accuracy of the data--for example, spellings of fossil names. The stratigraphic nomenclature is that used in the reports cited and may or may not conform to that currently accepted by the U.S. Geological Survey. A list of non-annotated references cited in the annotations was added.

\*Deceased, August 1968



## BIBLIOGRAPHY

Baird, Donald, 1964, Dockum (Late Triassic) reptile footprints from New Mexico: Jour. Paleontology, v. 38, no. 1, p. 118-125.

Baird analyzes museum collections from the Cimarron valley, Union County, N. Mex.; from Peacock Canyon, sec. 30, T. 31 N., R. 34 E; and from the Allen Ranch in the same area. Collections are believed to be from the Sloan Canyon Formation. The footprints are compared to ones from the Brunswick Shale in the Newark Series because few footprints from the west are well described. The presence of sphenodontid rhynchocephalian reptiles is recognized from the New Mexico footprints, although no skeletal remains are known from the North American Triassic.

Baldwin, Brewster, and Muehlberger, W. R., 1959, Geologic studies of Union County, New Mexico--[pt. 1], Geology of Union County: New Mexico Bur. Mines and Mineral Resources Bull. 63, p. 1-107.

Bone fragments and teeth occur in sandy siltstone of the Sloan Canyon Formation of the Dockum Group near the northeast corner of Union County, about 32 miles north-northwest of the northwest corner of the Texas Panhandle, NW 1/4 sec. 12, T. 31 N., R. 35 E., and southeast corner of sec. 31, T. 32 N., R. 36 E. (p. 36).

Berry, E. W., 1924, Fossil plants and Unios in the red beds of Wyoming: Jour. Geology, v. 32, no. 6, p. 488-497.

A flora including *Equisetum*, and the cycad genera *Zamites* and *Pterophyllum*, is described from the Popo Agie red beds southwest of Lander. *Unio dumblei* is also present.

1927, Cycads in the Shinarump conglomerate of southern Utah: Washington Acad. Sci. Jour., v. 17, no. 11, p. 303-307.

Fronds and pinnules of a cycad collected by R. C. Moore from Garfield County, Utah, are described and assigned to *Otozamites powelli* Fontaine (1890). Berry believes *Zamites powelli* Fontaine (1890) should be reclassified as *Otozamites powelli* Fontaine.



Branson, E. B., and Mehl, M. G., 1929, Triassic amphibians from the Rocky Mountain region: Missouri Univ. Studies, v. 4, no. 2, 87 p.

Branson and Mehl review metoposaurid amphibians, classify them into five genera, and describe collections from Wyoming, Arizona, and New Mexico.

Brown, R. W., 1956, Palmlike plants from the Dolores Formation (Triassic), southwestern Colorado: U.S. Geol. Survey Prof. Paper 274-H, p. 205-209.

Casts of simple, elliptic to ovate, strongly pleated leaves as much as 16 inches long and 10 inches wide with 16 to 20 ribs parallel to the length and alternating with veinlets, but without the midrib differentiated, have been found near Placerville, Fall River, and [Saw Pit, San Miguel County] southwestern Colorado in the Dolores Formation of Late Triassic age. The stem is rounded and narrows from a 1 1/2-inch diameter to a blunt point within about 4 inches. These leaves and stems are assigned to the new genus and species *Sarmiguella lewisi*. The leaf character is not cycadlike, but more closely resemble the palms. If these leaves and stems are actually from a palm, the occurrences demonstrate development of angiosperms as early as in Late Triassic rather than during Jurassic time. Imprints of twigs of the conifer *Brachyphyllum münsteri* occur at the same localities. Older literature reports the presence of reptilian teeth, ganoid fishes, and mollusks.

Camp, C. L., 1930, A study of the phytosaurs with description of new material from western North America: California Univ. Mem., v. 10, 174 p.

Camp describes 105 lots of phytosaur remains from 46 localities in the Chinle Formation of Triassic age of Arizona, New Mexico, and Utah. Seven nearly complete skulls (five with lower jaws and other skeletal parts), 10 additional excellent skulls, 32 other skulls, and 27 other numbered skeletal lots, chiefly from localities between St. Johns and Holbrook and near Round Rock, all in northern Arizona are described. Camp briefly reviews (p. 4-6) the occurrence of phytosaurs outside this area. He supports Huene's (1927) interpretation that phytosaurs of differing specialization are probably of differing ages. He also notes that the Dockum contains both primitive genera like those of the Popo Agie and more specialized genera like those of the Chinle Formation. In conclusion Camp states that "The Dockum probably contains a number of horizons which have not yet been distinguished \* \* \*." (p. 6).



Case, E. C., 1914, The red beds between Wichita Falls, Texas, and Las Vegas, New Mexico, in relation to their vertebrate fauna: Jour. Geology, v. 22, p. 243-259.

Triassic rocks were distinguished from Permian rocks in 1912 by their differences in lithology and content of Unios and phytosaur bones. The Triassic rocks of Texas along the eastern rim of the Southern High Plains were traversed between Spur, Dickens County, and Crosbyton, Crosby County, in Blanco Canyon. About 125 feet of Triassic strata is present between Permian and Tertiary in Blanco Canyon (p. 248-249). The main vertebrate fossil horizon is a bed of white to light-brown clay less than 30 feet above the base of the sequence (a lower crossbedded sandstone assigned to Permian by Case may also be part of Triassic). A pebble conglomerate was noted at top of section [This was reported later (Case, 1928b) as the extensive "Dickens Member" of the Dockum. This member contains waterworn vertebrate bones where it overlies fossiliferous clay as in Blanco Canyon.]. The Triassic was also traversed to the north along Mott Creek near Lyman [west of Matador], Motley County; [detoured Quitaque Canyon] Clarendon, Donley County, Texas; and westward on the High Plains in New Mexico.

1920a, On a very perfect thoracic shield of a large labyrinthodont in the geological collections of the University of Michigan: Michigan Univ. Mus. Zoology Occasional Paper no. 82, 3 p.

Case describes thoracic plates of an amphibian in the Dockum beds on the Swenson Ranch [probably eastern Crosby County], western Texas, which are assigned to *Metoposaurus jonesi* [later referred to by Case (1920b, 1922) and Wilson (1941, p. 72) as *Buettneria*; and later referred to by Colbert and Imbrie (1956) as *Eupelor fraasi jonesi*].

1920b, Preliminary description of a new suborder of phytosaurian reptiles, with a description of a new species of *Phytosaurus*: Jour. Geology, v. 28, no. 6, p. 524-535.

The description of *Phytosaurus doughtyi* is based on a single partial skull in the collection of G. D. Doughy in Post, Texas [this skull came from the eastern Crosby County pits reported on in Case, 1920a, 1922, and 1929, p. 50-53; see Case, 1932b, p. 74]. The paper also contains a preliminary description of a new genus of amphibian.

Description of the new genus *Buettneria* is based on one skull and a partial skeleton from eastern Crosby County. [A fuller description is found in Case (1922) [see next reference] and further detail is found in Wilson (1941). See below in this report. The genus *Buettneria* is later referred to by Colbert and Imbrie (1956) as *Eupelor fraasi jonesi*.]

Case, E. C., 1922, New reptiles and stegocephalians from the Upper Triassic of western Texas: Carnegie Inst. Washington Pub. no. 321, 84 p.

Publication describes a vertebrate fauna from eastern Crosby County consisting of a new genera of metosposaurid amphibian, *Beuttneria perfecta*, based on one skull and a partial skeleton [referred to by Colbert and Imbrie (1956) as *Eupelor fraasi jonesi*]; a new genera of pseudosuchian reptile, *Desmatosuchus spurensis* [referred to by Gregory (1953) as *Desmatosuchus haplocerus*], based on one skull and a partial skeleton; a new genera of phytosaur reptile, *Promystriosuchus ehlersi* based on one skull [referred to by Gregory (1962b) as *Paleorhinus*]; two new species of phytosaurs, *Leptosuchus crosbiensis* and *Leptosuchus imperfecta* based on one skull each [referred to by Gregory (1962b) as *Rutiodon*]; and 20 free vertebrae of a small indeterminate dinosaur.

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1925, Some new specimens of Triassic vertebrates in the museum of geology of the University of Michigan: Michigan Acad. Sci., Arts, and Letters Papers, v. 4, p. 1, p. 419-423.

Case describes from unstated localities in the Dockum beds of western Texas the following fossil remains: (1) a fragmentary lower jaw of a phytosaur referred to *Leptosuchus crosbiensis*; (2) a large phytosaur skull reassembled from fragments referred to as *Leptosuchus imperfecta*; (3) an unusually large fragmentary lower jaw of a phytosaur; and (4) the upper portion of a skull of a very large stegocephalian amphibian referred to as *Buettneria perfecta*.

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1927a, The vertebral column of *Coelophys* Cope: Michigan Univ. Mus. [Paleontology] Geology Contr., v. 2, no. 10, p. 209-222.

The paper presents a more complete description of the vertebral column of a small dinosaur, first noted in Case (1922), from eastern Crosby County, Texas.



Case, E. C., 1927b, A complete phytosaur pelvis from the Triassic beds of western Texas: Michigan Univ. Mus. [Paleontology] Geology Contr., v. 2, no. 12, p. 227-229.

The paper presents a description of a complete phytosaur pelvis, part of which was found in 1920 (illustrated in Case, 1922, pl. 13, fig. B; p. 71, fig. 27C), and part of which was found in 1925, in eastern Crosby County. The pelvis belongs to the genus *Phytosaurus*.

1928a, An eudoerinal cast of a phytosaur from the Upper Triassic beds of western Texas: Jour. Comparative Neurology, v. 45.

Report not examined.

1928b, A cotylosaur from the Upper Triassic of western Texas: Washington Acad. Sci. Jour., v. 18, no. 7, p. 177-178.

Case announces the collection in 1927 of *Trilophosaurus buettneri*, which is described in Case, 1928c.

1928c, Indications of a cotylosaur and of a new form of fish from the Triassic beds of Texas, with remarks on the Shinarump conglomerate: Michigan Univ. Mus. Paleontology Contr., v. 3, no. 1, p. 1-14.

The anterior portion of a lower jaw with teeth of a small cotylosaur, found near Walker's Tank, Crosby County, is described and designated the type for the species *Trilophosaurus buettneri*. Case also describes and illustrates an unidentifiable small jaw fragment containing one tooth, probably of a fish collected in eastern Crosby County, which has tentatively been named *Xenognathus obscurus*. [The fish has since been renamed *Colognathus* (Case, 1933).]

Case tentatively attempts correlation of lithologic units from eastern Crosby County and Big Spring, Howard County, Tex., to northern New Mexico and Arizona. He correlates (p. 11-12) conglomerates of the Dockum Group, which are informally named "Dickens Member" in Case's field notes with the Shinarump Member of the Chinle Formation of the Colorado Plateau. [In Crosby County these conglomerates lie just below the Tertiary cap.] The "Dickens Member" is a heavy, coarse-grained, crossbedded siliceous brown or red sandstone. Locally, in eastern Crosby County, where the "Dickens Member" overlies a bluish or whitish bed of calcareous(?) sandstone with

siltstone pebbles, the member contains waterworn vertebrate bone fragments. Elsewhere in the "Dickens Member", hundreds of square miles of exposure of this conglomerate are faunally barren.

The principal fauna described from Crosby County comes from the underlying beds tentatively correlated by Case with the Moenkopi Formation of Early Triassic age. [These underlying beds are now known to contain a fauna nearly identical to that in the Popo Agie, lowermost Upper Triassic, of southern Wyoming].

Case, E. C., 1929, Description of the skull of a new form of phytosaur: Michigan Univ. Mus. Paleontology Mem., v. 2, 56 p.

Case describes, from a nearly complete skull, lacking jaws [See Case, 1930], and other fragmentary parts, the new genus and species *Brachysuchus megalodon* [referred to by Gregory (1962b) as genus *Phytosaurus*]. The skull is illustrated by excellent photographs and diagrams. The specimen was collected in 1927 from near Otis Chalk, Howard County, Tex., about 20 miles southeast of Big Springs. *Brachysuchus m.* is believed to differ significantly from *Mystriosuchus pleiningeri* Huene and from *Leptosuchus crosbiensis* Case [both of which Gregory (1962b) has referred to as separate genera]. Case (p. 41) believes that all phytosaurs from the western United States are from rocks of Late Triassic age and cannot (in 1929) be chronologically separated by either their phylogenetic development or physical stratigraphy. He refers to the contrary opinion of Huene (1927). A phytosaur pelvis and other elements were also collected.

The remains of *Brachysuchus m.* were embedded in a clay-pellet conglomerate, coated with clay--mostly deep red but partly reduced to light green, not rounded by abrasion of lengthy water transport, but rather apparently moved in a clayey flood wash and minutely fractured by postdepositional adjustment in the compacting mud. Separation of some skeletal elements from each other, local restricted concentrations of coprolites, teeth, and other small fragments sorted according to similar masses, and paucity of fish scales or teeth suggest dragging (not floating) of the cadaver and sorting action of very shallow flowing water. The excellent preservation is unlike that of vertebrates in the Shinarump and similar conglomerates where the bones and fragments are rounded by stream abrasion. Sparse dipnoan fish teeth, coelacanthid fish bones, fish scales, and Unio-like pelecypods are present.



Case, E. C., 1930, On the lower jaw of *Brachysuchus megalodon*:  
Michigan Univ. Mus. Paleontology Contr., v. 3, no. 8, p.  
155-161.

The author describes jawbones and teeth found in  
Howard County, Tex., two years after discovery of a  
perfect skull described in Case, 1929. [Referred to  
by Gregory (1962b) as *Phytosaurus megalodon*.]

\_\_\_\_ 1931a, Life models of the heads of two types of phytosaurs:  
Michigan Univ. Mus. Paleontology Contr., v. 3, no. 10, p.  
183-185.

The paper illustrates and discusses reconstructed  
life models of the heavy-boned, perhaps carnivorous,  
*Brachysuchus megalodon* [Case, 1929; referred to by  
Gregory (1962b) as *Phytosaurus*], from West Texas; and  
of lighter-boned, long, slender-jawed, perhaps fish-  
eating *Rhytidon carolinensis* [*Rutiodon* of Gregory,  
1962b] from North Carolina.

\_\_\_\_ 1931b, Descriptions of a new species of *Buettneria*, with a  
discussion of the brain case: Michigan Univ. Mus. Paleontology  
Contr., v. 3, no. 11, p. 187-206.

On the basis of seven skulls and much other skeletal  
material, Case describes a small species of metoposaurid  
amphibian *Buettneria bakeri* n. sp. [referred to by Colbert  
and Imbrie (1956) as *Eupelor frassi jonesi*], from a poorly  
sorted, coarse-grained, clay-chip-bearing sandstone at the  
base of the Triassic in Scurry County, Tex. [See Case (1932a,  
p. 1-3 for precise location.)]

Case, E. C., 1932a, A collection of stegocephalians from Scurry County, Texas: Michigan Univ. Mus. Paleontology Contr., v. 4, no. 1, p. 1-56.

A supplemental description is given for the metoposaurid amphibian *Buettneria bakeri* [referred to by Colbert and Imbrie (1956) as *Eupelor fraasi jonesi*] from the Elkins Place bone bed, sec. 32, block 4, H. and G. N. Survey Co., 23 miles north of Snyder, Scurry County [investigations made in 1967 indicate that the locality is on the property of Mr. P. L. Fuller near the central south edge of Kent County, and near the northeast end of the Cogdell oil field]. The Elkins Place bone bed is at the base of a locally thick conglomeratic sandstone, presumably at the base of the Triassic. The description is based on material collected in 1931 together with the original 1930 collections; this includes 10 complete or nearly complete skulls, 8 jaws, 6 complete ribs, 12 nearly complete interclavicles, 45 vertebral centra, and many limb bones. A biometric analysis of this large sample is given. The Museum also has two interclavicles and a jawbone from metoposaurids from Rotten Hill on Cerita de la Cruz Creek in Potter County, Texas. Excellent photographs of fossils from Scurry County include teeth not illustrated so clearly elsewhere. The Elkins Place bone bed includes four dinosaur teeth; a tooth, two vertebrae, and jaw fragments of phytosaurs; these remains (other than the *Buettneria* sample) occur near the top of the 26-inch-thick pebble conglomerate and show considerable wear. The *Buettneria* fossils lay in the basal 3 to 4 inches of the same conglomerate, at many points impressed into the red clay underneath it, and are in singularly perfect unworn condition. Coprolites, probably amphibian (presumably also from the conglomerate), contain ganoid fish scales and small bones probably of fish; no other fish remains were found. It is believed the *Buettneria* group were overwhelmed by a very sudden sandy mudflow due to a violent storm in a probably arid climate. The conglomerate contains cylindrical upright pipelike bodies, particularly near the fossils, which may be decayed roots, worm burrows, or gas vents from the buried decaying cadavers.



Case, E. C., 1932b, A perfectly preserved segment of the armor of a phytosaur, with associated vertebrae: Michigan Univ. Mus. Paleontology Contr., v. 4, no. 2, p. 57-80.

A 5-foot length of 26 rows of armor plates, the associated vertebrae, and the pelvis, all in virtually undisturbed position, of a phytosaur reptile 10-12 feet long are described. The bones were collected in 1931 from the breaks of Cerita de la Cruz Creek, northwest of Amarillo, Potter County, Texas. [This locality is considered to be in the Tecovas Formation (Maxwell, 1954).] Case considers the possible relation of the armor plates and vertebrae from Potter County to a pelvis (Case, 1929, p. 50-53) and a skull (Case, 1920b) from eastern Crosby County. In such an association, the form would be *Desmotosuchus*, but it is also possible to hypothecate a reconstruction that would be *Mystriosuchus*.

1932c, On the caudal region of *Coelophysis* sp. and on some new or little known forms from the Upper Triassic of western Texas: Michigan Univ. Mus. Paleontology Contr., v. 4, no. 3, p. 81-91.

Case describes 31 complete (and three half complete) tail vertebrae of a small dinosaur collected in 1931 from a purple clay in Potter County (probably Cerita de la Cruz Creek). It is assigned, like the vertebral column collected from eastern Crosby County (Case, 1927a), to *Coelophysis*. Dinosaur teeth and other small bone fragments from this and other west Texas localities are also described. A lower jaw and three teeth of a fish from Palo Duro Canyon are described. This fish, like similar material from eastern Crosby County (Case, 1928c), is assigned to *Xenognathus obscurus*. [Renamed *Colognathus* (Case, (1933).]

1933, *Colognathus* proposed for *Xenognathus* preoccupied: Washington Acad. Sci. Jour., v. 23, no. 1, p. 65.

Proposes genus name *Colognathus* for the preoccupied name (*Xenognathus*) used in Case (1928c), and notes occurrence of additional fragmentary jaws and teeth from Palo Duro Canyon as described by Case (1932c, p. 90).

1943, A new form of phytosaur pelvis: Am. Jour. Sci., v. 241, no. 3, p. 201-203.

Describes, but does not name, a partial pelvis discovered in eastern Crosby County, Texas by William J. Elliot of Spur in gray gypsiferous clay in the Dockum Group.

Case, E. C., 1946, A census of the determinable genera of the stegocephalia: Am. Philos. Soc. Trans., v. 35, pt. 4, p. 325-420.

An attempt is made to taxonomically classify labyrinthodontid amphibians from the Carboniferous, Permian, and Triassic of the entire world. Specific names, because of the fragmentary material generally studied, appear to have no value beyond identification of definite specimens. Metaposaurid stereospondyls, reviewed on p. 393, 398-399, include *Buettneria* from the Dockum beds of Texas, and other genera from the Popo Agie beds of Wyoming, the Chinle of Arizona, and the Middle Keuper from Germany. All these units are Upper Triassic.

Case, E. C., and White, T. E., 1934, Two new specimens of phytosaurs from the Upper Triassic of western Texas: Michigan Univ. Mus. Paleontology Contr., v. 4, no. 9, p. 133-142.

Describes two phytosaur skulls collected in 1931 from the breaks of Cerita de la Cruz Creek, 23 miles northwest of Amarillo, Potter County, which are classified as *Leptosuchus studei* n. sp. and *Brachysuchus megalodon* [referred to by Gregory (1962b) as *Rutiodon* and *Phytosaurus*, respectively].

Colbert, E. H., 1947a, Studies of the phytosaurs *Machaeroprotopus* and *Rutiodon* [Ariz., N.C.]: Am. Mus. Nat. History Bull., v. 88, art. 2, p. 53-96.

Detailed analyses are given for the two genera, based on fossils from Arizona and North Carolina respectively.

1947b, Little dinosaurs of Ghost Ranch [New Mexico]: Nat. History, v. 56, no. 9, p. 392-399, 427-428.

Popular descriptions are given of discovery, excavation, packing, and shipping of large blocks containing abundant remains of *Coelophysis* at Ghost Ranch [located between Abiquiu and Gallina, Rio Arriba County], N. Mex., by team from American Museum of Natural History in summer of 1947. The concentration of these remains of *Coelophysis*, a relatively light animal, probably occurred in the backwater or eddy of a stream. Fragmentary bones of phytosaurs were found in the excavation but remarkably few other fossils.



Colbert, E. H., 1948, Triassic life in the southwestern United States:  
New York Acad. Sci. Trans., ser. 2, v. 10, no. 7, p. 229-235.

Common forms of life in the Chinle of northern New Mexico and Arizona included the river, lake, and swamp dwellers: unionid mollusks, heavy-scaled ganoid fish and lungfish, the crocodile-like phytosaur reptile, *Machaeroprotopus*, and the labyrinthodont amphibian, *Eupelorus*. On the neighboring low uplands were ferns, forests of the conifer *Auracaria*, the small primitive dinosaur *Coelophysis*, the giant dicynodont reptile *Placerias*, and the pseudosuchian reptile *Typothorax*. The area was a low-lying flood plain with meandering sluggish streams, a warm tropical or subtropical climate, seasonal flooding and drying, and extensive thick volcanic ash falls. [The biota and interpretation of the Dockum Group of Texas is similar except that *Placerias* is not reported.] The biota of the Moenkopi Formation of Early Triassic age is also described in this transcript of an illustrated lecture published without pictures or references.

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1964, The Triassic dinosaur genera *Podokesaurus* and *Coelophysis*:  
Am. Mus. Novitates, no. 2168, 12 p.

Study of the large population of *Coelophysis* collected in 1947 from Ghost Ranch, N. Mex., reveals variability of the genus. The fossil from Massachusetts named *Podokesaurus* is transferred to *Coelophysis* because it is within the range of that genus.

Colbert, E. H., and Gregory, J. T., 1957, Correlation of continental Triassic sediments by vertebrate fossils, in Reeside, J. B. (Chmn.), Correlation of the Triassic formations of North America exclusive of Canada: Geol. Soc. America Bull., v. 68, no. 11, p. 1456-1467.

Table 2 (p. 1465) particularly notes primitive phytosaur fauna from West Texas (south of Panhandle) that is equivalent to fauna of Popo Agie. [More clearly stated in Gregory's annotations to stratigraphic columns of same report.]

Colbert, E. H., and Imbrie, John, 1956, Triassic metoposaurid amphibians: Am. Mus. Nat. History Bull., v. 110, art. 6, p. 399-452.

This article reviews all genera and species previously named in Europe and North America. It uses bivariate analysis to compare faunas from near Otis Chalk, Howard County, Tex.; from northwest of Amarillo, Potter County, Tex.; from near Lamy, N. Mex.; from northern Arizona; and from Wyoming. It concludes that, although the variations in skull proportions for the different local faunas show perceptible differences in growth trends (fig. 17), the overlap of characteristics between individuals is so large that all forms from the western United States should be assigned to one genera, and possibly to one species. The following taxonomy is recommended (p. 450):

*Eupelor* (Cope), 1968

*Eupelor durus* (Cope), 1866, from Newark Group of Pennsylvania and New Jersey.

*Eupelor fraasi fraasi* (Lucas), 1904, from Chinle Formation of Arizona, New Mexico, and Utah.

*Eupelor fraasi jonesi* (Case), 1922, from Dockum Group of Texas.

Synonyms: *Buettneria perfecta*, Case, 1922;

*B. bakeri*, Case, 1931; *B. howardensis*, Sawin, 1945.

*Eupelor browni* (Branson), 1905, from Popo Agie of Wyoming.

Cope, E. D., 1887, The dinosaurian genus *Coelurus*: Am. Naturalist, v. 21, p. 367-369.

Report not examined.

1888, A contribution to the history of the *Vertebrata* of the Trias of North America: Am. Philos. Soc., Proc., v. 24, p. 209-228.

Report not examined.

1889, On a new genus of Triassic Dinosauria [*Coelophysis*]: Am. Naturalist, v. 23, p. 626.

Report not examined.

Cope, E. D., 1892a, A contribution of the vertebrate paleontology of Texas: Am. Philos. Soc. Proc., v. 30, p. 123-131.

The pseudosuchian reptile *Episcoposaurus haploceras* [referred to by Gregory (1953) as *Desmotosuchus haploceras*] is described from abundant intermixed skull and skeletal fragments [of probably two forms] found in Triassic near Dockum, Dickens County, Texas [2 miles north of Dockum (Cummins, 1893)].

1892b, Report on paleontology of the Vertebrata: Texas Geol. Survey Ann. Rept., 3d (for 1891), p. 249-259.

Report briefly describes (Cope, 1892a) the pseudosuchian reptile *Episcoposaurus haploceras* [referred to by Gregory (1953) as *Desmotosuchus haploceras*] found by Cummins near Dockum [2 miles north of Dockum (Cummins, 1893)]. Notes also that fragments of metoposaurid amphibians are abundant.

1893, A preliminary report on the vertebrate paleontology of the Llano Estacado: Texas Geol. Survey Ann. Rept., 4th (for 1892), p. 11-87.

This is the first comprehensive account of the vertebrate fossils of the Triassic Dockum terrane (7 p.), as well as of the middle Cenozoic "Loup Fork beds," (30 p.) the Upper Cenozoic Blanco beds, and the Pleistocene "Equus beds" (13 p.).

Both the phytosaurian reptile *Beledon superciliosus* n. sp. [referred to by Gregory (1962b) as *Phytosaurus*] and the pseudosuchian reptile *Episcoposaurus haploceras* [referred to by Gregory (1953) as *Desmotosuchus haploceras*] are described from a large group of intermixed fragments of skull and skeletal parts found near Dockum, Dickens County, Texas. The pseudosuchid *Typothorax* from West Texas and metoposaurid amphibian *Eupelor* from near Dockum are listed. Two new species of a [supposed] dinosaur *Palaeoecetus* are described from teeth found in Palo Duro Canyon [but later Gregory (1962b, p. 680) referred them to the reptilian genus *Phytosaurus*].



Cummins, W. F., 1893, Notes on the geology of northwest Texas;  
Texas Geol. Survey Ann. Rept., 4th (for 1892), p. 177-238.

This report includes a journal-type account of a collecting trip with Cope for vertebrate fossils. Chief localities for Triassic fossils are located more closely (p. 212) than in Cope's publications. Fossils came from 2 miles north of Dockum, from near the headquarters of J. J. Ranch in Palo Duro Canyon, from the head of Tule Canyon, and from the Double Mountain Fork of the Brazos River near the east line of Garza County.

Daugherty, L. H., 1941, The Upper Triassic flora of Arizona, with a discussion of its geologic occurrence, by Howard Ralph Stanger: Carnegie Inst. Washington Pub. 526, Contr. Paleontology, 108 p.

A thorough well-illustrated report that gives a systematic description of flora and interpretation of paleogeologic environment of deposits at Petrified Forest National Monument where logs, leaves, cones, pollen, and roots [Daugherty, 1963] of fern, horsetails, cycads, ginkos, conifers, and other plants are found. Flora of other southwestern United States Triassic localities is reported briefly on p. 17-24.

*Araucarioxylon arizonicum*, *Woodworthia arizonicum*, and a frond of *Otozamites powelli* occur at Turners Ranch, 10 miles south of Alanreed, near McLean, Tex., in "reworked beds of the Dockum"; and *Otozamites* near Clarendon, Tex. Daugherty (p. 17) refers to Camp's interpretation that the greater part of the Dockum vertebrate fauna is more primitive than that of the Chinle and that the lower Dockum may be older than the Chinle.

1963, Triassic roots from the Petrified Forest National Park: Am. Jour. Botany, v. 50, no. 8, p. 802-805.

Report describes roots 1 to 4 mm in diameter found with a large log in a sandy bentonite of the Chinle Formation. The roots are assigned to the new genus and species *Araucariohiza joae*.

Fontaine, W. M., and Knowlton, F. H., 1890, Notes on Triassic plants from New Mexico: U.S. Natl. Mus. Proc., v. 13, p. 281-285.

Two new species, *Equisetum abiquiense* and *E. knowltoni*, are described from leaves in a white sandstone (the lower horizon or the new copper mine). A larger flora which includes *Zamites* and *Palyissa* is described from leaves in a slightly higher shale (the upper horizon or old copper mines). Wood from *Araucarioxylon* and from a possible conifer are described from the lower horizon. The locality is about 6 miles northeast of Abiquiu, and about 1,000 feet above the bed of the Chama River.

Gregory J. T., 1945, Osteology and relationships of *Trilophosaurus* [Triassic, W. Texas]: Texas Univ. Pub. 4401, p. 273-359.

A protosaurian reptile is described on the basis of a nearly complete articulated skeleton and an additional skull and other bones from Otis Chalk, Howard County, Tex., and is assigned to *Trilophosaurus buettneri* (Case).

1953, *Typothorax* and *Desmotosuchus*: Yale Peabody Mus. Postilla, no. 16, 27 p.

A pseudosuchian reptile collected by Cummins near Dockum in 1891 was described by Cope as *Episcoposaurus haplocerus* (1887); but it differs so much from the genotype *Episcoposaurus horridus* that it must be excluded from that genus. Case (1922) described *Desmotosuchus spurensis* from nearby eastern Crosby County. Both fossils are now recognized as specifically identical and (by priority) become *Desmotosuchus haplocerus*. The genotype material of *Typothorax* and of *Episcoposaurus*, both from Gallina, N. Mex., are redescribed and the latter also referred to *Typothorax*. *Typothorax meadei* (Sawin, 1947) is accepted as a valid species.

Gregory, J. T., 1957, Annotations 36 and 37 to central-western Texas and Panhandle Texas columns, in Reeside, J. B. (Chmn.), Correlation of the Triassic Formations of North America exclusive of Canada: Geol. Soc. America Bull., v. 68, no. 11, p. 1477-1478.

Most of the vertebrate fauna of the Dockum Group indicate a Late Triassic age. The phytosaurs seem most useful in zonation of the strata. "Primitive phytosaurs (*Paleorhinus* and *Angistorhinus*), found elsewhere only in the Popo Agie, occur in the Camp Springs Conglomerate near the base of the Dockum in Scurry County, Texas, in claystones several hundred feet above the base in Howard and Borden Counties, and a few specimens have been found in Crosby County \* \* \*. Phytosaurs, pseudosuchians, and amphibians from localities in Crosby County, from Palo Duro Canyon, and from the Canadian River Valley north of Amarillo, in Texas, all are closely similar to the fauna of the lower part of the Petrified Forest Member of the Chinle Formation near St. Johns, Holbrook, and Cameron, Arizona. The Canadian River localities are in shale typical of the Tecovas Formation, and there is good reason to regard the other localities mentioned as probably belonging to that unit \* \* \*. More advanced phytosaurs, comparable to those of the upper levels of the Chinle in the Petrified Forest area and to those of the Chama region in northern New Mexico, are present in the upper part of the 'Chinle' portion of the Dockum near Tucumcari, New Mexico, but below the Redonda. No vertebrates so advanced as these have been found in Texas. They are associated with sandstones which may be correlatives of the Trujillo in Texas." (p. 1477).

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1962a, The relationships of the American phytosaur *Rutiodon*: Am. Mus. Nat. History Novitates, no. 2095, 22 p.

*Rutiodon carolinensis* is described on basis of numerous skulls, teeth, and skeletons from the Deep River and Dan River basins of North Carolina, and some material from Pennsylvania and New Jersey. Gregory states (p. 19-20) that *Leptosuchus* of western Texas should be referred to *Rutiodon*. *Paleorhinus* and *Angistorhinus* from Popo Agie and lower Dockum appear to be most primitive phytosaurs; *Rutiodon* from the east coast intermediate; and *Rutiodon zunii* from the Chinle most advanced (p. 20-21). [See Gregory, 1962b.]



Gregory, J. T., 1962b, The genera of phytosaurs: Am. Jour. Sci., v. 260, no. 9, p. 652-690.

Gregory classifies the Late Triassic phytosaurs of Texas, Wyoming, Arizona, North Carolina, and Germany into five genera and interprets their phyllogenetic relationships. Four genera recognized in North America, from primitive to specialized, are known from the Dockum of West Texas. Gregory assumes the entire Dockum is essentially of one age and that the primitive genera were contemporaneous with, rather than predecessors of, the more specialized genera. A synonymy of previously used generic names is given (p. 668), and comprehensive lists occurrence (with geographic and stratigraphic location) are provided for each recognized genus.

Huene, F. R. von, 1927, Notes on the age of the continental Triassic beds in North America, with remarks on some fossil vertebrates: U.S. Natl. Mus. Proc., v. 69, art. 18, 10 p.

The author notes (p. 5-8) the presence of both very primitive and advanced forms of phytosaurs in the Dockum of West Texas and speculates that they may not be of the same age. [See comments by Camp (1930).]

Irving, E., and Brown, D. A., 1964, Abundance and diversity of the labyrinthodonts as a function of paleolatitude: Am. Jour. Sci., v. 262, no. 6, p. 689-708.

Labyrinthodont amphibia were most abundant (in number of specimens found) and diverse (in recorded genera) at paleolatitudes of less than 30°. This control was more marked in late Carboniferous and Permian than in Triassic. West Texas is interpreted (table 2, no. 3) as being at 3° N. paleolatitude in Triassic, on the basis of paleomagnetic studies in the Colorado Plateau and the northeastern Newark Series (fig. 2).

Knowlton, F. H., 1888, New species of fossil wood (*Araucarioxylon arizonicum*) from Arizona and New Mexico: U.S. Natl. Mus. Proc., v. 11, p. 1-4.

This new species is described from three logs 6 to 11 feet long and more than a foot thick collected in 1879 by U.S. Infantry troops at the request of Gen. Sherman for display at the Smithsonian. One is from 2 miles north of Fort Wingate, N. Mex. (troop barracks); and two from Lithodendron Wash (Petrified Forest National Park, Ariz.). Knowlton thought the host strata probably Cretaceous; Major Powell believed it Jurassic.

Langston, Wann, Jr., 1949, A new species of *Paleorhinus* from the Triassic of Texas: Am. Jour. Sci., v. 247, no. 5, p. 324-241.

*Paleorhinus scurriensis* is described on the basis of one incomplete skull collected in 1937 at the H. G. Bryan farm 2 1/2 miles northeast of Camp Springs from a white, brown-weathering, fine to coarse sandstone and conglomerate at the base of the Dockum. This basal unit was named Camp Springs Conglomerate (Beede and Christner, 1926).

McLaughlin, T. G., 1954, Geology and ground-water resources of Baca County, Colorado: U.S. Geol. Survey Water-Supply Paper 1256, 232 p.

Triassic fossils are reported in the Dockum Group in Cimarron County, Okla., and Baca County, Colo. (p. 85).

Maxwell, G. L., 1954, Triassic of Potter County; Triassic fossil locale [Texas], in Panhandle Geol. Soc., [Guidebook] Spring Field Trips Apr. and May, 1954: p. 15-21.

Road log from Amarillo to West Amarillo Creek, Tecovas Creek, and Sierrita de la Cruz Creek is given. Fossils from the Tecovas Formation at the vertebrate fossil quarry discovered in the latter creek in 1926 by Floyd V. Studer are described. Case and White (1934) describe in detail two species of phytosaurs *Leptosuchus studeri* [referred to by Gregory (1962b) as *Rutiodon*] and *Brachysuchus megalodon* [referred to by Gregory (1962b) as *Phytosaurus*] from this quarry. Case (1932a) also reported a metoposaurid amphibian, *Buettneria perfecta* [referred to by Colbert and Imbrie (1956) as *Eupelor fraasi jonesi*] and skeletal fragments of an small indeterminate dinosaur. The pelecypod *Unio*, fish fragments, fossil wood, and (from a site 1 1/2 miles northeast of the vertebrate quarry) cycad leaves have also been found in the area.

Mehl, M. G., 1922, A new phytosaur from the Trias of Arizona: Jour. Geology, v. 3, p. 144-157.

Mehl describes a skull in the Walker Museum, University of Chicago, collected from the Triassic System near Santa Rosa, Guadalupe County, N. Mex. He defines it as *Machaeroprotopus andersoni* and compares it to *M. validus* from Arizona (Mehl, 1916). [Gregory (1962b) refers to both species as the genus *Rutiodon*.]

Mosher, L. C., 1967, Evolution of Triassic platform conodonts [abs.]: Geol. Soc. America, Program 1967 Ann. Mtg., p. 156-157. [Also published in 1968 in Abstracts for 1967: Geol. Soc. America Spec. Paper 115, p. 156-157.]

Conodonts in well-preserved material from both western North America and Europe are described. Some forms evolved regularly in Late Triassic and were widespread geographically; so they may be of use in world-wide correlation.

Panhandle Geol. Soc., 1954, [Guidebook] Spring Field Trips, Fossil and early man sites in the Texas Panhandle, Apr. 24, and May 1, 1954: 32 p.

Access to a vertebrate fossil locality in the Triassic near the head of Palo Duro Canyon, Randall County, Texas is described (p. 4-6).

1958, (Leader, F. V. Studer) [Guidebook] Field trip to Saddleback Pueblo and Rotten Hill Triassic fossil site, Oldham County, Texas, Nov. 1, 1958; 18 p.

Road log from Amarillo to Rotten Hill fossil site in easternmost Oldham County, same locality described by Maxwell (1954), is given. Most of the vertebrate fossils occur in purplish claystone.

Parker, B. H., 1933, Clastic plugs and dikes of the Cimarron Valley area of Union County, New Mexico: Jour. Geology, v. 41, no. 1, p. 38-51.

Reptilian footprints are reported in upper part of Dockum Group in northern Union County in the SW 1/4 sec. 19, T. 31 N., R. 34 E. (p. 42). Fragmental fish teeth and bones occur at several places in the Triassic.



Romer, A. S., 1947, Review of the Labyrinthodontia: Harvard Coll. Mus. Comp. Zoology Bull., v. 99, no. 1, 368 p.

Romer reviews general classification and morphology of labyrinthodont amphibians (p. 7-80), gives own classification (p. 304-319), summaries stratigraphic occurrence (p. 319-345), and lists about 350 references from 1857 to 1944. He classifies (p. 314) the following Upper Triassic forms as *Metoposauridae* (superfamily Brachyopoidea, suborder Stereospondyli, order Temnospondyli, superorder Labyrinthodontia, subclass Apsidospondyli): *Metoposaurus* from Europe; *Buettneria* from Dockum of West Texas; *Anaschisma* from Popo Agie of Wyoming; and Chinle of Arizona; *Dictyocephalus*, *Eupelor*, and possibly *Calamops* (p. 343) from the Newark of eastern United States; and three genera from India. Romer points out (p. 244 and 343) that distinction of American genera is questionable. *Buettneria* (p. 243-249) is the best known form from the thorough descriptions of Case, Sawin, and Wilson, but *Anaschisma* from the West was described earlier, and the eastern United States forms even before that.

Sawin, H. J., 1945, Amphibians from the Dockum Triassic of Howard County, Texas: Texas Univ. Pub. 4401, p. 361-399.

A metoposaurid amphibian assigned to *Buettneria howardensis* n. sp. [referred to by Colbert and Imbrie (1956) as *Eupelor fraasi jonesi*] is described on the basis of a dozen skulls and a partial skeleton from Otis Chalk. See Gregory (1945) for additional locality data and report on associated reptilian fauna.

\_\_\_\_\_, 1947, The pseudosuchian reptile *Typothorax meadei* [Dockum Triassic, Texas]: Jour. Paleontology, v. 21, no. 3, p. 201-238.

*Typothorax meadei* n. sp. from one skull and other skeletal elements of two individuals is described. These nearly complete pseudosuchians are found 3 miles north of Otis Chalk, Howard County, Tex., in the Dockum at the same locality and stratigraphic level as dissociated skeletal parts of plesiosaurs *Promystriosuchus*, *Brachysuchus*, and *Angistiorhinus* [referred to by Gregory (1962b) as *Paleorhinus*, *Phytosaurus*, and *Angistiorhinus*, respectively]. The protosaurian *Trilophosaurus*, the amphibian *Buettneria* [referred to by Colbert and Imbrie, 1956) as *Eupelor fraasi jonesi*], the small dinosaur *Coelophysis*, ganoid fish scales, and Unios also occur here. *Typothorax* is interpreted as a scavenger because of its association with these fragmental remains (see Case, 1929).

Schaeffer, Bobb, and Dunkle, D. H., 1950, A semionotid fish from the Chinle Formation, with consideration of its relationships: Am. Mus. Novitates, no. 1457, 29 p.

Describes and discusses a fish *Semionotus kanabensis* from near Kanab, Utah. The introduction (p. 2) reviews fish reported from the Dockum of Crosby County: *Ceratodus dorathea* reported by Case (1921); *Ceratodus crosbiensis* reported by Warthin (1928), and a coelacanth probably wrongly referred by Warthin (1928) to *Macropoma*.

Schaeffer, Bobb, and Gregory, J. T., 1961, Coelacanth fishes from the continental Triassic of the western United States: Am. Mus. Novitates, no. 2036, 18 p.

Describes all coelacanth fish known by the authors to have been collected from the Moenkopi, Chinle Formations, and Dockum Group since the description by Warthin (1928) of *Macropoma* collected by Case from the Dockum of Crosby County in 1925. One other badly weathered skull of a large coelacanth (unnamed, compared to *Whitea*) has been found in sandstone float of the Dockum near the head of Palo Duro Canyon in Sunday Creek, Randall County, Tex. The vertebrate fossils of Crosby County are mostly from an irregular, lenticular zone near the base of the Dockum, most commonly from purplish claystone underlying thin limestone beds which are believed to be ancient pond fillings.

Scott, R. A., 1960, Pollen of *Ephedra* from the Chinle Formation (Upper Triassic) [Arizona] and the genus *Equisetosporites*: Micropaleontology, v. 6, no. 3, p. 271-276.

Pollen of the living genus *Ephedra* is described from a coaly layer in sandstone at the base of the Upper Triassic Chinle Formation of Circle Cliffs, Garfield County, Utah. The holotype and only specimen of *Equisetosporites chinleana* Daugherty (1941) from the lower Chinle in the Petrified Forest National Monument, Ariz., is recognized as the same species and referred to this genus under the new combination *Ephedra chinleana*. This species is also recognized in samples from the lower Chinle Formation in the Capitol Reef area, Wayne County, Utah, and from Elk Ridge, San Juan County, Utah. The pollen is about 0.05 mm diameter and excellent photomicrographs given.

Scott, R. A., 1961, Fossil woods associated with uranium on the Colorado Plateau, *in* Short papers in the geologic and hydrologic sciences: U.S. Geol. Survey Prof. Paper 424-B, p. B130-B132.

All coalified wood from the Upper Triassic of the Colorado Plateau is of a single species: *Araucarioxylon arizonicum* Knowlton. Uranium content in this species at Temple Mountain ranges widely from 0.0005 to 5.8 percent. Scott concludes "that factors in the depositional environment at the time of mineralization, other than affinities [species of wood or component preserved] of plant material" caused the variation. The large size of *Araucarioxylon* trunks may favor their preservation more readily than wood of other major groups that are known from the Upper Triassic by their spore, pollen, and leaves. Thin sections of some specimens of megascopically amorphous "asphaltite" from Temple Mountain show remnants of original wood structure. When thin sections are ground sufficiently thin intrusion of apparently amorphous asphaltite from the coalified areas into silicified zones can be seen.

Scott, R. A., Barghoorn, E. S., and Leopold, E. B., 1960, How old are the angiosperms?: *Am. Jour. Sci.*, v. 258-A (Bradley Volume), p. 284-299.

The authors cite *Sarmiguelia* Brown (1956) from Dolores Formation with distinctly palmlike gross structure as "most arresting evidence of the megascopic remains of putative pre-Cretaceous angiosperms which has yet been described." The plaited, multiribbed leaves do not resemble any known early Mesozoic plant, but lacking any vestige of organic material in the fossils for anatomical study, and recognizing wide range of structure in the "cyadophyte" line, the authors suggest it be regarded as a cycadeoid.

Silva-Pineda, Alicia, 1961, Paleontología del Triásico Superior de Sonora--Pt. 2, Flora fósil de la formación Santa Clara (Carnico) del Estado de Sonora: *México Univ. Nac. Autónoma Inst. Geología Paleontología Mexicana*, no. 11, 36 p.

A flora of 12 species from fronds and pinules collected in central Sonora (about 200 miles south of Tucson) from an Upper Triassic unit is described.



Simpson, C. T., 1896, Description of four new Triassic unios from the Staked Plains of Texas: U.S. Natl. Mus. Proc., v. 18, no. 1072, p. 381-385.

Simpson describes four new species of the genus *Unio* from well-preserved fossils (collected by Cummins, 1891, p. 425-426) that were submitted by the Texas State Geologist, E. T. Dumble, from localities in Dickens and Garza Counties. *Unio subplanatus* from Duck Creek; *Unio dumblei* from head of Duck Creek and from 5 miles northeast of Dockum; *Unio graciliratus* from Headquarters 21 Ranch at head of Duck Creek south of Spur, Dickens County, and imperfect specimens from southeast corner of Garza County are described. *Unio dockumensis* is described from the following localities: southeast corner of Garza County; from a windmill 3 miles north of Dockum; from a tank north of Double Mountain River; and from the head of Duck Creek.

Sternberg, C. W., 1941, An incomplete *Buettneria* skull from the Dockum beds of Texas: Jour. Paleontology, v. 15, p. 424.

Describes one skull (University of Chicago, Walker Museum Number 1586) from "Home Creek pasture, 20 miles west of Spurr, Texas."

Stovall, J. W., 1943, Mesozoic stratigraphy in Geology and ground water resources of Cimarron County, Oklahoma: Oklahoma Geol. Survey Bull. 64, p. 43-100.

A fragmentary jawbone of a phytosaur and a fragmentary interclavicle of an amphibian were found near the mouth of Trujillo Creek near south-quarter corner, sec. 7, T. 5 N., R. 6 E.

Stovall, J. W., and Savage, D. E., 1939, A phytosaur in Union County, New Mexico, with notes on the stratigraphy: Jour. Geology, v. 47, no. 7, p. 759-766.

*Machaeroprotopus* is described from skull, jaws, and dermal scutes, collected from the Sloan Canyon Formation at Sloan Creek, near the highway 11 miles west of Kenton, Okla. Unios and gastropods are present about 15 feet lower.

Stovall, J. W., and Wharton, J. B., Jr., 1936, A new species of phytosaur from Big Spring, Texas: Jour. Geology, v. 44, no. 2, pt. 1, p. 183-192.

Authors describe *Angistorhinus alticephalus* based on one partial skull and incomplete skeleton collected from dark-brownish-red clay beneath a conglomerate at the Roy Lamb Ranch (1931), 25 miles south and east of Big Spring [probably near Otis Chalk, Howard County], Tex. Study was done at University of Oklahoma.

Warthin, A. S., Jr., 1928, Fossil fishes from the Triassic of Texas: Michigan Univ. Mus. Paleontology Contr., v. 3, no. 2, p. 15-18.

Warthin describes a left palatal tooth plate and a small skull fragment assigned respectively to the new species *Ceratodus crosbiensis* and to the coelacanthid, *Macropoma* sp. Both specimens were collected in 1925 from Walker's Tank, Crosby County.

Wilson, J. A., 1941, An interpretation of the skull of *Buettneria*, with special reference to the cartilages and soft parts: Michigan Univ. Mus. Paleontology Contr., v. 6, no. 5, p. 71-111.

A precise study of the skulls of the stegocephalian amphibians, *Buettneria perfecta* (Case, 1922) and *B. bakeri* (Case, 1931b) is reported.

\_\_\_\_ 1948a, A small amphibian from the Triassic of Howard County, Texas: Jour. Paleontology, v. 22, no. 3, p. 359-361.

A poorly prepared labyrinthodont skull and lower jaw is described as a new species *Latiscopus disjunctus*. It was collected from the *Trilophosaurus* quarry in Howard County, Tex. (Quarry 1, southeast corner sec. 58, block 29, Waco and Northeastern Railroad Company Survey, about 3 miles north of Otis Chalk).

\_\_\_\_ 1948b, Cope's types of fossil fishes in the collection of the Bureau of Economic Geology, The University of Texas: Jour. Paleontology, v. 22, no. 3, p. 368.

One-page listing reports types described by Cope:

*Deltodus planidens* Cope (1894)  
*Macromesodon diastematicus* Cope (1894)  
*Macromesodon dumblei* Cope (1892)

Wilson, J. A., 1950, Cope's types of fossil reptiles in the collection of the Bureau of Economic Geology, The University of Texas: Jour. Paleontology, v. 24, no. 1, p. 113-115.

Very briefly lists type material of phytosaur teeth still available at University of Texas, Austin. "All of the specimens which are unequivocally types are, in the author's opinion, too fragmentary to be determined specifically." Neither locality nor stratigraphic data reported. Bibliography provided.

#### NON-ANNOTATED REFERENCES CITED

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Case, E. C., 1921, A new species of *Ceratodus* from the Upper Triassic of Western Texas: Michigan Univ. Mus. Zoology Occasional Paper No. 101, 2 p.

Cummins, W. F., 1891, Report on the geology of northwestern Texas: pt. 1, Stratigraphic geology: Texas Geol. Survey Ann. Rept. 2d, (for 1890), p. 357-552.

Mehl, M. G., 1916, New or little-known reptiles from the Trias of Arizona and New Mexico, with notes on the fossil-bearing horizons near Wingate, New Mexico: Oklahoma Univ. Bull., New Ser. No. 103, Univ. Studies Ser. No. 5, p. 5-24.



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