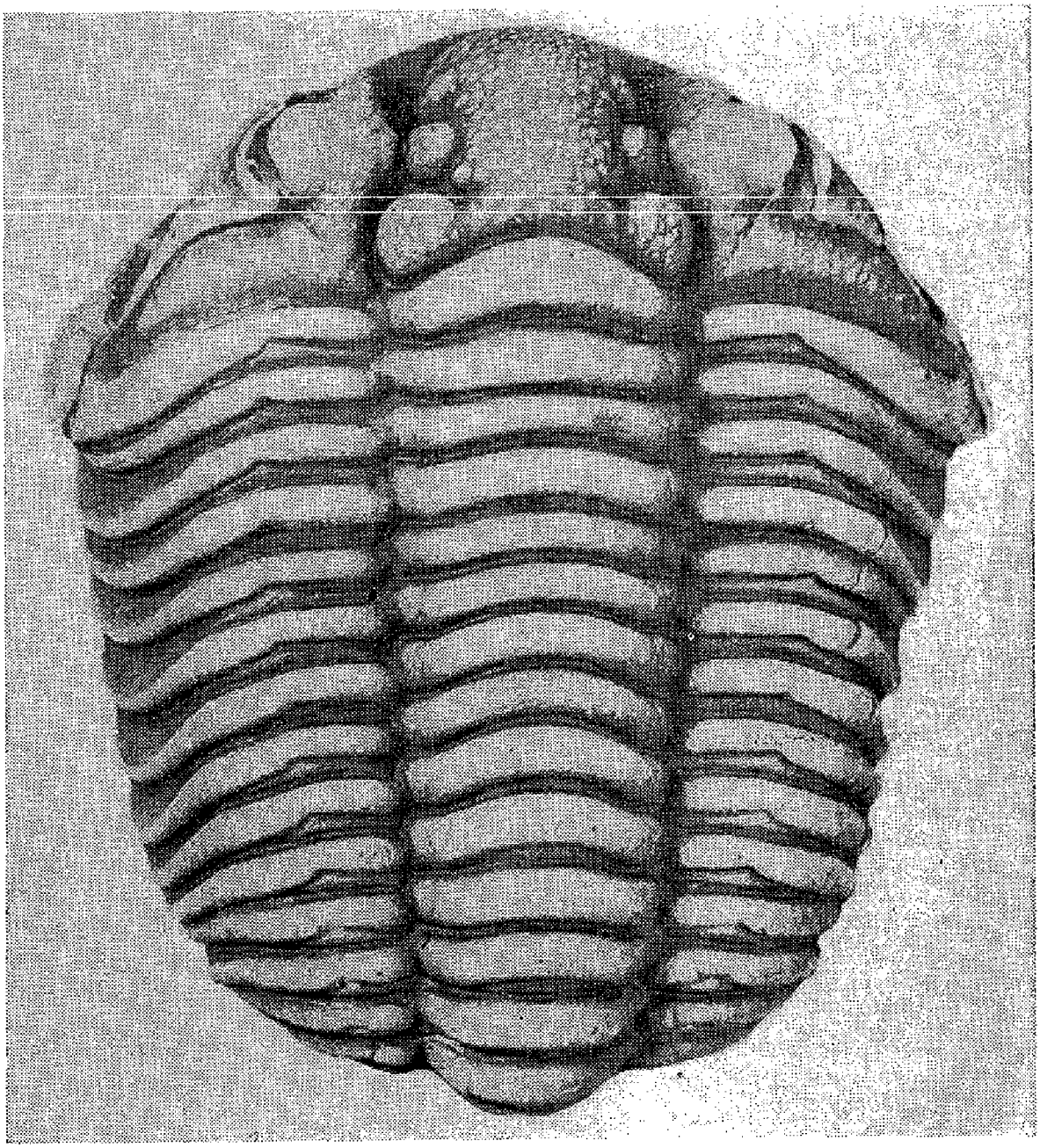
# OKLAHOMA GEOLOGY NOTES




## OKLAHOMA GEOLOGICAL SURVEY

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# Palynological Meeting in Oklahoma

On January 17 Dr. Gunnar Erdtmann, Director of the Palynologiska Laboratoriet at the University of Stockholm, spoke in the auditorium of the Petroleum Science Building at Tulsa University. The meeting was sponsored by Jersey Production Research Co., Pan American Oil Co. and the Department of Geology of Tulsa University. Dr. Erdtmann is a specialist on morphology and taxonomy of modern spores and pollen. He explained the nature of palynological ecological work as related to glacial retreat and outlined the application of such studies in a variety of fields. He described and showed slides prepared by photomicrography with compound, interference, phase, fluorescent, and electron microscopes. Case histories of application of these techniques in taxonomic and other problems were presented. Dr. Erdtmann outlined the new ecological terminology for glaciated regions and defined the terms protocratic, mesocratic, teleocratic, and cryocratic.

During the question period Dr. Erdtmann outlined the proposed artificial system of classification of pollen and spores.

The lecture was attended by about 150 geologists of whom 16 are palynologists and five are students of the subject. Palynologists and students present were:

A. C. Cridland—University of Kansas, Lawrence
Aureal T. Cross—Pan American Research Laboratories, Tulsa
Philip Davis—student, University of Oklahoma, Norman
William Evitt—Jersey Production Research Laboratory, Tulsa
J. W. Funkhouser—Jersey Production Research Laboratory, Tulsa
Patsy Garner—student, University of Oklahoma, Norman
John Grayson—Magnolia Research Laboratory, Dallas
Richard Hedlund—student, University of Oklahoma, Norman
W. S. Hoffmeister—Jersey Production Research Laboratory, Tulsa
A. L. Hornbaker—Kansas State Geological Survey, Lawrence
Eugene Jones—student, University of Oklahoma, Norman
Robert M. Kosanke—Illinois Geological Survey, Urbana, Illinois
Harry A. Leffingwell—Jersey Production Research Laboratory, Tulsa
Stella Leopold—U. S. Geological Survey, Denver
D. E. Potter—Sinclair Oil and Refining Co., Tulsa
Lili Ronai—Jersey Production Research Co., Tulsa
Lewis Stover—Jersey Production Research Laboratory, Tulsa
E. A. Stanley—Pennsylvania State University, University Park, Pa.
Robert Tschudy—Palynological Research Laboratory, Jamestown, Colo.
Dwight Waddell—student, University of Oklahoma, Norman
L. R. Wilson—University of Oklahoma, Norman

The lecture meeting was remarkable in that about one-fourth of all of the geological palynologists in the United States were in attendance.

C. C. B.

# Enid Rock Hound Society

A new society was organized in 1958 and already has about 35 members. The first president is Mrs. Ada Immel, 1716 West Main, Enid. The club becomes the fifty-eighth to affiliate with the Rocky Mountain Federation.

# Location of Some Oklahoma Type Specimens

The Department of Geology of Washington University (St. Louis) has deposited its type fossil specimens in the U. S. National Museum. Four of these are Oklahoma specimens, as follows:

The holotype of *Holaster simplex* Shumard, 1853, p. 198-199, pl. 3, fig. 2. USNM No. 129186.

The holotype of *Hemiaster elegans* Shumard, 1853, p. 198, pl. 2, figs. 4 a-c. USNM No. 129187.

Probably the specimen of *Ammonites vespertinus* Morton discussed by Shumard, 1853, p. 196. USNM No. 129190.

Possibly the specimen identified as *Pecten quadricostatus* Sowerby by Shumard and discussed but not figured. USNM No. 129188.

All of these specimens were labeled "Fort Washita", which is a former military station in northwestern Bryan County. Fort Washita was established in 1842 and was abandoned in 1861. The ruins are on the east side of Lake Texoma near Nida. The specimens probably were collected from the Ft. Worth limestone of the Washita series (Upper Cretaceous). *Hemiaster elegans* is now referred to the genus *Macraster*. The form identified as *Ammonites vespertinus* is probably *Oxytropidoceras belknapi* (Marcou), a species described from the Kiamichi of nearby Texas. The specimen called *Pecten quadricostatus* may be *Pecten* (*Neithea*) *wrighti* Shumard.

The article is by Ellen James Trumbull, Journal of Paleontology, vol. 32, pages 893-906, November, 1958. C. C. B.

# Occurrence of *Cordaites michiganensis* in Oklahoma

E. J. TYNAN

A specimen of fossil wood discovered in Oklahoma has been identified as *Cordaites michiganensis* Arnold, 1931. The fossil stump was collected by Drs. C. C. Branson and L. R. Wilson in the southeast corner of section 12, T. 15 N., R. 11 E., Okmulgee County, three miles north and two miles west of the town of Beggs, Oklahoma. Thin sections of the fossil prepared for this study are in the Oklahoma Geological Survey fossil plant collection.

The specimen was collected from the upper part of the Dawson coal. The Dawson coal at this locality is nine to ten inches thick. It is underlain by one to two feet of underclay, and overlain by a buff siltstone. The Dawson coal is contained in the Seminole formation, which in northeast Oklahoma is a shale and sandstone unit lying above the unconformity at the base of the Missourian series and below the base of the Checkerboard limestone. In Tulsa County, a few miles north of the above locality, the Seminole formation is composed of a lower brown sandy zone, a middle shaly zone containing the Dawson coal, and an upper sandy zone. Coal occurs in all three members, but the Dawson seam in the middle shaly zone is the only one of economic importance (Oakes, 1952, p. 48-49).

The only published occurrence of *Cordaites michiganensis* is the original description by Arnold (1931). This description was made from a specimen collected by a party from the Museum of Paleontology of the University of Michigan at a quarry along the south bank of the Grand

River, about one mile west of Grand Ledge, Michigan. The horizon from which the specimen described was taken appears doubtful, being recorded as lower Pennsylvanian, probably Saginaw. The Saginaw formation of Michigan is roughly equivalent to the entire Atokan series of Oklahoma.

Comparison of Michigan and Oklahoma specimens of *C. michiganensis.*

| *Michigan specimen* | | *Oklahoma specimen* |
|---|---|---|
| | *Transverse section* | |
| | Diameter of tracheid | |
| 35$\mu$ | | 35-45$\mu$ |
| | Shape of tracheid | |
| Square to slightly oblong, regular in size and shape | | Square to rectangular, variable in size and shape |
| | Growth rings | |
| Lacking | | Lacking |
| | *Tangential section* | |
| | Wood rays | |
| Uniseriate, occasionally biseriate near middle of ray | | Uniseriate, occasionally biseriate near middle of ray |
| | Dimensions | |
| Equal in height and width | | Average of 25$\mu$ in diameter, slightly higher than wide |
| | Number of cells high | |
| 2-10 | | 1-33, 70% less than 10 |
| | *Radial section* | |
| | Pit arrangement | |
| Alternating | | Alternating |
| | Shape | |
| Hexagonal | | Hexagonal |
| | Rows of bordered pits | |
| Chiefly 2 (3-4) | | 2-4, chiefly 2 |
| | Dimension of bordered pits | |
| Not reported | | 12.8$\mu$ |
| | *Lumen* | |
| Not reported | | Slit, nearly equal to the diameter of pit |
| | Length of ray cells | |
| Single cell crosses 1-4 tracheids | | Single cell crosses 1-3 tracheids |

PLATE I

FIG. 1. Transverse section of Oklahoma specimen of *Cordaites michiganensis* Arnold showing the tracheids and wood rays. The cells of the latter are narrower than those of the tracheids.

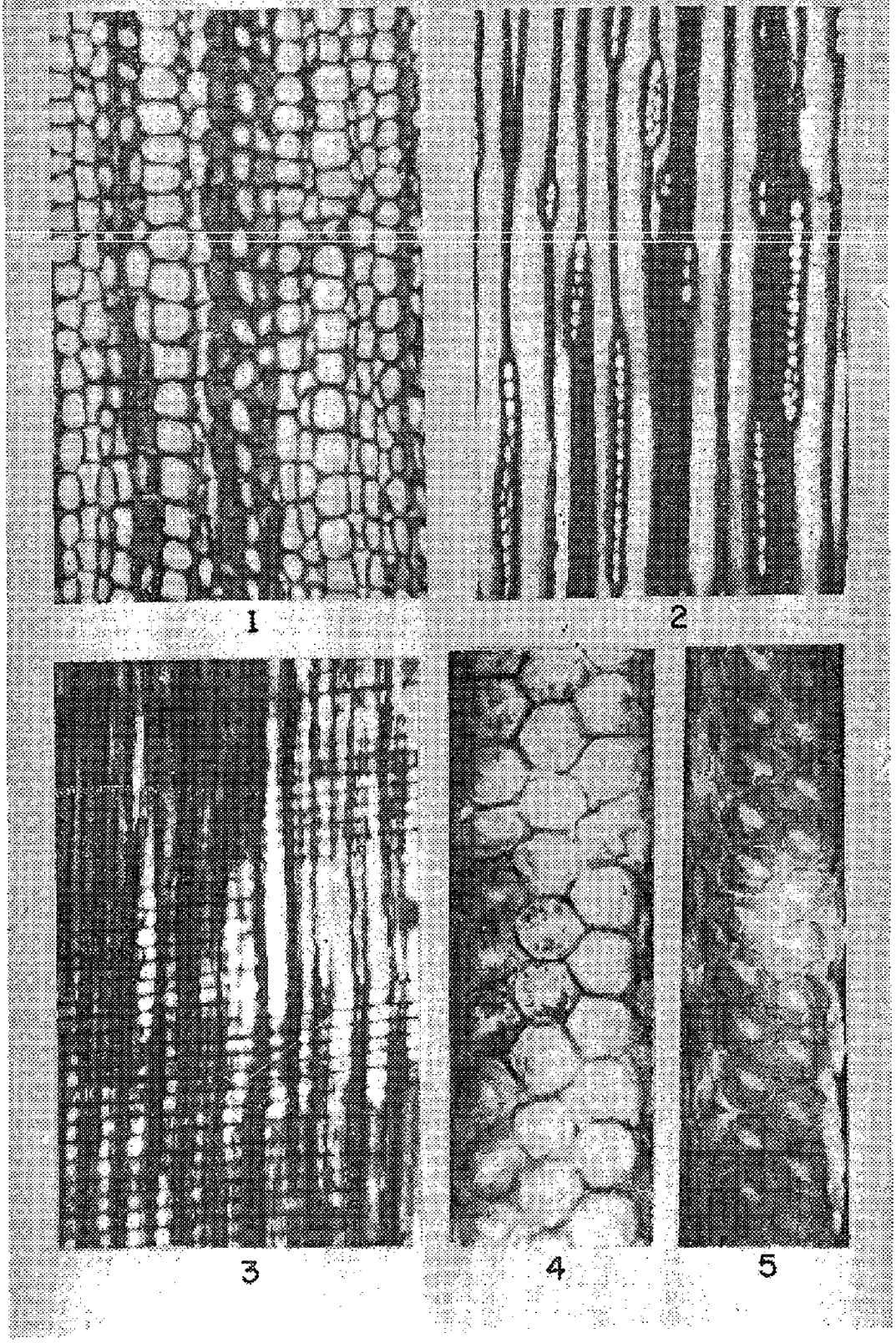
FIG. 2. Tangential section of the same specimen showing tracheids in longitudinal view and the wood rays in transverse view. The latter range from 1-33 cells high with 70% less than 10.

FIG. 3. Radial section of the same specimen showing both tracheids and wood rays in longitudinal view. The tracheids possess araucarioid type bordered pits which cover the entire radial wall. Enlargements of these are shown in the figures below.

FIG. 4. Enlargement of a single tracheid showing bordered pits and lumen.

FIG. 5. Enlargement of a single tracheid showing alternate arrangement and hexagonal shape of araucarioid type bordered pits.

Plate I



1 2 3 4 5

The excellent preservation of both the type material and the Oklahoma specimen permitted a close comparison. At least until primary tissues are found, the Oklahoma specimen is identified as *Cordaites michiganensis* Arnold, 1931.

The Oklahoma specimen of *Cordaites michiganensis* extends the geographic and geologic range of the species. The Michigan rocks are classed as Atokan and can be no younger then Early Desmoinesian, whereas the Oklahoma specimen is from Early Missourian strata.

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# Genotype of *Densosporites* Berry, 1937

L. R. Wilson

The genus *Densosporites* containing three species was described by Willard Berry in 1937 from the Pennington coal (Mississippian) of Tennessee. In 1944, Schopf, Wilson, and Bentall emended Berry's description of the genus and transferred to it three of Loose's (1934) species. Numerous additional species have since been assigned to this genus. In 1954 Potonié and Kremp also emended *Densosporites*. The holotype was not seen by the emenders either in 1944 or in 1954 which probably accounts for the different interpretations. After the publication of Schopf, Wilson, and Bentall the writer borrowed the microslide containing the holotype from Dr. Berry and photographed the specimen (Pl. I, fig. 2). Unfortunately, when the slide was returned, it was damaged and subsequently it was discarded.

The genotype was designated by Berry (1937) as *D. covensis* (Pl. I, fig. 1) on Slide $L_1$ (85.4 x 47.1). The description given for the genus is as follows: "Characterized by a thick opaque wall, thickness about one-third the diameter of the spore; central portion clear, no triradiate split," and for the species *D. covensis:* "Spore oval; wall very thick, about one-third of diameter, very dark and opaque, very smooth and even; central portion more or less clear and roughly trapezoidal in shape, margins very clearly marked, no apparent connection between inside and outside. Length about 58$\mu$; width 50$\mu$." Discussing the fossil species Berry states, "This grain is fairly abundant but less than *D. densus*, from which it differs in being more oval and with much smoother surface. These two species are quite like those figured by Raistrick and Simpson (1933) as $A_1$ from the Plessey, Tilley, and Beaumont coals of Northumberland, England. I would refer those forms to this genus." (Pl I, fig. 5).

When the specimen designated as the holotype was studied, close agreement was found with the description by Berry except the dimensions were 50 x 56.1$\mu$ rather than 50 x 58$\mu$, and the shape was more angular than indicated by the rough diagrammatic sketch used to illustrate *D. covensis*. Much carbonaceous debris was present on the slide and one particle lay over a portion of the spore in such a manner that on first examination it might be interpreted as one ray of a trilete germinal structure. The spore was carefully studied but no germinal structure was found. The fossils were mounted in glycerine jelly and there was evidence of dehydration of the medium. This may have caused the specimen to have rotated slightly and thus account for the observed differences in size and shape.

In the emendation of *Densosporites* by Schopf, Wilson, and Bentall a weak trilete was noted as being apparent in well-preserved specimens (Pl. I, fig. 3), also that "fissures" penetrating to the margin occasionally do occur. The latter may be essentially haptotypic continuations of the trilete sutures. In some coal preparations this feature has been observed related to the over-maceration of the spores. Potonié and Kremp (1954) state in their emendation of the genus that trilete sutures are weak to strongly developed, and they have illustrated the genus with a drawing which shows the trilete ridges extending across the cingulum (Taf. 13, Fig. 57, also this article Pl. I, fig. 4). In Berry's original description such latitude of form

was not indicated and the photomicrograph of the holotype clearly shows what element of this spore complex was chosen by Berry to be *Densosporites*. The genus in its present state of description varies widely in its morphological range. At one end of the series the species are like the genotype with an opaque equatorial thickening, and at the other end of the series the equatorial development (cingulum) is composed of translucent scale-like projections extending outward from the thicker and opaque part of the cingulum. The width of the denser portion ranges from approximately 75 to 10 percent of the cingulum. Some of these forms have well marked trilete sutures and extreme examples resemble some of the fossil spores which might be assigned to *Cirratriradites*. Intermediate forms which would be included in Potonié and Kremp's definition of the genus have been separated out of the complex by Hacquebard and Barss (1957) as species of *Cincturasporites* and *Labiadensites*.

*Densosporites* as a genus is in need of critical study and monographing. It is an important genus in Paleozoic stratigraphy for it contains a large number of species which have very restricted ranges. The species in the Pennington coal should be re-examined and a neotype should be chosen to replace the discarded holotype.

The affinity of *Densosporites* has been a mystery for many years. Recently, Chaloner (1958) has described a lycopod cone containing both megaspores and microspores. The former are similar to *Triletes hirsutus* and the latter are identified as *Densosporites* sp., cf. *D. loricatus*. With this important discovery at least one affinity of *Densosporites* becomes known.

## Plate I

Fig. 1. Photograph of Berry's original illustration of *Densosporites covensis* (Fig. 11, 1937). "a", represents the "clear" portion of the spore and "b", the "thick opaque wall".

Fig. 2. Photomicrograph of the holotype, *D. covensis*, from Slide L1 (85.4 x 47.1), The central portion is shown with debris lying across it. No trilete suture was present in the specimen.

Figs. 3, 3a 3b, and 3c. Illustrations from Schopf, Wilson, and Bentall (Pl. I, figs. 9-9c, 1944) showing their interpretation of *Densosporites*. Fig. 3, segment cut away to show thickening of peripheral region of spore coat; 3a, axial (longitudinal) plan uncompressed; 3b, form such spores habitually assume under normal compression; 3c, equatorial (transverse) plan.

Fig. 4. Photograph of Potonié and Kremp's illustration of *Densosporites* (Taf. 13, Fig. 57, 1954). A markedly well-developed trilete structure is shown extending across the cingulum of the spore. Such an interpretation is not in accord with that of previous authors, nor with the holotype.

Figs. 5, 5a, and 5b. Photograps from Raistrick and Simpson (A1, Fig. 2, 1933), illustrating the spores referred to by Berry (1944) as belonging to the genus *Densosporites*.

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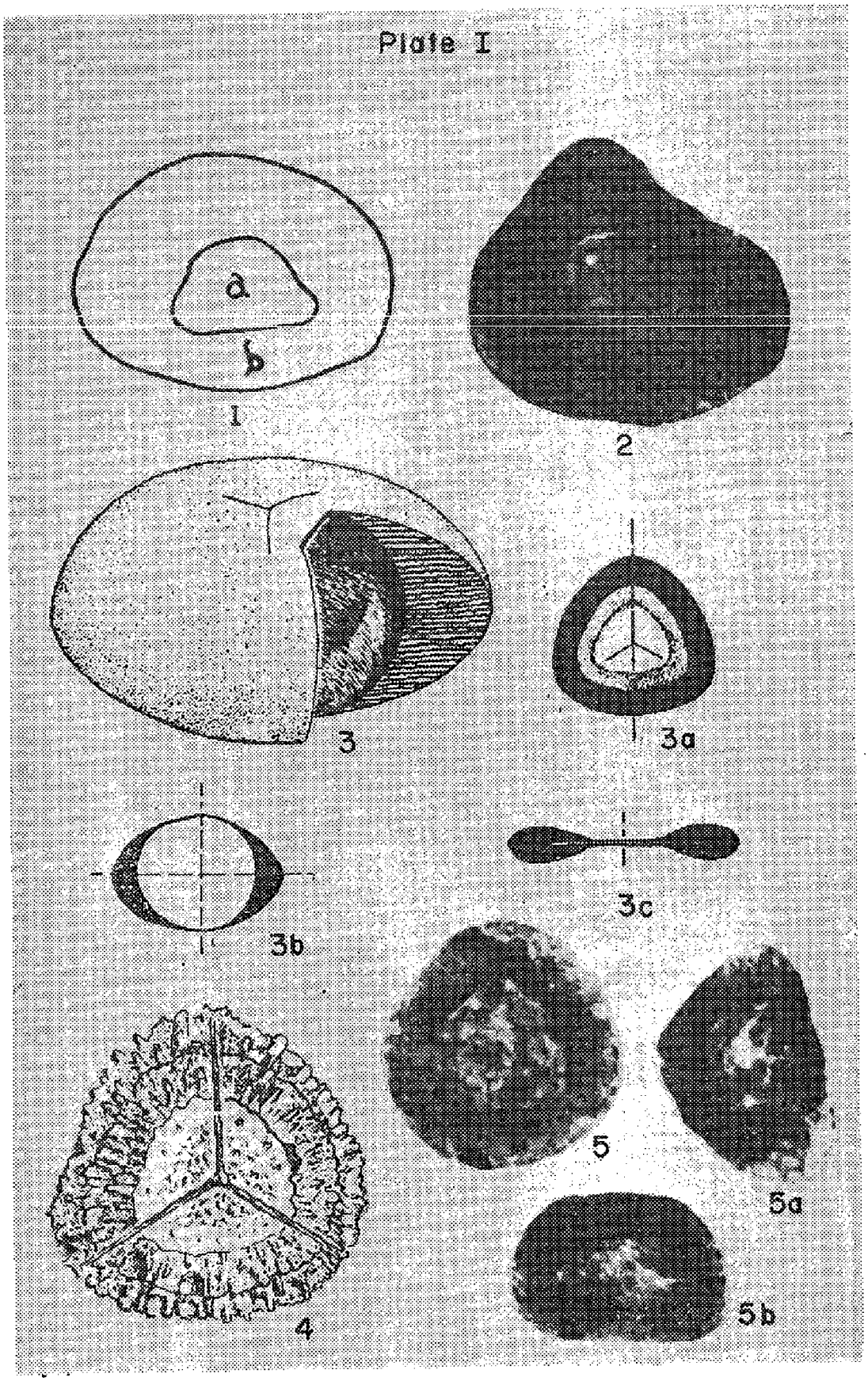
Plate I
a
b
1
2
3
3a
3b
3c
4
5
5a
5b

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# Another Russian Geologic Atlas

For more than 20 years Russia has been gathering scientific information on certain subjects in the form of "atlases", more nearly defined in English as encyclopedias. One recently received is Atlas of the Leading Forms of the Fossil Flora and Fauna of the Permian Beds of the Kuznetsk Basin. This basin, which lies in Siberia along the Tom and Ob River valleys, is a sedimentary basin consisting of a thick (10,000-20,000 feet) sequence mainly of fresh-water and brackish-water Permian rocks.

The first fossils described from these rocks were ostracodes and supposed ostracodes named by T. R. Jones in 1885. The present volume brings together earlier results and presents new species as follows:

Vermes (p. 31, by Khalfin) *Spirorbis* sp.

Lamellibranchiata (p. 32-57, by Khalfin) 17 genera, 37 species (2 new by Betekhtina).

Barnacles (p. 57, by Khalfin) *Cirravus yavorskyi* Tschernyschew. A supposed goose-neck barnacle.

Ostracodes (p. 58-109, by Mandelstam) 7 genera, 4 new, and 77 species, 67 new. Thirty-nine species of *Darwinula* (all but one new, seems excessive).

Plant compressions (p. 110-206, by Radchenko) 22 genera, 3 new, 54 species, 24 new of which 3 are from Gorelova's manuscript; and one new subspecies.

Spores and pollen (p. 207-271, by Andreeva) Five form genera, *Azonatriletes* with 60 species (37 new) and 14 varieties (all new); *Azonaletes*, with 12 species (7 new) and 3 varieties (one new); *Zonatriletes*, with 9 species (4 new) and one new variety; *Zonaletes*, with 20 species (12 new) and 4 new varieties; and *Coniferaletes*, with 22 species (21 new).

All of the illustrations of the spores, pollen and ostracodes are drawings. Without being able to read the text and with no data on stratigraphic ranges, one is inclined to reject most of the ostracode species. Many of the illustrated specimens are crushed and a large number are decorticated.

Stratigraphic information is by Yavorski. The section is:

Erunakova beds
Il'insk beds
Kuznetsk beds
Balakhonsk beds

The book is published by the V S E G E I, the All-union Scientific Research Geological Institute, 411 pages, 60 plates, charts in pocket, 1956.

C. C. B.

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Compiled by NEVILLE M. CURTIS, JR.


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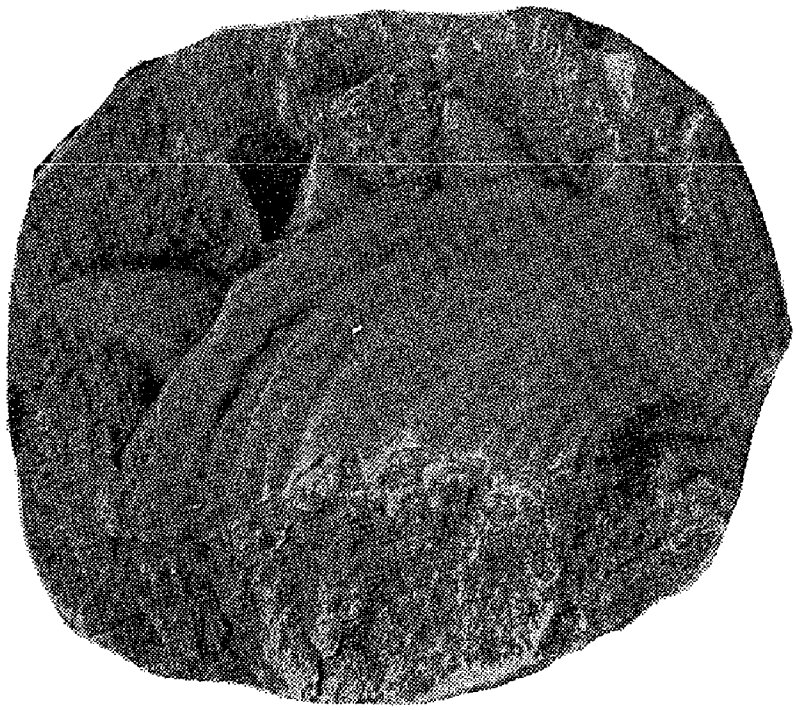
Prepared by NEVILLE M. CURTIS, JR.



**Photograph of the specimen from the Excello shale, X 6.**

# An Unusual Snail From the Excello Shale

CARL C. BRANSON

The Excello shale is the black fissile shale which lies above the Breezy Hill limestone and below the Blackjack Creek limestone (Lower Fort Scott). It is the highest unit of the Cabaniss group. The shale bears abundant phosphatic nodules, most from one-half inch to over an inch in diameter. Many of the concretions have a fossil organism at the center and in 1953 Herbert Ware and I in cracking open some of the concretions found a small problematic fossil. It was then thought to be an edestid, a symphysial element of a late Paleozoic shark. Upon recent re-examination the specimen proved to be a snail.

The specimen as preserved is the umbilical slope and the rim of the first whorl together with the external mold of the same area. It is 11.5 mm in greatest dimension. The shell surface is marked by six small revolving ribs near the umbilicus, by two central broad folds, by a narrow rib which divides and divides again to make three near the aperature, and the outer margin is a broad flange, somewhat scalloped. Above the flange (beneath

on the specimen) five tooth-like projections extend outward and forward. These are hollow and are progressively larger towards the aperture.

Spine-bearing gastropods as relatively rare in the Paleozoic. The Devonian genus *Tubina* has spines, as does the Silurian genus *Tremanotus*. *Conradella* (Ordovician) has fluted frills, *Luciella* has a scalloped flange, and *Trachydomia* has nodes. The Oklahoma specimen most closely resembles *Echinocirrus* Ryckholt, 1860, a genus based upon *Cirrus armatus* Koninck, 1843, from the Visean of Belgium. The shell of *Echinocirrus* bears spines or spine-like tubules on the shoulder of each of the last three whorls.

The Oklahoma specimen was prepared and photographed by Dr. Thomas W. Amsden. The specimen was collected in the SE¼ sec. 36, T 24 N., R. 16 E., Rogers County, Oklahoma. It is No. 297 in the paleontological collection.

# Two New Vertebrates From the Permian Fort Sill Locality (a review)

David B. Kitts

Discoveries of fossil vertebrates in the Permian redbeds of Oklahoma have been relatively rare. This rarity probably results from the lack of extensive badlands development and the small proportion of predominantly continental as opposed to marine deposits in the Permian outcrop area of Oklahoma. In contrast to the rarity of fossil vertebrates in the Permian redbeds, the Fort Sill deposits of early Permian age have yielded an abundant and diversified vertebrate fauna. The deposits consist of clays which have accumulated in solution cavities within the Arbuckle group of limestones in Comanche County. The known Fort Sill fauna was described by Gregory, Peabody and Price in 1956 (Yale Univ., Peabody Museum Natural History, Bull., vol. 10, p. 1-177). Since the publication of this paper there have been two additions to the described Fort Sill fauna.

In a recent issue of the Journal of Paleontology (vol. 32, no. 5, p. 981-991) Vaughn has described a new reptile, *Colobomycter pholeter*, from the Fort Sill locality. The type specimen is a partial skull. Vaughn states that the new genus is closely related to *Eothyris* and shows signs of relationship to the caseids. The specimen thus sheds light on the problem of the early evolution of the Pelycosauria.

Vaughn has described another new Fort Sill reptile in a paper which appeared in the Journal of the Washington Academy of Sciences (vol. 48, p. 44-47). Thus peculiar little pelycosaur, to which Vaughn has given the name *Basicranodon fortsillensis*, is one of the very few reptiles ever described in which teeth are present on the parasphenoid.

There is abundant material from the Fort Sill fissures on hand in museum and university collections throughout the country. The fissures now exposed contain bone-bearing clays which have by no means been exhausted of their fossil content, and there is reason to believe that new fissures will be exposed during continuing operations in the Dolese Brothers quarry at Richards Spur, Comanche County. In view of these facts we can expect further additions to the Fort Sill fauna in the future.