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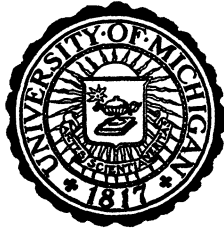
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A NEW *LACCOPTERIS* FROM THE
CRETACEOUS OF KANSAS

BY

ERNEST L. MINER



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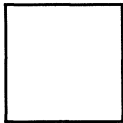
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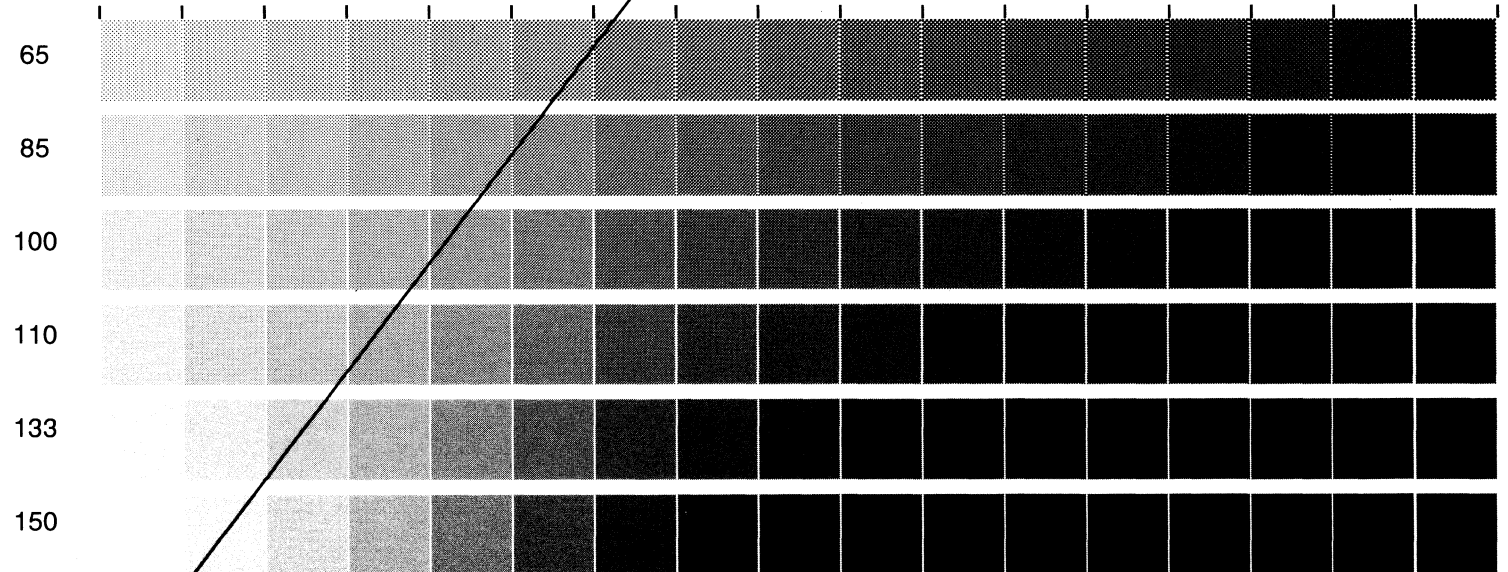
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(Continuation of Contributions from the Museum of Geology)

UNIVERSITY OF MICHIGAN

Editor: EUGENE S. McCARTNEY

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(Continued on inside of back cover)

A NEW *LACCOPTERIS* FROM THE CRETACEOUS OF KANSAS

By ERNEST L. MINER

THE fragment of the fertile fern pinnule described here was sent to Dr. Lewis B. Kellum by Mr. John E. Galley, who collected it near Mankato, Kansas, from a drill core that was reported to have come from the Dakota Sandstone. It was given to Dr. C. A. Arnold, who made a celloidin transfer and then turned the specimen over to the writer for examination.

In general appearance the specimen very closely resembles *Nathorstia*. The similarity is most striking in *N. alata*, figured by Halle (1913, Plate I, Figs. 4-7) from the Aptian of Patagonia. The differences between the two will be pointed out later.

Nathorstia latifolia, described by Nathorst (1908) from the Cenomanian of Greenland, has the sporangia of each sorus fused to form synangia containing 18-24 wedge-shaped loculi. The synangia are marked by concentric ridges or lines. Seward (1927), who recently examined the specimen, is inclined to think that these markings may be attributed to the annuli. This species is placed by him in the genus *Laccopteris*.

Nathorstia alata is characterized by circular sori which form synangia with 12-15 wedge-shaped loculi. Each synangium has a central receptacle from which radiate the straight lines that divide the synangium into the wedge-shaped sporangia or loculi. Halle (1913) states that these radiating lines cannot be anything but the common wall between adjacent sporangia. If these observations are correct this would prove that the sori consist of synangia and not free sporangia. Concentric lines such as mark the surface of the sori in *N. latifolia* are not visible in *N. alata*. The tops of the sori are not well preserved in the latter species so that nothing indicative of annuli was observed.

Seward (1927) upon a recent examination of Halle's material found faint indications of parallel ridges on some of the sori that are very suggestive of impressions of an annulus. He believes that the differences in the structure of the sori of *Nathorstia*, as described by Nathorst and by Halle, and a typical *Laccopteris* are probably the result of preservation and are not an indication of their position among the ferns. The present study seems to bear out this view, for if this specimen were described from an impression, the sori would in all probability be regarded as synangia and the fossil classed as a *Nathorstia*; but a celloidin transfer shows structures not otherwise visible, and the specimen is interpreted as belonging to the genus *Laccopteris*.

In this material from Kansas the sori are circular and are arranged in one row on each side of the midrib. They are not crowded or contiguous, as in *N. alata*, but are slightly separated from one another. They are made up of 11-16 wedge-shaped sporangia, and have the general appearance of the synangia described for *N. latifolia* and *N. alata*, except that the remains of an annulus can be seen on the outer margin of each sporangium (Fig. 4). The sporangia are so closely packed together that the lines which radiate from the center of the sori to the periphery appear to be the common wall between adjacent sporangia, but that is not entirely true, since the sporangia can be seen to be free from one another near the periphery of the sori. Where the tissue has been removed from the upper surface of the sori, there appears to be formed a central receptacle (Fig. 2), such as that described for *N. alata*. Spores are still present in many of the sporangia.

This specimen, although small, is distinct and characteristic enough to warrant specific designation. The name *Laccopteris Galleyi* is therefore proposed. The diagnosis is given below.

***Laccopteris Galleyi*, sp. nov.**

(Plate I, Figs. 1-4)

Fertile pinnule, 7.5 mm. wide; one row of sori on each side of rachis; sori separate, 1.3-1.7 mm. in diameter; 11-16 sporangia

per sorus, sporangia wedge-shaped, annulus incomplete; spores deltoid or subdeltoid, 25–33 μ in diameter, exine smooth, tri-radiate, numerous. Dakota Sandstone horizon, near Mankato, Kansas. The fragment of the pinnule is about 42 mm. long. There are two sori with 11 sporangia, six with 12, five with 13, six with 14, five with 15, and one with 16. The exact nature and the extent of the annulus, the number of sporangia in a few sori, and the venation of the pinnule could not be determined because of poor preservation.

The holotype of the species is number 15851 in the collection of the Museum of Paleontology, University of Michigan.

In venation *Nathorstia* and *Laccopteris* agree fairly well. The arrangement of the sori in one row on each side of the midrib is similar in both genera and, as pointed out by Seward (1927), it is difficult to believe that genera so nearly identical in habit, venation, and the form and arrangement of their sori could belong to ferns which are members of such widely separated families as the *Marattiaceae* and the *Matoniaceae*. It appears, then, as indicated before, that some of the supposed differences are merely the result of preservation.

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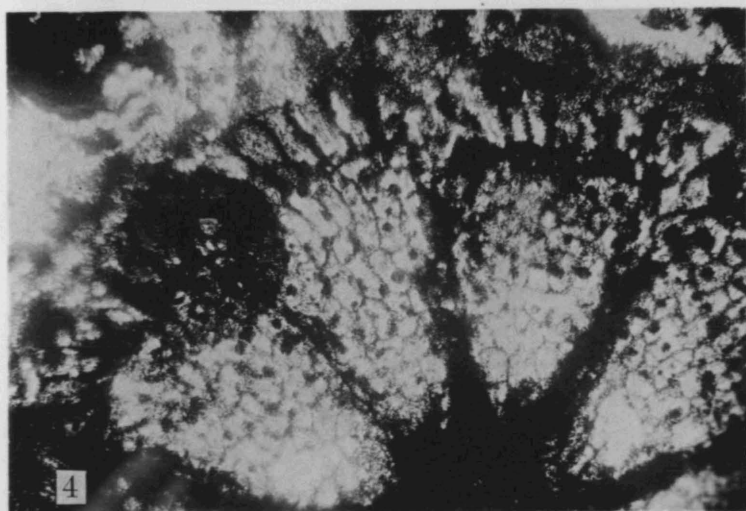
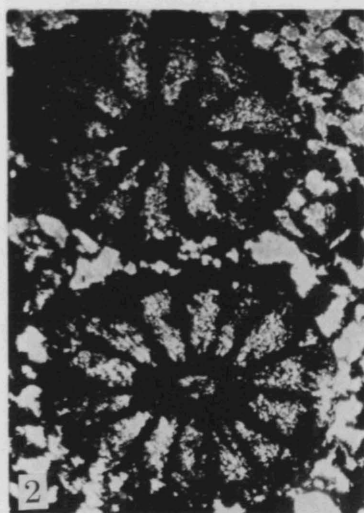
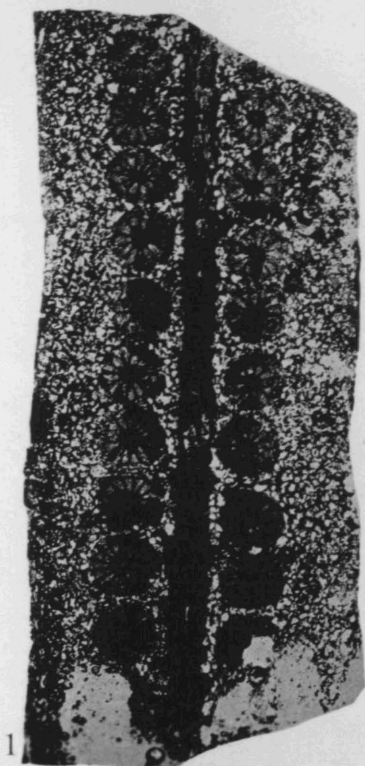
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EXPLANATION OF PLATE I

Laccopteris Galleyi, number 15851 U.M.

- FIG. 1. Portion of the pinnule showing the arrangement of the sori. $\times 5$
- FIG. 2. Two sori enlarged to show their general structure. In the lower one may be seen what appears to be a central receptacle. $\times 25$
- FIG. 3. A group of a few typical spores. $\times 400$
- FIG. 4. A part of a sorus enlarged to show a few sporangia with their annuli. $\times 75$

PLATE I



(Continued from inside of front cover)

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