雜　　錄

Gigantopteris flora に就て

小泉源一 (G. Koidzumi)

古生植物代 (Palaeophyticum) 二疊石炭紀 (Permo-Carbon) に氷河を伴ひし南半球の Gondwana 大陸には、*Glossopteris*, *Gangamopteris* と稱する、舌狀單葉の比較的簡單な網狀脉を有する羊齒狀植物が特産し、氷河を伴はざる北半球の Eria 大陸には、複雜な羽狀複葉にして、網狀脉を有する小羽片を附けし羊齒狀植物なる *Linopteris*, *Lonchopteris* があり、Angala-Cathaysia 大陸には *Lonchopteris* に近似せる *Emplectopteris*, *Emplectopteridium*, *Dictycallipteris* 等の *Emplectopteridineae* があつた。

然るに Angala-Cathaysia 大陸のみは、網狀脉葉を有する羊齒狀植物に、尙一種特異な一群がありて、夾炭世 (Upper Carbon, Coal-Measure) の終 (Stephanian) 以來二疊紀の終りまで、各地到る處に廣分布をしてゐたやうである。本群の網狀脉は他のものと異り、單葉又は羽片に於て、必中助と側主脉と第三次脉とがあり、第三次脉は明に主脉性を示し之より網狀分岐をなすものと、第三次脉其者が直に網狀分岐に入るものとあり、各屬により frond の形態、網狀脉構成の狀を異にするが、多分一の羊齒狀植物群を成すものならんか。

二疊石炭紀に於ける Angala-Cathaysia 大陸は是等一群の羊齒狀植物の普偏的存在を以て著甚なるが故に、此大陸の此時代の植物區系の特色を代表せしむる爲めに、本群中の最も特色ある一屬 *Gigantopteris* をとり **Gigantopteris Flora** と呼ばんとする事恰も同じく Gondwana の Flora をば其特色屬 *Glossopteris* をとり **Glossopteris Flora** と稱するもの〻如くせんとするが如し。

Gigantopteris flora とは、1912年 D. White 氏 (Proc. U. S. Nat. Mus. vol. 41, p. 514, *1912*) が北米 Texas (the Wichita formation), Oklahoma (the Enid formation) の Red beds と稱する、二疊紀の早い時代の地層中にある化石植物群に、氏の所謂 *Gigantopteris americana* なるものを發見し、同時に Schenk 氏の支那湖南省、衡陽道永興縣、來河岸の *Gigantopteris nicotinaefolia* を含む化石植物群、及び Zeiller 氏雲南省宣威縣、水塘舖の *Gigantopteris* と稱するものを含む化石群をば Zeiller 氏に反し Lower Perm のものとし、南半球の *Glossopteris* flora に對して呼稱したものである。

其後矢部教授は東亞の *Gigantopteris* flora は三疊紀の初まで續けるものとの見解を下された (東北大學地質古生物紀要 IV. 2, 1917), 然し *Gigantopteris* の如き形態の

極致を示すものなどのでる內は二疊紀であつて、でなくなつたら三疊紀とすべきであらふ、然し之は當時北半球の氣候と時代とが並行したものとしての事である。

1927年 T. G. HALLE 博士は山西省太原炭田の *Gigantopteris* を含む石盒子統は亦 Lower Perm とした。

1933年今野円藏氏は古生代植物化石にて *Gigantopteris nicotinaefolia* を含む滿鮮の高坊山統をば上部二疊系と斷定され、*Gigantopteris Whitei* を含む下石盒子統を下部二疊系とされ、兎にも角にも *Gigantopteris* と稱するものを含む東亞の地層は二疊系とされたのは特筆すべし。

1935年 W. GOTHAN, W. J. JONGMANS 兩博士は Sumatra 島の Djambi 地方の Stephanian flora (Jaarboek var het Mijnwezen in Nederlandish-Indie, Negen en Vijftigste Jaargang, 1930, Verhandelingen, Tweede Gedeelte, 1935) に *Gigantopteris* と稱するものを發見し、*Gigantopteris* flora は更に上部夾炭世 (Stephanian) まで遡る事になり、此に全く南半球の二疊石炭紀 *Glossopteris* flora と對立するやうになつた。

然るに此 Angala Cathaysia の *Gigantopteris* flora なるものは、其 *Gigantopteris* と稱するものゝ形態に多種多様なるものありて、到底 *Glossopteris* や *Gangamopteris* の單一型なるに比すべくも非ず。從來 *Gigantopteris* と稱するものには數屬ありて、決して單一屬に非ざる事は既に予が Acta Phytotaxonomica et Geobotanica, vol. III (1934) p. 112 に述べしが如し。

眞の *Gigantopteris* は SCHENK 氏の *Gigantopteris* で *G. nicotinaefolia* を Genotype とする特徴のものに限り、*G. longifolius* KODAIRA, *G. elongatus* KAWAS., *G. Yabei* KAWAS, *G. persica* KODAIRA, ***G. Koiwaiana*** KOIDZ. nom. nov. (= *Gigantopteris* n. sp. KOIWAI in the Science Reports of the Tohok Imperial University, Sendai, Japan, second Series Geology, vol. IV. No. 2, 1917, p. 72, t. XV. fig. 1.) *G. Osinowskiensis* CHACHL. 等總べて高坊山統 (Upper Perm) のものゝみを含み、其他 *Gigantopteris* と稱するものは、次に記すが如く皆別屬である。

然し是等別屬も *Gigantopteris* と共に、一の人爲分類群なる ***Gigantopteridaceae*** を設けて一括し得ざる事はないから、*Gigantopteris* flora なるものは *Gigantopteridaceae* flora の意味に用ひられぬ事はない。

抑も眞の *Gigantopteris* とは Cathaysia の上部二疊紀に産する多分羊齒狀裸子植物にして、T. G. HALLE 氏の研究により Genotype たる *G. nicotinaefolia* の性狀明となれり、即ち本植物は羽狀葉の變態して釣狀体を具へる變形葉により他物にかゝり、攀緣上昇せし羊齒狀蔓性植物なりし如く、其葉は單羽狀の複葉なりし事は明にして、尙

其葉柄は一回叉狀に分岐せし事、往々一般に羊齒狀裸子植物の葉に見る如くなりしかとも考へらるゝ點あれど今は十分明白ならず、葉軸は頗る強太なるものにして、其兩側に大なる羽片を附け、羽片の大なるものは幅 20 cm. 長さ 30 cm. にも達し、葉の幅さは 25-40 cm. 長さ 60 cm. 以上にもなり、最大なるは多分幅さ 1 m. にも達せしかと思はるゝ偉大のもので、眞に其名の如きもので、到底三疊紀などの乾燥氣候の內に生活し得らるゝものではない。羽片は長楕円狀卵形又は長楕円狀被針形を呈し、大なる齒牙狀緣を有し、其中助は頗る太く、側主脉亦頗る顯著にして一見恰も双子葉植物の葉の如き形態を有し、最複雜なる網狀脉を有するものなれば、當時の Flora 中にては最顯著なる形態を有する一の特別屬なりき。

されば極て限られたる意味の *Gigantoptris* flora は唯東亞高坊山統の Flora 即ち Cathaysia の Upper Permian Flora のみの代表名とすべきものである。如何となれば本類網狀脉の始りは夾炭紀の Westphalian に *Lonchopteridineae* の如きものゝ出現にはじまり進み進んで最後に上部二疊に於て始めて *Gigantoptris* の如き複雜なる型に達したからである。

それで今從來皆樣が *Gigantopteris* と稱さるゝもの御記載を了解しつゝ總ての分類整理を試みれば次の如くである。

Fam. **Gigantopteridaceae** nov.

The Fern-like plants, its frond simple or compound. The well defined secondary costae of simple frond, pinnae or of pinnules, always are very distinct, rather close and open; the tertiary veins branches to anastomose or make the meshes by the mean of sutural veins combining the veinlets. Stephanian to upper Perm.

1, Sutural veins none or very indistinct
- a, Frond ribbon like, simple ..... *Gothanopteridieae*
- b. Frond compound
  - * Secondary costae very closely numerous ..... *Cardioglossieae*
  - * Secondary costae very distinct, the apex of lobules modifies into a hook ..... *Gigantopteridieae*

2, Sutural veins present
- * The tertiary veins pinnately or monopodially forked ..... *Palaeogoniopteridieae*
- * The tertiary veins dichotomously forked ..... *Cathaysiopteridieae*

1, *Palaeogoniopteridieae* nov.

Frond ribbon-like or pinnatifide, the tertiary veins pinnately branched or monopodially forked; there are almost always the sutural veins midway

between the tertiary veins, sometimes at the same time also are larger sutural vein formed between the secondary costae, and parallel with them.

Synopsis Generum

1, *Palaeogoniopteris*:

Frond pinnate, pinnae grandicrenate half sessile suddenly contracted at the distal base, but decurrent at the proximal base; secondary veins at a very wide angle to the midrib, copiously branching on each side, each opposite pair of the veinlets of the different cluster uniting in a sutural vein between the secondary vein, and the veinlets direct from the midrib also join with sutural vein; the only veinlets of proximal side of distal basal lobe often slightly anastomose.

2, *Gigantopteridium*:

Frond ribbon-like, forked, very rarely simple, slightly undurated at the margin; secondary vein branch freely and often in a monopodial manner, each vein giving off branches to right and left, and the branches of 2 adjascent tertiary veins seem to join, sometimes forming a more or less marked sutural vein midway between the tertiary veins; in the upper part of the frond the tertiary veins are less divided. The sutural veins between secondary costae are always parallel with them.

3, *Zeilleropteris*:

Frond unknown, the tertiary veins originating at a wide angle from the secondary costae, and loosely forked or pinnately branched on each side, and dissolving into several veinlets a little befor they reach the end; some one of the quaternary veinlets once forkes very rarely; each opposite pairs of the veinlets of different clusters uniting in a sutural vein between the tertiary veins; at the same time each opposite pairs of the clusters of quaternary veinlets also uniting in a sutural vein between the secondary costae.

1 **Palaeogoniopteris** nov. gen.

Frond lanceolate in outline, pinnate. Pinnae ovate oblong, the proximal base alato-decurrent to the next node, the distal base suddenly contracted, grandi-crenate, opposite, touching with decurrent wing, distant above; midrib stout, and originating at a acute wide angle to the rachis. Secondary veins distinct, originating at a very wide angle to the midrib, veinlets copiously forked or pinnate from this costae on each side in each lobe, each opposit pair of the veinlets of the different clusters uniting in sutura lvein between the secondary costae; and the veinlets direct from the midrib also join with sutural vein. The only veinlets of the proximal side of the distal basal lobe often slightly anastomose.

Palaeogoniopteris mengkarangensis (GOTHAN et JONGM.) KOIDZ. nom. nov.

Gigantopteris mengkarangensis GOTHAN et JONGMANS, in Jaarboek van het Mijnwezen in Nederlandish-Indie, Negen en Vijftigste Jaargang, 1930, Verhandelingen, tweede Gedeelte, 1935. p. 143, t, 47. fig. 2–4.

Loc. Horiz.: Sumatra: Djambi, Mengkarang (Coal Measure, Stephanian.)

2 **Gigantopteridium** KOIDZ.

in Acta Phytotax. Geobot. III (1934) p. 113.

The frond broadly ribbon-like, either abruptly constricted or gradually narrowed below, while becoming lobately incised at the base, petiolate usually, fasciculate and may have been developed along a rhizome; the lamina rather chartaceous, synpodially ? forking rather distantly at an angle of about 60°, and slightly narrowed at the point of bifurcation; the segments linear-lanceolate, rounded at the apex, penninerved, sinuate at the margin, convexity of outline opposit the secondary costae is presumably the normal condition, strongly convex on the ventral surface between the secondary costae; the midrib very broad, rigid greatly, deeply depressed and irregularly lineate; the secondary nerves emerge, equidistant and parallel, at a conspicuously wide angle from the rachis, ventrally depressed, nearly straight or with a slight outward turn toward the margin. They are little decurrent at the base, and taper slightly upward to near the border where they become rapidly effaced. The tertiary nerves originate somewhat regularly, at a wide angle from the secondary nerves, and also from the midribs. They rapidly diffuse in a somewhat fasciculate system by dichotomy into slightly divergent a nearly erect, straight nervilles, some of which may fork again. Similar nervilles spring directly from the secondary nerves and midribs. In the older or basal portions of the large frond, the tertiary nerves are more distinctly fasciculate, but in the higher areas, they are less divided, which near the apex, many of the nerves are simple. The veinlets in each fascicle tend to coalesce very obliquely with those from the next fascicle on the same side, so as to form interfascicular nerve between the secondary costae. The lateral union of the outside nerves of the fascicle and the junction of the cosequent interfascicular nerve or of the remaining nervilles with the sutural nerve effects a remarkable type of very elongated, variable, and angular areolation.

Gigantopteridium americanum (WHITE) KOIDZ. in Acta Phyt. Geob. III. p. 113 (1934)

Gigantopteris americana WHITE, in Proc. U. S. National Mus. vol. 41 (1912) p. 498, t. 46–48;– ADAMS, in Bull. Amer. Petrol. Geol. Assoc. Xvii.

1933. p. 1391. 2 fig.

Loc. Hor. America borealis: Oklahoma, Taxas, The lower Perm.

3 **Zeilleropteris** Koidz. nov. gen.

The frond obscure, but probably ribbon like; only the small part of the venation preserved; the midrib unknown; the secondary veins straight, the tertiary veins originating at a wide angle from the secondary costae, and loosely forked or pinnately branched on each side, and dissolving into several veinlets a little befor reach the end, some one of these quaternary veinlets once forkes very rarely, each opposite pair of the different clusters uniting in a sutural vein between the tertiary veins; at the same time each opposit pairs of the clusters of quaternary veinlets also uniting in a sutural vein between the secondary costae. In the venation of this fragment, there are sutural veins midway between the secondary costae and parallel with them, at the same time also similar sutural veins ars formed between the tertiary veins, so the meshes of anastomosing quaternary veinlets are very narrow rhomboidal.

Zeilleropteris yunnanensis Koidz. nov. gen. sp.

Gigantopteris nicotinaefolia (non Schenk) Zeiller in Annal. Mines 10 ser. tome XI. (1907) p. 480, t. 14. fig. 15, 15 a, (quoad specim. ex Sine-si-kou.)

Gigantopteris dentata (non Yabe) Koiwai in Sci. Rep. Tohok. Imp. Univ. ser 2, Geol. vol. IV. no. 2 (1917) p. 71, t. 16, fig. 6 (quoad specim. ex Sine-si-kou.)

Although Zeiller identified all his Yunnan specimens with *Gigantopteris nicotinaefolia*, and believed that the venation of a small fragment which does not show the margin of lamina is characteristic of that species; the venation of the specimens showing the dentate margin is very indistinct, and these 2 kinds of specimens are from a different locality and horizon, therefor there is a great dout in regarding 2 kinds of specimens are specifically identical. Zeiller's specimens from I-ioui-cho, Tou-tse, may be *Gigantopteris nicotinaefolia*, but a specimen fron Sien-si-kou has the quite different venation from those of *Gigantopteris nicotinaefolia*, it is very peculier in its meshes of anastomose having two sorts of sutural veins.

Loc. Hor.: China: Yunnan, Sine-si-kou,

2, ***Gothanopteridieae*** nov.

The frond ribbon like simple, straight or obscurly undulated at the margin; the secondary costae stout and very distinct, originate at right angle to the rachis, its apical portion forking into several veinlets;

tertiary veins freely branching and anastomosing to form a network of obliquely elongate meshes and there is not any principal tertiary veins; similar veinlets given off direct from the rachis between the secondary costae; the sutural vein between secondary costae generally very indistinct.

4 **Gothanopteris** gen. nov.

The frond probably simple, broadly ribbon like, probably very long. its margin grandi-crenate. Rachis robust very stout. The secondary costae originating at nearly right angle to the rachis, straight and parallel, forking into several veinlets and dissolving a little befor inside the margin. The tertiary veinlets freely branching and anastomosing to form a network of obliquely elongate meshes, but there is no any principal tertiary vein, the proximal ramifications of the basal tertiary veinlets join with those of the veinlets directly originated from the adjascent rachis. The sutural veins between the secondary costae generally very indistinct.

Gothanopteris Bosschana (GOTHAN et JONGM.) KOIDZ. nom. nov.

Gigantopteris Bosschana GOTHAN et JONGMANS, in l. c. (1935) p. 139, t. 46, t. 47. fig. 1

Gigantopteris americana (non WHITE) POSTHUMUS in Verslage Afd. Naturkunde, Kon. Akad. v. Wetenschappen, Amsterdam XXXVI (1927) p. 4.

Loc. Horiz. Sumatra : Djambi, Ketidoeransiamang, (Coal measure, Stephan.)

3, ***Cardioglossieae*** nov.

The frond pinnate or probably bipinnate ? the pinnae alternate or subopposite, distant, sessile, ovato-oblong to linear-oblong, slightly auriculate at the base, rounded at the apex, finely denticulate, midrib stout, secondary costae very closely numerous forming nearly right angle with midrib, the tertiary veinlets given off at about a right angle, each branching and anastomose with an opposite tertiary veins into a meshes of rectangular or polygon shape filling the very narrow interspace between the secondary costae.

5 **Cardioglossum** KOIDZ.

in Acta Phyt. Geob. III (1934) p. 112.

Cardioglossum antiquum (KAWAS. et KONNO) KOIDZ. in l. c. 113 (1934).

Gigantopteris antiqua KAWASAKI et KONNO, in Bull. Geol. Surv. Chosen, vol. Vi. no. 3 (1932) p. 34, t. 100. fig. 2,3.

Loc. Hor.: Korea borealis: Jido series (lower Perm) in Daido district.

4, *Cathaysiopteridieae*

The frond ribbon like simple straight or obscurely undurated at the margin; the secondary costae stout and very distinct, originate at right angle to the rachis, its apical portion forking into several veinlets; the tertiary veins dichotomously one to three times forked not anastomose, similar vein given off direct from the rachis between the secondary costae; tertiary veins from each 2 adjascent secondary costae meeting at a sutural vein extinding the whole distance from the rachis to the margin.

6 **Cathaysiopteris** Koidz.

in Acta Phyt. Geobot. III (1934) p. 113.

The frond broadly ribbon like, simple, very long, straight or obscurely undulated at the margin, abruptly contracted with a round-cordate base, traversed by the parallel ribs; rachis very robust; the secondary costae stout and very distinct originate at right angle to the rachis, its apical portion forking into several veinlets a little inside the margin; the tertiary veins dichotomously one to three times forked, not anastomose, similar veins given off direct from the rachis between the secondary costae; the tertiary veinlets from each 2 adjascent secondary costae meeting at a sutural vein extinding the rachis to the margin.

Cathaysiopteris Whitei (Halle) Koidz. l. c. 113. (1934)

Gigantopteris Whitei Halle, in Palaeont. Sinica, ser. A. vol. II. fasc. 1 (1927) p. 173, t. 47. fig. 1–9.

Loc. Hor.: China: Central Shansi, the lower Shihotse series (the lower Perm.)

5, *Gigantopteridieae* nov.

The frond large pinnate; pinnae not petiolate, dentate or grandi-crenate, but sometimes nearly entire; secondary costae with the distinct areolae along it, originating at a wide angle of generally 45°–70° with the costa media, running into the marginal teeth; principal tertiary vein distinct or all freely branching at once to anastomose each other; rarely similar veinlets given off direct from the costa media between the secondary veins, there is no any sutural vein; the apex of pinnular lobes often modifies into a hook. The climbing plants of the scrabling type, often having the hook branches modified from the leaf.

Conspectus generum

Gigantonoclea:

Pinnae lanceolate grandi-crenate, suddenly contracted below, but decurrent at the proximal base of the upper pinnae, tertiary veins are

finely branching and anastomosing without any principal ones; pinnular lobes often modifies into hook at the apex; no fine veinlets given off direct from the costa media.

Gigantopteris:

Pinnae broadly oblong-ovate to lance-oblong, grandi-dentate, rarely nearly entire, never decurrent at the base, rapidly contracted below and narrowing more gradually to the acut apex; the tertiary principal vein always distinct and having areolae along it, the quaternary veinlets finely branching and anastomosing without any principal one; the apex of some dentation produce into a hook; plant often scandent by hooked tendrils.

7 **Gigantonoclea** Koidz. nov. gen.

Frond very large pinnate. Rachis very robust striated. Pinnae lanceolate to oblong-lanceolate ; the upper ultimate pinnae are only slightly crenate or entire, the lamina quite free from the rachis on the distal side of the midrib. The proximal half of the lamina is broadly decurrent, the decurrent part of the subopposite pinnae forming together a characteristic triangular wing-like expansions. The lower pinnae are not decurrent, rounded at the base, grandi-crenate. The secondary veins arising at an angle of 60°–70°, breaking up little befor reaching the margin, with the indistinct areolae along it; the tertiary veins freely branching and anastomosing without any principal ones, no veinlets arising directly from the costa media, but in the decurrent appendages, the secondary veinlets arise directly from the main rachis.

Gigantonoclea Lagrelii (Halle) Koidz. nom. nov.

Gigantopteris Lagrelii Halle, in Palaeont. Sinica, ser. A. vol. II. fasc. 1, (1927) p. 170. t. 46.

Loc. Horiz.; China: central Shansi, the lower Shihotse series (the lower Perm.)

8 **Gigantopteris** Schenk

ex Potonie in Engl. et Prantl, Nat. Pfl. Fam. I. 4, (1902) s. 513.

Megalopteris (non Dawson) Schenk, in Richthopen Chinas Bd. IV (1883) p. 238.

The frond very large, pinnate with a large terminal segment, which is pinnati-partite or pinnatifid in its lower part and becomes gradually almost entire toward the apex. The main rachis stout often very strong, longitudinally striated. The pinnae generally opposite or subopposite, touching each other laterally or slightly overlapping, or distant, not petiolulate, the base rarely auriculate or often at least proximally decurrent in the superior pinnae ; often very large, oblong-lanceolate to ovate, rapidly

contracted below and narrowing more gradually to the acute or abruptly caudate apex. The margin of pinnae dentate, sinuate, or almost entire, the teeth corresponding each to one secondary vein is projecting in the direction of the vein, often very sharply pointed and modifies into the hook, the organ of climbing. The secondary costae distant, running out into the marginal teeth, with the distinct areolae along it ; tertiary veins also with the distinct smaller areolae along it and giving off fine lateral quaternary veinlets and breaking above ; the quaternary veinlets branching and anastomosing with each other ; no sutural veins, no veinlets given off direct from the costa media, but rarely the tertiary veins branching directly from the midrib. It was a climbing plant by the naked frond destitute of whole lamina, its rachis very hard and woody having the branches ended in sharp hookes,the organ of climbing.

Gigantopteris nicotianaefolia SCHENK.

Loc. Hor.: The upper Perm (the Kobosan series) of China, Manchuria and Korea.

Prof. HALLE suggested in 1927, that the leaves of this species were forked, since two pinnate specimens from Shansi have been found in a position which suggested that they may have been borne by a common petiole ; but since that time no decisive information is available on this point. The largest pinna probably was not much more than 26 cm in length, with a breadth of 20 cm ; and the compound leaf may measure generally about 25–40 cm in breadth, 60 cm long ; probably much larger leaves were exceeding a meter in breadth ; the rachis may attain a breadth of 1 3mm and probably more.

Gigantopteris persica KODAIRA.

Korea borealis: Kogen coal field, the Kobosan series.

Gigantopteris longifolius KODAIRA.

Korea borealis: Kogen coal field, the Kobosan series.

Gigantopteris elongatus KAWASAKI.

Korea: the Kobosan series.

Gigantopteris Yabei KAWASAKI.

Korea: the Kobosan series ; China: Szechuen, the upper Perm.

Gigantopteris Koiwaiana KOIDZ. nov. nom.

Gigantopteris nov. sp. KOIWAI, in the Science Reports of the Tohoku Imperial University, Sendai, Japan, 2 ser. Geology, vol. IV. no. 2, 1917, p. 72, t. XV. fig. 1.

Loc. Hor. China: Fukien, the upper Perm.