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A NEW SPECIES OF GOEPPERTELLA FROM  
THE HONGÄY COAL-MINE, TONGKING,  
FRENCH INDO-CHINA

By

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*With 1 Plate*

(Contribution from the Department of Geology and Mineralogy,  
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Two years ago when the senior author visited the Imperial Geological Survey in Tôkyô, he had the opportunity of examining the collection of fossil plants made by the late Dr. K. WATANABE, then the Chief Geologist of the Geological Survey, from the Hongäy coal-mine, Tongking, French Indo-China which had been stored in the survey. Most of the specimens then examined were beautiful ones familiar through many illustrations given by R. ZEILLER<sup>(1)</sup> in his valuable work on the fossil plants from the coal-bearing formations (mostly Rhaetic in age) of Tongking. Then the senior author's attention was directed especially to one of the specimens which exhibits a new type belonging to the interesting fern group, Dipteridaceae. Intending to examine the specimen more in detail, the senior author brought it back through the courtesy and permission of the collector, to the Department of Geology and Mineralogy, Hokkaidô Imperial University, however, there has been no opportunity to study the fossil until recently. Later, Dr. WATANABE was appointed to a Professorship of geology, Kyûsyû Imperial University, Hukuoka. But unfortunately, he met his death at Honto on August 13th of last year by a sudden illness while on a geological survey of the southern part of Karahuto.

Hearing of his lamentable death, the senior author again thought of the interesting fossil which Dr. WATANABE offered to our Depart-

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(1) R. ZEILLER: Flore Fossile des gîtes de charbon du Tonkin, 1903.

ment, and began to study the specimen with the collaboration of his colleague, the junior author. The result of the study revealed that the specimen was a new species belonging to a dipteridaceous fern, *Goeppertella*, and a new specific name *memoria-Watanabei* is proposed in memory of the late Dr. K. WATANABE who was so generous as to permit the study of the specimen which he himself collected from French Indo-China.

**Genus *Goeppertella* ÔISHI and YAMASITA**

On the Fossil Dipteridaceae. Journ. Fac. Sci., Hokkaidô Imp.  
Univ., Ser. IV, Vol. III, No. 2, 1936, p. 146.

***Goeppertella memoria-Watanabei* sp. non.**

Pl. XXXV, Figs. 1, 1a.

*Description*: Frond probably bipinnate; frond or penultimate pinna large, possibly reaching more than 30 cm. in length; its axis thin, about 2 mm. across, bearing laminae in one plane with the ultimate pinnae and on both sides of the axis, the lamina on each side being 10 mm. broad, deeply lobed into about 10 lobes with round apices and at a right angle to the axis of the penultimate pinna. Ultimate pinnae more than 6 cm. long, 3 cm. broad, subopposite, remotely attached, the distance being about 4.5 cm., and at a right angle to the axis. Axis of the ultimate pinnae also thin, being 1 mm. across. Pinnules 1.5–2 cm. long and 0.5–0.8 cm. broad, narrowing towards obtuse apices, subopposite, set closely, and fused laterally at the base; margin of pinnules usually undulating. Basal pinnules in each ultimate pinna reduced to mere lobes and merged into laminae on the axis of penultimate pinna. Nervation distinct, standing out clearly as relief. Midnerve of the pinnules is almost at a right angle to the pinnae-axis, straight and persists to the tip of pinnules. Secondary nerves are at a right angle to the midnerve and branch out frequently to form reticulum with each other and with the primaries. In the laminae attached to the axis of penultimate pinna, the nervation is quite similar to that of ordinary pinnules. Fertile specimen not known.

*Discussion and comparison*: General habit and the characteristic nervation of the specimen are dipteridaceous. Among six fossil

genera of Dipteridaceae<sup>(1)</sup>, *Hausmannia* (s.s.), *Protorhipis*, and *Camptopteris* are morphologically quite distinct from the present specimen; pinnae of *Clathropteris*, *Dictyophyllum* and *Thaumatopteris* resemble those of the specimen at hand, but there is a distinction in the mode of disposition of pinnae, those of the former two genera being disposed from two arms into which the top of the rachis is divided, while in *Thaumatopteris* the arms are extremely reduced and the pinnae are disposed in funnel-shape from the top of rachis. The remaining genus *Goeppertella*, with the category of which the present specimen agrees, is a fern more than bipinnate, with axis (or rachis) bearing laminae, thus differing in fundamental morphological character, from the other six fossil genera in Dipteridaceae. Therefore, the classification of the present name in genus *Goeppertella* is quite natural.

*Goeppertella* comprises two species, namely *microloba* (SCHENK)<sup>(2)</sup> and *varida* ÔISHI and HUZIOKA<sup>(3)</sup>; in the former the laminae borne on the main axis (or rachis) are simple; in the latter the main axis (or rachis) is thick and the pinnae are narrow, set closely and the pinnules are short.

*Remarks:* The slab of shale with the present specimen shows also fragments of *Goeppertella microloba* (SCHENK) and a fern resembling *Thaumatopteris Kochibei* (YOKOYAMA).

## EXPLANATION OF THE PLATE XXXV

### *Goeppertella memoria-Watanabei* sp. nov.

Fig. 1,  $\times 1$ ; Fig. 1a,  $\times 3$ .

Loc. Hongäy coal-mine, Tongking.

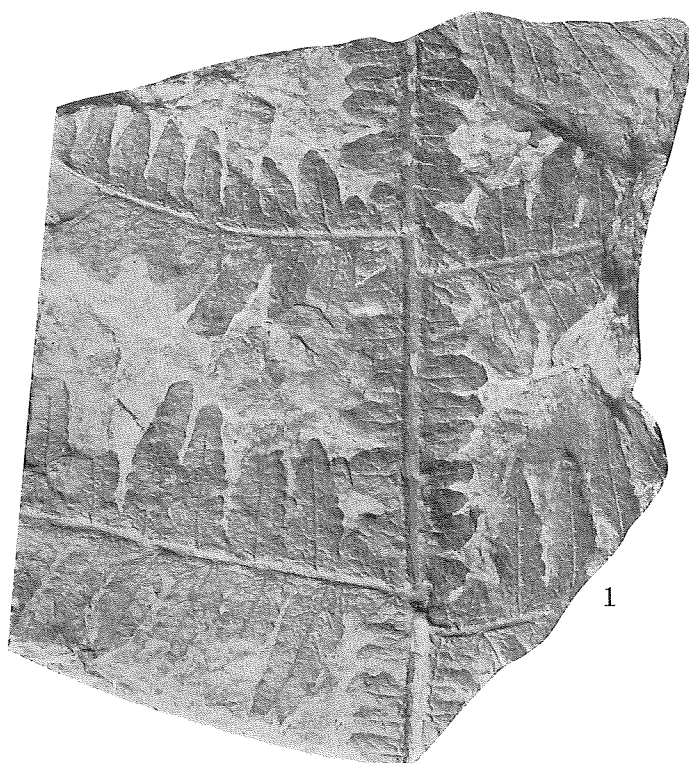
French Indo-China. Coll. by K. WATANABE.

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(1) S. ÔISHI and K. YAMASITA: On the Fossil Dipteridaceae. Op. cit.

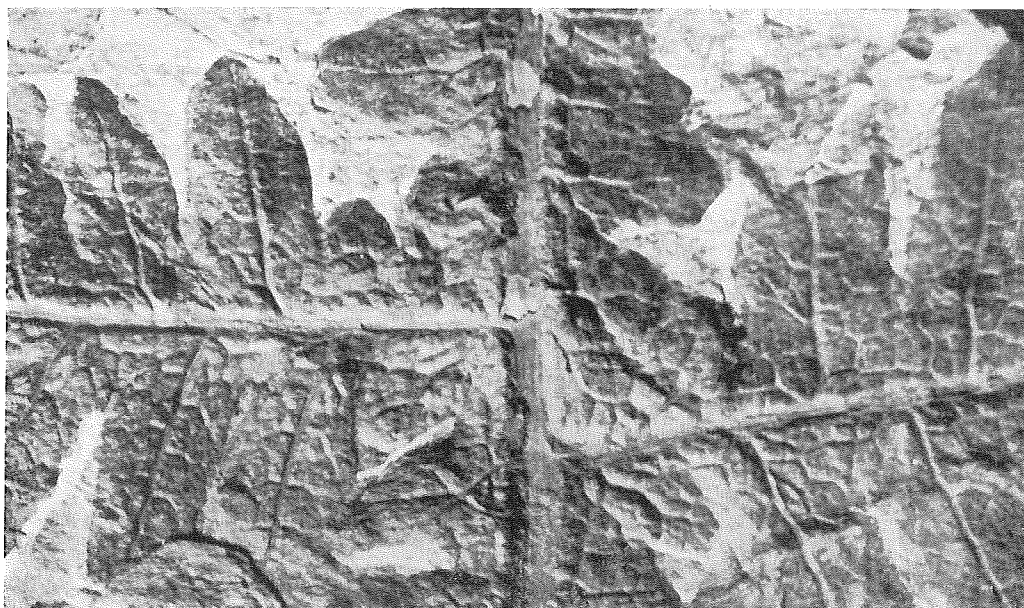
(2) R. ZEILLER: Flore fossile des gîtes de charbon du Tonkin. Op. cit., p. 91, pl. XVII, figs. 1-5 (described under the name *Woodwardites microlobus* SCHENK). See also ÔISHI and YAMASITA: On the Fossil Dipteridaceae. Op. cit.

(3) S. ÔISHI: The Mesozoic Floras of Japan. Journ. Fac. Sci., Hokkaidô Imp. Univ., Ser. IV, Vol. V, Nos. 2-4, 1940, p. 212, Pl. XXIII, figs. 1-3, 3a.



1

1a    × 3



*Kumano photo.*

*S. Ôishi and K. Huzioka: A New Species of Goeppertella.*