

NOTES ON SOME AMERICAN SPECIES OF *LEPIDOSTROBUS*

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A perusal of paleobotanical literature soon reveals the fact that although carbonaceous impressions of the strobili of the Paleozoic Lycopodiales are common in the Carboniferous rocks of North America, our knowledge of the anatomy of these organs is based mostly upon European material. Aside from the *Lepidostrobus* material in the coal balls of Illinois, which awaits description, there are but three records of petrified material from North America. Of these three, considerable confusion has always existed regarding two of them.

The first record in America of petrified *Lepidostrobus* cones is an account by Coulter and Land (1911). Ten years later another account appeared describing additional material from the same locality (Coulter and Land, 1921). These specimens, which were secured from Warren County, Iowa, were described but not named. Because of the lack of a convenient means of designation this material has failed to receive the recognition it well deserves, and the fact that the specific name *Coulteri* was applied to it by Jongmans (1930) in his "Fossilium Catalogus" does not seem to be generally known. The discovery in these cones of spores of but one size led the investigators to assume that a homosporous form is represented, and if it is correctly interpreted, *L. Coulteri* is unique in this respect. Jongmans also remarks that this species bears a close resemblance to *L. Geinitzii* Schimper.

Lepidostrobus kentuckiensis, the name applied by Scott to a fragment of a petrified cone from the Waverley Shale of Kentucky, was originally described as *L. Fischeri* by Scott and Jeffrey (1914). The original name was found to be invalid, since Renault had previously applied it to another specimen. The correction of this error (Scott, 1915) seems to have escaped general notice. Hirmer (1927), in his "Handbuch der Paläobotanik," uses the first name (p. 230), and he also gives the horizon as "Obercarbon" whereas the Waverley Shale belongs to the Mississippian. The same nomenclatorial error was also followed by the present author when discussing this species in connection with *L. Bartletti* from Michigan.

An unpetrified but partially preserved lycopod strobilus from Pennsylvania was recently described by the present author and interpreted as possibly sigillarioid (Arnold, 1932, 1933). The horizon from which this specimen was derived is commonly referred to as the "Pocono" (therefore assumed to be Mississippian), but some recent investigations indicate quite conclusively that the so-called "Pocono" in this part of Pennsylvania belongs to the Upper

Devonian. Some investigators consider the formation at this place the equivalent of the Oswayo of New York, while others would place it lower at about the Cattaraugus level.

The Pennsylvania specimen was not named when it was described. Using the whorled arrangement of the sporophylls as a criterion, the specimen was assumed to exhibit sigillarian characters. More recently, however, attention has been directed to the fact that whorled sporophylls also occur in some forms of *Lepidostrobus* and that this condition is not in itself indicative of the Sigillariae. That some species of *Lepidostrobus* have whorled sporophylls is mentioned by Hirmer (1927, p. 191), but this statement was unfortunately overlooked when the description was given.

This specimen also bears considerable resemblance to *Lepidostrobus kentuckiensis* mentioned above. Computations based upon the preserved parts of *L. kentuckiensis* indicate that this cone was originally about 4 cm. in diameter. The length is unknown. The Pennsylvania specimen is slightly narrower, but there is a close agreement in the diameter of their axes and the length of the sporophylls and sporangia. The microspores of *L. kentuckiensis* measure about 48×60 micra, while those of the Pennsylvania specimen vary from 38 to 76 micra.

In general, then, there is some similarity between the Kentucky and the Pennsylvania specimens. The poor preservation renders detailed comparison impossible. In *L. kentuckiensis* much of the internal structure is known but the dimensions of the cone are only conjectured. For the Pennsylvania specimen the reverse situation exists.

Since our knowledge of the two forms under consideration is limited by the state of preservation, we are hardly in a position to designate them as conspecific in spite of certain marked similarities. At the same time the fact that the Pennsylvania specimen is from a horizon doubtlessly of Upper Devonian age renders it quite important that it be provided with a specific name for reference. Also it shows structure quite similar to that of the heterosporous lycopods of the Coal Measures and is of considerable phylogenetic interest. In naming this specimen it seems appropriate to associate with it the name of its collector, Mr. J. C. Galloway. The diagnosis is as follows:

***Lepidostrobus Gallowayi* sp. nov.**

Lycopodiaceous strobilus. Arnold, Amer. Jour. Bot. 20: 114-117. Fig. 1-7. 1933.

Cone large, $3\frac{1}{2} \times 10$ centimeters; sporophylls in whorls, those in adjacent whorls alternating, 10-15 millimeters long, borne at right angles to the axis; sporangia radially elongated; heterosporous; megaspores about 150 micra in diameter and with slender appendages; microspores 38 to 76 micra and either smooth or slightly rough; peduncle straight, about 13 millimeters in diameter.

Locality: Campbell Hollow, 1½ miles north-east of Port Allegany, McKean County, Pennsylvania.

Horizon: "Pocono" Sandstone (presumably Upper Devonian).

Type: No. 15341, Museum of Paleontology, University of Michigan.

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LITERATURE CITED

- ARNOLD, C. A. 1933. A lycopodiaceous strobilus from the Pocono Sandstone of Pennsylvania. *Amer. Jour. Bot.* **20**: 114-117.
- . 1932 (1933). Fossil plants from the Pocono (Oswayo) Sandstone of Pennsylvania. *Papers Michigan Acad. Sci., Arts and Letters* **17**: 51-56.
- COULTER, J. M., AND W. J. G. LAND. 1911. An American *Lepidostrobus*. *Bot. Gaz.* **51**: 449-453.
- , AND W. J. G. LAND. 1921. A homosporous American *Lepidostrobus*. *Bot. Gaz.* **72**: 106-108.
- HIRMER, M. 1927. *Handbuch der Paläobotanik*. München and Berlin.
- JONGMANS, W. 1930. *Fossilium Catalogus II: Plantae. Pars 16: Lycopodiales III*. Berlin.
- SCOTT, D. H. 1915. *Lepidostrobus kentuckiensis*, nomen nov., formerly *Lepidostrobus Fischeri*, Scott and Jeffrey: a correction. *Proc. Roy. Soc. London B*, **88**: 435-436.
- , AND E. C. JEFFREY. 1914. On fossil plants showing structure from the base of the Waverley Shale of Kentucky. *Phil. Trans. Roy. Soc. London B*, **205**: 315-373.