98. A Lower Devonian Faunule from North Manchuria*.

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(Comm. by H. YABE, M.LA., Oct. 12, 1942.)

Recently, Mr. M. Noda, curator of the Central Museum of Manchoukuo, Sinkyo, forwarded the senior author a set of fossils that was found in a blackish sandy shale, forming the basement of the second dredger of the Nichiu-ho placer, Nunkiang-hsien, Peian-hseng1, North Manchuria. The material consists only of a tabulate coral, a tetracoral, and two brachiopods, namely,

Pleurodictyum nodai, sp. nov.
Syringaxon (?) sp.
Stropheodonta cf. sedgwicki d'Archiac et de Verneuil
Brachiopoda, gn. et sp. indet.

That the age of the fossiliferous deposit is Coblenzian seems highly probable; this is the first record of the occurrence of Lower Devonian fossils in Manchuria2.

The authors are grateful to Mr. Noda for his courtesy in sending these interesting fossils, which are now deposited in the Museum of the Institute of Geology and Palaeontology, Tōhoku Imperial University.

Pleurodictyum nodai, sp. nov.

Fig. 1 a, b.

Only an impression of the calicular surface of coral colony at disposal; Reg. No. 66401.

Original form of coral colony unknown, probably discoidal, as in many allied forms; calicular surface nearly circular in outline, 35 mm in diameter, and showing 8 polygonal calices which are 5–10 mm broad. The largest calice, probably of a parent corallite, lies excentrically. Walls prominent, 1.2 mm broad and elevated about 1 mm above calicular floor; granulated on upper margin and penetrated by numerous mural pores less than 0.5 mm broad. Septal ridges represented by more than 10 vertical rows of blunt spines. Calicular centre not distinct, but apparently lying very excentrically in all calices, always nearest the imaginary axis of corallum, thus causing the septa of all the calices to appear as if they are arranged radially toward the centre of the general calicular surface:—a feature perhaps due to the very oblique disposition of calices of exceedingly divergent corallites with reference to the imaginary axis of the colony.

* One of the researches done in 1942 with the aid of a grant from the Imperial Academy.
1) 北安省徳江縣泥漿河.
2) In the June number of the Proceedings, T. Kobayashi reported on a discovery by R. Kondo of several fossils, including Spirifer cf. tonkinensis and a phacopid, in a limestone exposed at 41 km ENE of Huolungmen, Nünkiang-hsien; Eifelian in age.
Remarks: *Pleurodictyum* is a genus established by G. A. Goldfuss in 1829, on *P. problematicum* Goldfuss, from the Coblenzian of Eifel, Germany. The geological range of the genus is Upper Gotlandian to Upper Carboniferous. Besides some doubtful forms, 16 species are now known of the genus, namely 1 species in the Upper Gotlandian, 11 species in the Devonian, 3 species in the Lower and 1 species in the Upper Carboniferous. Most of the species from the Devonian being from its lower division, the Lower Devonian is the culminating stage of the corals of this genus.

The species of this genus are mostly from Europe, with only 3 (1 species each from the Gotlandian, Devonian and Upper Carboniferous) from elsewhere. From eastern Asia, we have but one record by H. Mansuy of a rather dubious form from the Gotlandian of the eastern part of Tonkin, French Indo-China.

The Manchurian specimen is characterized by its relatively large corallites, resembling in this feature *P. megastomum* Dun from the Upper Gotlandian of Australia and *P. constantinopolitanum* F. Roemer from the Lower Devonian of Istanbul. The first of the latter two foreign forms was described in detail by W. S. Dun, F. Chapman, and R. B. Wither as having more numerous septa than in the Manchurian specimen; moreover, it has a different growth-mode, with the parent corallite lying at the centre of the calicular surface and surrounded by the others at the growth-stage of 8 corallites. The superficial resemblance of the two chiefly depends on similar sized and similar shaped corallites and an apparent radial disposition of the septa of all the corallites from the imaginary axis of the coral colony. According to W. Weissermel, in *P. constantinopolitanum*, which also shows the last named feature, the corallites are usually 6-8-sided, instead of 6-sided or less, as in the Manchurian specimen.

*Pleurodictyum (?)* sp. of Mansuy, from the Gotlandian of Indo-China, is based on an imperfect specimen, which differs from the Manchurian form, at least, in having a greater number of smaller corallites.

*Syringaxon (?)* sp.

Fig. 2.

Only a more or less deformed impression of calicular face at disposal; Reg. No. 65299.

Corallum simple, small, calice either oval or round, 5 mm in diameter. Septa more than 18, with smooth (?) upper margin which slight-

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1) G. A. Goldfuss: *Petrefacta Germaniae*, p. 113, 1826.  
Fig. 1 a, b. *Pleurodictyum nodai*, sp. nov. b, free hand sketch. Nearly twice enlarged.

Fig. 2. *Syringaxon (?)* sp. Retouched. Nearly ten times enlarged.

Fig. 3. *Stropheodonta cf. sedgwicki* d'Archiac et de Verneuil. Nat. size.

Fig. 4. Brachiopod, gn. et sp. indet. Nat. size.
ly slopes down from periphery of corallum to its centre. Major septa 13, of which 6 united around the centre of calice to form an aulos 1 mm broad, which encloses a very narrow, rounded-hexagonal hollow inside; the remaining major septa somewhat shorter, never extending to aulos. Minor septa more than 5, precise number not countable owing to imperfect preservation; always slender and one half as long as longer major septa. Internal structure of corallum unknown.

Remarks: *Syringaxon* Lindström, 1882, has *S. silurense* (M'Coy) from the Upper Gotlandian of England as its genotype; the geological range of this genus (s.s.), with more than 30 species, is Middle Gotlandian—Middle Devonian. Later J.W. Butler¹ revised its generic diagnosis to

"Small, simple, conical, or cylindrical rugose corals in which the axial ends of the major septa are dilated and laterally contiguous, forming an inner wall or aulos. The tabulae, which are few in number and irregularly spaced, are divided by the aulos into an inner and an outer series; the inner tabulae are flat or slightly depressed; the outer tabulae vary in form, but generally slope upwards from the epitheca to the aulos. Dissepiments are absent. Streome is usually abundant, and cements the axial ends of the inner septa to the sides of the major septa."

Examining serial sections of this simple coral, Butler¹ further notes that, in the mature stage of growth, all the major septa unite to form an aulos at the centre of the calice, while in the younger stages, the early members of the major septa alone take part in the building of aulos. It is possible that the Manchurian specimen is an immature individual of a *Syringaxon*.

Much light has recently been thrown on the real nature of *Syringaxon* and its related genera by the studies of A.W. Grabau², F. Prantl³, and others. Of the many species hitherto known of the genus *Syringaxon* (s.s.), the following two resemble more or less the Manchurian specimen, namely, *Syringaxon (?)* sp.⁵ from Prinkipo Island and *S. (?)* sp. from Apostol⁶, both described by Weissermel from the Upper Coblenzian of Bosporus; the first of the latter two especially is similar to the former in the size of corallum, the number of septa, and in the narrow, round aulos, though distinguished by the possession of 19 major septa.

Another resemblant of the present species is *S. bohemica* Barrande, from the Lower Devonian of Bohemia, which Prantl⁷ later distinguished from other varieties or subspecies as *S. bohemica bohemica*; it possesses 17 major septa in an equal-sized corallum, instead of 13 as in the present species.

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²) A. J. Butler: Op. cit., p. 120.
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Stropheodonta cf. sedgwicki d'Archiac et de Verneuil.

Fig. 3.

A pedicle valve examined; Reg. No. 65300.

Dimensions (mm)
- Height... 35; breadth... 45; depth... 5 (?).

Shell semicircular, a little broader than high, broadest at hinge line (or slightly below hinge line?); cardinal angle 70°; somewhat convex except almost flat umbonal part, and geniculated near anterior border. Surface bearing radial ribs of two kinds; nearly 40 larger ribs moderately prominent, prominence decreasing and intervals gradually lessening towards cardinal extremities, alternating with interstitial groups of much finer ribs or raised striae.

Remarks: Although owing to the nature of the hinge area and the details of the interior are unknown, the generic position of the brachiopod can not be definitely settled, its superficial resemblance to Stropheodonta sedgwicki d'Archiac et de Verneuil, as described by F. Drevermann from the Siegen beds of Siegen, Germany, is so strong that the present authors were led to believe in their close affinity, if they are not specifically identical. The German species is somewhat lower than the Manchurian specimen, a difference seemingly insignificant, seeing that the former is more or less variable in this feature. Drevermann described the surface-ornament of his material as follows:

“Sie besteht aus dichtgedrangten Radialrippen, sie sich durch oftmals wiederholte, schon unweit des Wirbels beginnende Dichotomie und Einschiebung neuer Elemente vermehren. Ausserdem sind feine radiale Linien vorhanden, die die ganze Schale bedecken, jedoch besonders von der Mitte aus bis zum Stirnrand sehr zahlreich werden und an Rande selbst, wie zu beiden Seiten Wirbels auf den Flügeln den wesentlichsten Teil der Skulptur bilden.”

This description applies well to the Manchurian specimen at disposal, specific identification here being reserved only because the generic features of Stropheodonta are not exhibited by this specimen.

Brachipoda, gn. et sp. indet.

Fig. 4.

The other species of brachiopod (Reg. No. 66402), generically indeterminable, is also represented by a single pedicle valve, which is almost flat, semicircular, broadest at hinge line, about 80 mm broad and 45 mm high; its entire surface uniformly sculptured with numerous, crowded, fine, radial striae at equal intervals. It reminds one of Stropheodonta, Leptostrophia, Schuchertella and the like. Internal features being unknown, its generic position is uncertain.

The first three forms mentioned above give certain hints regarding the geological age of the fossiliferous deposit of the Nichiu-ho.

We have stated above, that *Pleurodictyum* ranges from Upper Gotlandian to Upper Carboniferous, with a large number of species in the Lower Devonian, while *Syringaxon* (?) sp. resembles most some Lower Devonian forms from Bosporus and Bohemia, and the *Stropheodonta S. sedgwicki* from the Lower Devonian of Germany. On these fossil evidences the fossiliferous sandy shale is now regarded by the present authors as being Lower Devonian, especially Coblenzian.

In the Japanese Islands, the Lower Devonian is represented by the Ono series\(^1\) of the Kitakami Mountainland, which consists of adinole slate and limestone in its lower part and adinole slate alone in the upper; the latter, which is approximately of Coblenzian stage, and yields only radiolarian remains, is not comparable with the Nichiu-ho deposit, the two being in entirely different facies.

Although Devonian sediments are not known from North China, they are well developed in South China, while the marine Lower Devonian rocks seem to be restricted in distribution, being represented only by the Supai shale of Kwangsi\(^2\), and the Pochiao series of Yunnan\(^3\); it is believed that these can be correlated with the Coblenzian by means of such brachiopods as *Spirifer paradoxus orientalis* Joh, and *S. hercyniae kwangsiensis* Joh and a number of others. The South China fauna has no species allied to those now known from the Nichiu-ho shale.

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