DECEMBER 1965
Volume 25, Number 12
$2.00 PER YEAR • $0.25 PER COPY

OKLAHOMA GEOLOGY NOTES

ROBERT THOMAS HILL

OKLAHOMA GEOLOGICAL SURVEY • THE UNIVERSITY OF OKLAHOMA • NORMAN, OKLAHOMA

Cover Picture

ROBERT THOMAS HILL

Robert T. Hill, the great reconnaissance geologist, is known throughout the world for his publications on the Cretaceous System, especially the Lower Cretaceous, or Comanchean Series, of the southwestern United States, Mexico, West Indies, and Central America. Six articles relating to Oklahoma were published between 1888 and 1895 and included such subjects as the Trinity Formation, explorations along the Red River, the Ouachita Mountains, and artesian water.

Hill's study of the outcrops of the Comanche south of the Ouachita and Arbuckle Mountains resulted in a report entitled *Geology of Parts of Texas, Indian Territory, and Arkansas Adjacent to Red River,* published in 1894. His manuscript map for this report, drawn with pen and ink, was presented to his close friend, C. N. Gould, founder of the Oklahoma Geological Survey.

Dr. Hill gave the following names to formations exposed in Oklahoma: Tishomingo Granite, Trinity Sand, Goodland Limestone, Kiamichi Formation, Woodbine Sand, Eagle Ford Shale, and Bingen formation. The type localities of the Tishomingo, the Goodland, and the Kiamichi are in the State.

As early as the 1870's, Hill, then a young man working for a newspaper, *The Comanche Chief,* became interested in geology. On Round Mountain, 7 miles west of Comanche, Texas, he first found fossil shells. From the white limestones there exposed, he expanded and worked out the Comanche Series.

Hill was a student of all the earth sciences. His lively curiosity led him to study geology, paleontology, history, physiography, hydrology and archaeology. He was graduated from Cornell University in 1886, joined the U. S. Geological Survey, and helped to establish the Texas Geological Survey when, in 1888, he became an assistant professor of geology at The University of Texas. In 1892 he returned to the Federal Survey in Washington where he remained until 1903 when he resigned to become a consulting geologist in New York City until 1911.

In later years he lived in Los Angeles and Dallas. His bibliography of 330 titles includes the classic *Geography and Geology of the Black and Grand Prairies of Texas.* His death in 1941, when he was 83 years old, closed a brilliant career. His ashes were scattered over Round Mountain in fulfillment of his desire.

Sources drawn upon for this article are a memorial by T. W. Vaughan, published in the Proceedings Volume of the Geological Society of America for 1943 and a memorial by C. N. Gould, published in the Proceedings of the Oklahoma Academy of Science for 1941. The photograph shown on the cover was recently donated to the Division of Manuscripts of the Bizzell Memorial Library of The University of Oklahoma by Dr. Don B. Gould, Geophoto Service, Inc., Denver, Colorado.

—E. L. F.

Oklahoma Board on Geographic Names

Carl C. Branson

For some years the U. S. Board on Geographic Names, originally formed in 1890, has wisely sought local help. The Oklahoma State Legislature of 1965 assigned to the Oklahoma Geological Survey the duty to "act as the Oklahoma Board on Geographic Names and make recommendations to the United States Board on Geographic Names" (HB 810, sec. 310 (b), (4)). The Federal board consists of 12 members, representing State, Army, Navy, Post Office, Interior, Agriculture, Commerce, Printing Office, Library of Congress, Air Force, Defense, and Central Intelligence Agency. The executive secretary is J. O. Kilmartin, for domestic geographic names. Donald J. Orth, chief, Geographic Names Section, U. S. Geological Survey, visited in October and clarified the activities of a board.

The newly formed Oklahoma Board on Geographic Names is starting out with five members: Dr. C. C. Branson, director of the Oklahoma Geological Survey, chairman; Muriel Wright of the Oklahoma Historical Society; Dr. Arrell M. Gibson, curator of the Phillips Collection of The University of Oklahoma; Dr. John J. Hidore, Department of Geography of Oklahoma State University; and Dr. John W. Morris, Department of Geography of The University of Oklahoma.

The board will proceed cautiously. It is easy to make a learned decision, but this decision means nothing if the name is not accepted by the residents of the area. The Federal board has made but 62 decisions on Oklahoma names, of which five are revisions of earlier decisions and three are considered erroneous (Branson, 1965). The need for a local board is obvious.

Current desired decisions are:

- Granite Gap: certainly should be Grants Gap (Hendricks, Knechtel, and Bridge, 1937, p. 23).
- Comet Creek: an involved situation dating from the Pacific Railroad Expedition.
- Bokchito Creek: two creeks currently so named, one in Bryan County and one in Choctaw County.
- Pharoah: not Pharaoh, the correct spelling if it were a Biblical name, but it appears to have been named for O. J. Pharoah (Shirk, 1965, p. 166).
- Gypsum Creek: not Boggy Creek. Currently on the Decision Docket No. 83.
- Tesesquite Creek: no information on origin or correct spelling. Similar to Texas name Tequesite Creek.
- Keyes: not Keys. T. 4 N., R. 7 ECM, Cimarron County. Originally Willowbar post office "name changed to Keyes on October 15, 1926. Named for Henry Keyes, president of the Santa Fe Railway" (Shirk, 1965, p. 116).

A large program of topographic mapping is under way: one 15-minute quadrangle, 179 7.5-minute quadrangles in progress, 64 selected.

The Oklahoma board is considering the several hundred names involved in order to help in preventing printed errors on the maps. Largely because there has been no state board, such errors as Roger County, Oolagah, Granite Gap, and Choteau have appeared. In Rogers County is Oowala Township, variously spelled Oawala, Oo-wa-la. Round Mountain is apparently the same as Catoos Hill, Old Catoos.

Such trite and overused names as Sand Creek, Sandy Creek, Walnut Creek, Blue Hill, Bitter Creek, Squaw Creek, and Dry Creek should be eliminated if distinctive and locally acceptable names can be found.

The Federal board issues "dockets" which give notice of pending decisions. The current ones are Grand Lake O'The Cherokees (objected to by me because it is long and the name of the river is Neosho), Gypsum Creek instead of Boggy Creek (Jackson County), and Breckinridge (not Breckenridge). A good sign of acceptance for the Oklahoma board is the fact that it was consulted on the naming of Lake Thunderbird about three weeks before the name was announced. Because the name was the winning entry in a contest and was confidential, I acted for the board and wrote that "we do not object."

Oklahoma Geological Survey is preparing maps and reports on Lincoln, Rogers, Bryan, Woodward, Payne, Canadian, McIntosh, Pushmataha, Custer, Wagoner, and Noble Counties and hopes to use distinctive, authentic, and acceptable names on its maps. The formation of a State Board on Geological Names should help it to do so.

References

Branson, C. C., 1965, Decisions on Oklahoma place names: Okla. Geol. Survey, Okla. Geology Notes, vol. 25, p. 82-85.

Gould, C. N., 1933, Oklahoma place names: Univ. Okla. Press, 146 p.

Hendricks, T. A., Knechtel, M. M., and **Bridge, Josiah**, 1937, Geology of Black Knob Ridge, Oklahoma: Amer. Assoc. Petroleum Geologists, Bull., vol. 21, p. 1-29.

Morris, J. W., 1965, Historical atlas of Oklahoma: Univ. Okla. Press, 70 maps, 26 p.

Shirk, G. H., 1965, Oklahoma place names: Univ. Okla. Press, 233 p.

Serpula IN THE CADDO LIMESTONE OF CHOCTAW COUNTY

CARL C. BRANSON

The generic name *Serpula* is used for a vast variety of fossils of tube-building Polychaeta and was described from a modern species. The geologic range is given as Silurian to Recent. Cretaceous species are numerous, but individual specimens are few. Twenhofel described

Figure 1. Serpula cragini? **(OU 4550), x4, from the Caddo Limestone of Choctaw County, Oklahoma.** (Photograph by) Phillip W. Blackwell)

S. cragini from the Champion Bed of the Kiowa Shale near Belvidere, Kiowa County, Kansas (1924, p. 52, pl. 7, fig. 1). Winton and Adkins (1919, p. 58) listed *Serpula* sp. from the Fort Worth Limestone of Texas. Gibbs (1950, p. 42) listed *Serpula cragini* from the Washita Group in SW¼ sec. 1, T. 7 S., R. 19 E., Choctaw County, Oklahoma.

A specimen of *Serpula* attached to a specimen of *Macraster* (fig. 1) was collected from the beds of the Caddo Limestone, which is equivalent in age to the Fort Worth Limestone. The specimen was collected by me in the east bank of Bokchito Creek 100 yards south of the Frisco railway bridge (SE¼ SW¼ sec. 18, T. 6 S., R 16 E., Choctaw County, Oklahoma), a locality shown to me by Allen Graffham and R. O. Fay.

The specimen is entirely cemented to the surface of the echinoid. It is incomplete but is looped so as to make a nearly circular specimen 1.3 cm in diameter. The tube is 1 mm in diameter. The small narrow unit at the right in the figure appears to be the immature portion, a portion observed in few specimens.

The specimen is best referred with doubt to *S. cragini*, the species described from the Kiowa Shale of Kansas.

References Cited

Gibbs, H. D., 1950, A field study of the Goodland Limestone and the Washita Group in southeastern Choctaw County, Oklahoma: Okla., Univ., unpublished Master of Science thesis, 72 p.

Twenhofel, W. H., 1924, The geology and invertebrate paleontology of the Comanchean and "Dakota" formations of Kansas: Kans., State Geol. Survey, Bull. 9, 135 p.

Winton, W. M., and **Adkins, W. S.**, 1919 [1920], The geology of Tarrant County [Tex.]: Texas, Univ., Bull. 1931, 122 p.

Ephedran Pollen Grains in Pleistocene Sediments of Central and Southeastern Oklahoma*

T. A. Bond

INTRODUCTION

Ephedran pollen of unknown origin occurs in Pleistocene clay in the terrace deposits of the Washita River in central Oklahoma and of the Red River in southeastern Oklahoma. The following may account for these occurrences: (1) the pollen grains are from extant species of *Ephedra* growing in the drainage basins of the two rivers, or (2) the grains are from extinct species preserved in older sediments, particularly Permian, Triassic, or Cretaceous of western Oklahoma and Texas, and recycled into the younger Pleistocene sediments.

Fossil ephedran pollen has been reported from rocks of Permian to Recent age in many parts of the world. It has been reported from Permian deposits in Russia (Samoilovich, 1953), Australia (Balme and Hennelly, 1956), Oklahoma (Wilson, 1962), and Kansas (Shaffer, 1964). North American Triassic deposits containing ephedran pollen occur in Arizona (Scott, 1960) and in Canada (Jansonius, 1962).

Ephedran pollen grains were reported by Hedlund (1963) from the Woodbine Formation (Upper Cretaceous) of Bryan County, Oklahoma. Potter (1963), working with the Omadi coal (Lower Cretaceous) of the Oklahoma Panhandle, did not report the presence of ephedran pollen grains. The ephedran pollen grains reported here from Pleistocene sediments were found in association with Cretaceous-Tertiary hystrichosphaerids (Bond, 1965). Therefore it is possible that the pollen grains are undescribed Cretaceous forms.

The genus *Ephedra* has approximately 42 living species distributed widely in arid tropic and temperate regions (Wilson, 1959). Eighteen species of *Ephedra* occur in the Canary Islands, the Mediterranean region, India, China, Persia, and Siberia. Fifteen species are distributed in North America and are most abundant in California, Arizona, New Mexico, and Mexico. Seven species grow as far east as eastern Texas, with one species in southwestern Oklahoma. In South America are eleven species, distributed from Bolivia to Patagonia.

Ephedra antisyphilitica, the one species native to Oklahoma, is restricted to the southwest corner of the State, part of which is in the Red River drainage basin. Three other species, *Ephedra torreyana, E. trifurca,* and *E. aspera,* occur in Texas and New Mexico. The pollen grains found in Pleistocene terrace deposits of the Washita and Red Rivers do not resemble grains of *E. antisyphilitica* as described by Steeves and Barghoorn (1959), nor the specimens of that species illustrated here (pl. I, figs. 5-12). Also they do not resemble the Texas and New Mexico species.

The Washita and Red Rivers traverse Permian and Triassic rocks,

* One project supported by National Science Foundation Grant G19593.

and the ephedran fossils reported here may be recycled because they are unlike those of the native extant species of the area, or grains described by Wilson (1962) from the Flowerpot Formation. Since these may be recycled forms and the source rocks are not known, no new specific names are assigned.

POLLEN DESCRIPTIONS

Class GYMNOSPERMAE
Order GNETALES
Family EPHEDRACEAE

Genus *Ephedra* Tournefort ex Linnaeus, 1737

Ephedra antisyphilitica Berland

Plate I, figures 5-12

Pollen grains bilateral, fusiform, polycolpate; polar axis 42 to 59 microns; equatorial diameter 33 to 49 microns; ridges number 12 to 18, 2.5 microns in height and 2.5 to 5 microns in width at the equator, colpi indistinct between ridges; wall smooth, thickness averages 1 micron.

The pollen grains of *Ephedra antisyphilitica* were recovered from strobili of a single herbarium specimen (G. J. Goodman, Bebb Herbarium 2053, University of Oklahoma). The number of ridges on the pollen grains shows all gradations from a few ridges (pl. I, fig. 5) up to 14 ridges (pl. I, fig. 12). The colpi are equally gradational, ranging from straight (pl. I, fig. 5) to irregular and wavy between ridges (pl. I, figs. 6-9).

Variation of structure may be related to stages of maturation or position of the pollen grains in the microsporange. Therefore the designation of specific epithets for fossils of the genus upon the basis of number of ridges or of number, shape, and visibility of the colpi should be undertaken cautiously.

Ephedra antisyphilitica, placed in Type B by Steeves and Barghoorn (1959), has the largest pollen grains in this group. It is further characterized by the presence of an extremely tenuous exoexine, which easily becomes disassociated from the endoexine. The exoexine may become free at one pole, both poles, or irregularly around the grain (Steeves and Barghoorn, 1959).

Anteturma POLLENITES R. Potonié, 1931
Turma POLYPLICATES Erdtman, 1952

Genus *Ephedripites* Bolchovitina, 1953

Type species.—*Ephedripites mediolobatus* Bolchovitina, 1953, p. 60, pl. 9, fig. 15; pl. 11, fig. 120.

Ephedripites sp.

Plate I, figures 1-4

Pollen grains bilateral, fusiform, polycolpate?; colpi absent or not visible; numerous ridges with sinuous unbranched furrows commonly visible in one surface view; ridges rounded at termini and not forming distinct polar thickenings, 2 to 3 microns wide, smooth to minutely granular under oil immersion; length 55 to 65 microns, equatorial diameter 30 to 50 microns.

These grains are similar to the Type D grain of Steeves and Barghoorn (1959) and resemble *Ephedra trifurca* which occurs in New Mexico, but differs in wall thickness, number of ridges, and overall size. *E. trifurca* has a polar axis measuring 39 to 63 microns and an equatorial diameter of 28 to 30 microns. The Type D grain is characterized by low, wide, gently rounded ektexinous ridges 2 to 3 microns in height and 3.5 to 9 microns in width. Within this group occur species which possess the greatest number of ridges. The furrows flanking the ridges are narrow, unbranched, and straight. No colpi are visible.

Explanation of Plate I

Ephedripites **sp.**

Figure 1. OPC 1004 H-3-3. Length 62.5 microns, equatorial diameter 37.5 microns; 7 ridges; furrows at base of ridges indistinct.

Figure 2. OPC 1004 E-4-2. Length 60 microns, equatorial diameter 35 microns. Poorly preserved form; ridge number or furrow type not determinable.

Figure 3. OPC 1062 T-3-3. Length 57.5 microns, equatorial diameter 32.5 microns; exine almost completely smooth; poorly developed small ridges; no colpi visible.

Figure 4. OPC 1004 C-1-1. Length 57.5 microns, equatorial diameter 35 microns; one large sulcus? from pole to pole.

Ephedra antisyphilitica

Figure 5. Bebb Herbarium 2053 (SP 1322-1-1). Length 51 microns, equatorial diameter 33 microns; 6 ridges; simple, straight furrows 17 microns in length.

Figure 6. Bebb Herbarium 2053 (SP 1322-1-2). Length 54 microns, equatorial diameter 35 microns; 7 ridges; short, wavy furrows 19 microns in length.

Figure 7. Bebb Herbarium 2053 (SP 1322-1-3). Length 60 microns, equatorial diameter 37 microns; 7 ridges; wavy furrows 25 microns in length.

Figure 8. Bebb Herbarium 2053 (SP 1322-1-4). Length 54.5 microns, equatorial diameter 36 microns; 9 ridges; wavy furrows 27 microns in length.

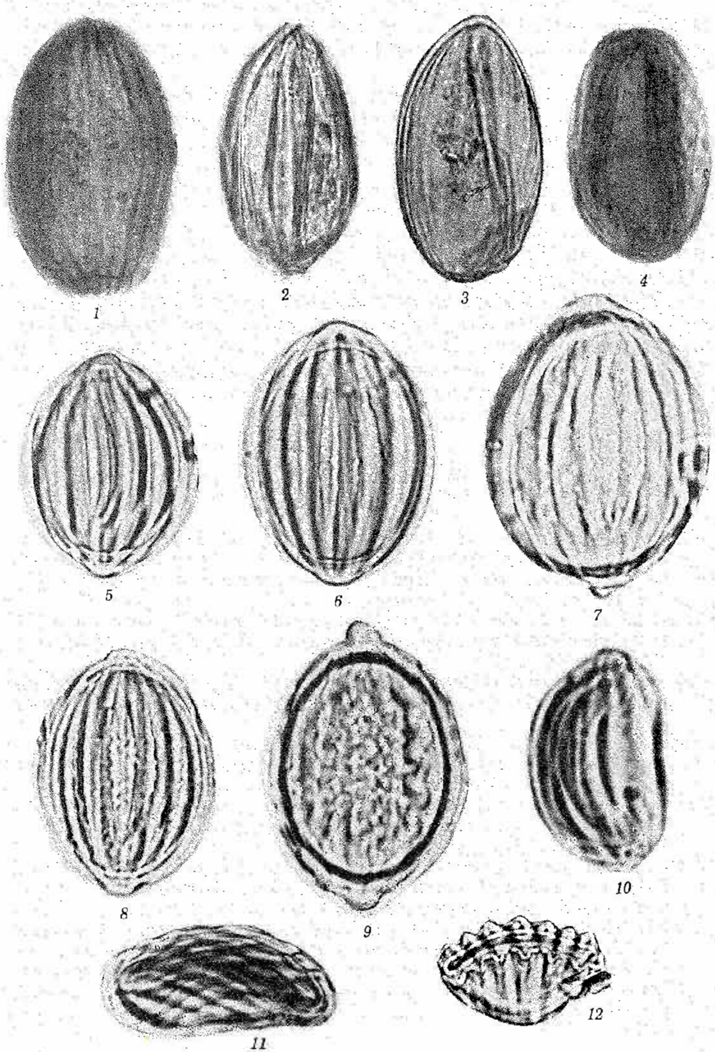
Figure 9. Bebb Herbarium 2053 (SP 1322-1-5). Length 59 microns equatorial diameter 35 microns; 7 ridges; highly contorted branching furrows 50 microns in length.

Figure 10. Bebb Herbarium 2053 (SP 1322-1-6). Length 50 microns, equatorial diameter 15 microns, compressed and highly folded; furrow type and ridge number indistinct.

Figure 11. Bebb Herbarium 2053 (SP 1322-1-7). Twisted, compressed form encountered in some fossil forms; ridge number or furrow type indistinct.

Figure 12. Bebb Herbarium 2053 (SP 1322-1-8). Pollen grain showing ridges in profile.

Plate I



Recycling in palynological assemblages has been discussed in detail by Wilson (1964). Within the last few years recycling of palynological fossils has become recognized as important. Cushing (1964) has reported recycled Cretaceous pollen and hystrichosphaerids in Pleistocene sediments in east-central Minnesota, and Bond (1965) found recycled hystrichosphaerids in Pleistocene sediments in Oklahoma.

The present study further demonstrates the need for palynologists to be aware of the possibilities of recycling in materials with which they are working. The occurrence of ephedran pollen grains in Pleistocene sediments of southwestern Oklahoma generally would not be considered out of place because a species of *Ephedra* is native to the area of study. However, the grains found in the terrace deposits show little similarity to those taken from herbarium specimens collected in the area. Also the terrace-deposit specimens are dark brown and are stain-resistant, two characters of many fossil pollen grains.

The fossil pollen grains from the terrace deposits do not resemble those of the Oklahoma *Ephedra* species, nor do they resemble *E. torreyana* or *E. aspera* of Texas and New Mexico; consequently they are considered to be recycled from Permian, Triassic, or Cretaceous rocks which crop out within the area drained by the two rivers.

References Cited

Balme, B. E., and **Hennelly, J. P. F.**, 1956, Monolete, monocolpate, and alete sporomorphs from Australian Permian sediments: Australian Jour. Botany, vol. 4, p. 54-67.

Bolkhovitina, N. A., 1953, Sporov-pyl'tsevaya kharakteristika melovykh otlozheniy tsentral'nykh oblastey SSSR: Akad. Nauk SSSR, Instituta Geologicheskikh Nauk, Trudy, vol. 145, Geologicheskai Seriya (no. 61), 184 p., 16 pls., 10 text-figs.

Bond, T. A., 1965, Recycled hystrichosphaerids in Pleistocene sediments in central Oklahoma: Okla. Geol. Survey, Okla. Geology Notes, vol. 25, p. 126-130, 1 pl.

Cushing, E. J., 1964, Redeposited pollen in late-Wisconsin pollen spectra from east-central Minnesota: Amer. Jour. Science, vol. 262, p. 1075-1088, 1 fig.

Hedlund, R. W., 1963, Palynology of the Red Branch Member of the Woodbine Formation (Upper Cretaceous) in Bryan County, Oklahoma: Okla., Univ., unpublished doctoral dissertation, 147 p.

Jansonius, Jan, 1962, Palynology of Permian and Triassic sediments, Peace River area, western Canada: Palaeontographica, Abt. B, vol. 110, no. 1-4, p. 35-98, 3 figs., 16 pls.

Potter, D. E., 1963, Spores and pollen in a Cretaceous coal in the Omadi Formation, Dakota Group of Cimarron County, Oklahoma: N. Y. Univ., unpublished Master of Science thesis, 80 p.

Samoilovich, S. R., 1953, Pollen and spores from the Permian deposits of the Cherdyn' and Aktyubinsk areas, Cis-Urals, translated by Elias, M. K., 1961: Okla. Geol. Survey, Circ. 56, 103 p., 17 pls. (from Paleobotanicheskii Sbornik: Leningrad, Vsesoiuznyi Nauchno-issledovatel'skii Geologo-razvedochnyi Institut, Trudy, new ser., no. 75, p. 5-57, pls. 1-17).

Scott, R. A., 1960, Pollen of **Ephedra** from the Chinle Formation (Upper Triassic) and the genus **Equisetosporites:** Micropaleontology, vol. 6, p. 271-276, 1 pl., 2 text-figs.

Shaffer, B. L., 1964, Stratigraphic and paleoecologic significance of plant microfossils in Permian evaporites of Kansas, **in** Palynology in oil exploration, a symposium: Soc. Econ. Paleontologists Mineralogists, Spec. Pub. 11, p. 97-115, 4 pls., 3 figs.

Steeves, M. W., and **Barghoorn, E. S.**, 1959, The pollen of **Ephedra:** Harvard Univ., Arnold Arboretum, Jour., vol. 40, p. 221-225.

Wilson, L. R., 1959, Geological history of the Gnetales: Okla. Geol. Survey, Okla. Geology Notes, vol. 19, p. 35-40, 1 pl.

__________1962, Permain plant microfossils from the Flowerpot Formation, Greer County, Oklahoma: Okla. Geol. Survey, Circ. 49, 50 p., 3 pls., 2 figs., 1 table.

__________1964, Recycling, stratigraphic leakage, and faulty techniques in palynology: Grana Palynologica, vol. 5, p. 425-436.

Dates of Some Recent Publications Concerning Goniatites

Owing to the requirements of the Code of Zoological Nomenclature insofar as it pertains to laws of priority with respect to names, it appears necessary to provide the exact dates of publications of the following papers which deal with related taxa. In each case data were provided, on request, by the publisher or agent responsible for the publication.

McCaleb, J. A., Quinn, J. H., and Furnish, W. M., 1964, The ammonoid family Girtyoceratidae in the southern Midcontinent: Okla. Geol. Survey, Circ. 67. Published July 15, 1964.

Furnish, W. M., Quinn, J. H., and **McCaleb, J. A.,** 1964, The Upper Mississippian ammonoid **Delepinoceras** in North America: Palaeontology, vol. 7, pt. 2. Published July 21, 1964.

Gordon, Mackenzie, Jr., 1964, California Carboniferous cephalopods, **in** Contributions to paleontology: U. S. Geol. Survey, Prof. Paper 483A. Published July 31, 1964 (information supplied by the then acting director of the U. S. Geological Survey).

Gordon, Mackenzie, Jr., 1965, Carboniferous cephalopods of Arkansas: U. S. Geol. Survey, Prof. Paper 460. Published February 12, 1965 (title page gives year of publication as 1964).

—J. H. Q.

Index*

Volume 25, 1965

*Reference is to first page of article containing indexed item.

Publication Dates, **Oklahoma Geology Notes,** Volume 25

The twelve numbers of this volume of the Notes were issued on the following dates during 1965:

NUMBER	PAGES	MONTH	DATE	NUMBER	PAGES	MONTH	DATE
1	1- 28	January	1	7	173-204	July	9
2	29- 52	February	2	8	205-244	August	4
3	53- 88	March	1	9	245-260	September	1
4	89-116	April	5	10	261-276	October	1
5	117-148	May	7	11	277-296	November	3
6	149-172	June	2	12	297-316	December	1

OKLAHOMA GEOLOGY NOTES

Volume 25 December 1965 Number 12

IN THIS ISSUE