On Some Ordovician Nautiloids from Shuo-hsien in the
Chinpei (晋北) Region, Menchiang (蒙疆)
(Sino-Mongolian Borderland)*

By

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(Received May 4th; read May 24th, 1941.)

Not long ago, Mr. Yosio ONUKI procured three specimens of nautiloids from a spot on the highest place in the mountain pass which leads from the castle of Shuo-hsien (朔縣) to the village of Li-min-pao (李民堡), the pass being located to the southwest of Ta-ch'ung-wê-ts'un (大蟲窩村) and east of Hsing-chuang (新庄). The specimens were given to me for study. For this courtesy I wish to take this opportunity to thank Mr. ONUKI, of the Manchurian Railway Company. The specimens are now kept in the Geological Institute, Imp. Univ. Tokyo. They were found in boulders of light gray limestones with irregular dolomitic patches. At a glance one of the specimens appears very similar to *Orthoceras chinense*, and I thought it belonged to the species. But on making a polished longitudinal section I found that it had a siphuncle in fusiform. Although the intracameral deposit is mostly recrystallized, it seems highly probable that the stereoplasmic deposits were present on the two sides of the septum. It belongs most probable to *Stereoplasmoceras*. It is noted that this is the largest specimen of the genus which I have ever seen. The second specimen is identifiable with *Armenoceras coulingi*, but this is again very large, and in fact it is the largest specimen among armenoceratids so far known in Eastern Asia. The third specimen is similar to the second but their specific identity can not be made. The limestone formation from which these fossil-bearing boulders came, belongs unquestionably to the Toufangian series. The aspect of the rock containing the fossils is also typical of the Toufangian rock.

None of the Ordovician fossils have been described from the borderland between China and Mongolia. WANG¹⁾ mentioned in 1921 that the Ordovician formation is missing in the vicinity of Tatung (大同) where the Cambrian formation is directly overlain by the Permo-Carboniferous. Recently however UEDA²⁾ found an Ordovician formation of 100 metres' thickness lying unconformably below the Permo-Carboniferous formation but no fossil was found. According to SUN³⁾ the Ordovician is apparently absent in Suiyuan. Therefore this occurrence

* Transactions of the Palaeontological Society of Japan, No. 131.

1) C. C. WANG: (1921), The Coal-Field of Tatung. Shansi Bull. Geol. Surv. China, No. 2.

2) F. UEDA: (1939), On the Salt-Pseudomorph found in the Southeastern Part of the Tatung Coal-field, Shansi. Jour. Mining Manchuria (滿洲礦業協會報告), Vol. 5.

3) C. C. SUN: (1934), Geology of Suiyuan and Southwest Charhar. Mem. Geol. Surv. China, Ser. A. No. 12.

of the fossils described here shows that the Tatung-Shuohsien district lies roughly on the northern boundary of the Tsinan basin in the Ordovician period.

Stereoplasmodoceras sp.

Figs. 1—2 on plate 10 (3)

The conch measures about 46 mm. in length. Its diameter gradually tapers at the rate of 1 mm. in every 1 cm. or a little more of length; septal distance is nearly constant. Septa are separated from one another by an interval of a little less than 6 mm. in the adapical part and by a little more than 6 mm. in the adoral part. The specimen was cut into two parts and the adoral one was polished. Siphuncle is located near the center of the conch but its relative position to the conch cannot be exactly determined. On the longitudinal section the siphuncle is fusiform. Its breadth measures 3 mm. and 5 mm. where the conch is respectively 18 mm. and 28 mm. wide. The septum is gently convex; septal neck describes a broad curve. As the calcareous deposits in the camera are mostly recrystallized, the mode of stereoplastic encrustation on the walls of the camera cannot be determined, and accordingly its specific determination can not be made. However, it appears similar to *Stereoplasmodoceras liaotungense*¹⁾.

Armenoceras coulingi, (GRABAU)

Figs. 3—5 and (?) 6—7 on plate 10 (3)

- 1903 *Actinoceras* (*Ormoceras*) off. *tenuifilum* CRICK, Geol. Mag., N. S. Dec. 4, Vol. 10, p. 481, pl. 22, fig. c.
- 1920 *Actinoceras* (*Ormoceras*) sp. indt. YABE, Paleontology of Southern China, p. 53, pl. 19, fig. 9.
- 1922 *Actinoceras coulingi* GRABAU, Palaeontol. Sinica, Ser. B, Vol. 1, fasc. 1, p. 83, pl. 8, figs. 1-2.
- 1927 *Actinoceras coulingi* KOBAYASHI, Japan. Jour. Geol. Geogr., Vol. 5, p. 193, pl. 21, fig. 6.
- 1932 *Armenoceras bassleri* ENDO, U. S. Nat. Mus. Bull., 164, p. 83, pl. 22, figs. 5, (3), 6; pl. 40, fig. 12.
- 1934 *Armenoceras coulingi* KOBAYASHI, Jour. Fac. Sci. Imp. Univ. Tokyo, Sect. 2, Vol. 3, pl. 8, p. 456.

One of the armenoceroid-specimens at hand is about 18.5 cm. long. This was cut into two parts and polished to see the transverse and longitudinal sections. Fig. 4 shows the longitudinal section of the adapical part 90 mm. in length which was cut laterally across the siphuncle. The breadth of the conch increases 1 mm. in every 5 mm. The siphuncle is nearly uniform in breadth. The last but one nummulus is 3 mm. long; its diameter measures 10 mm. and 13.5 mm. at the septal neck and at midway between the necks respectively. The breadth of the siphuncle decreases very slightly from the adapical to the adoral side. The intra-siphuncular structure is not preserved except a few traces of radial canals. Septa are also not well preserved. Where the intracameral stereoplastic deposition is advanced, the deposit and septum are mostly recrystallized. Insofar as I can see on this specimen the septum is nearly straight, and sharply bent back at the septal neck. Its brim is adnated with the septum proper for a short distance.

The siphuncular segment is somewhat protruded antero-laterally and the posterior part of the connecting ring is in contact with the preceding septum for some

1) For the *Stereoplasmodoceratids* the reader is referred to my paper "On the *Stereoplasmodoceratidae*" in Japan. Jour. Geol. Geogr., Vol. 13.

relatively long distance. The stereoplastic deposit encrusts both sides of the septum and the surface of the deposit is irregular. The deposit is less developed on the adoral than on the adapical side. In the adoral part of the specimen, 91.5 mm. in length, the camerate portion is mostly broken off and lost. The siphuncular surface is eroded.

The position of the siphuncle cannot be exactly determined, but it is probably off-center. The gradual expansion of the conch, almost cylindrical siphuncle, the mode of intracameral stereoplastic deposit and other features seen on the specimen are characteristic of *Armenoceras coulingi*. It is especially similar to GRABAU's specimen in fig. 1 on pl. 8 which is selected as the holotype of the species. In GRABAU's the conch expands until it attains a breadth of 3.2 mm. or so. In this specimen the breadth of the conch increases till it attains a maximum of about 40 mm. The septum is a little more oblique in this than in GRABAU's. In the specimen which I described from Toufangkou in 1937 the outline of the conch is not well preserved, but the conch seems to be very slowly expanding. In these specimens the siphuncle is nearly uniform in breadth and the annulated part of the siphuncular wall is always projected antero-laterally, instead of laterally in many other armenoceratids in Eastern Asia.

In another specimen the conch is remarkably flattened on the ventral side. Although the dorsal side of the conch is not preserved the cross section of the conch is presumably ovately triangular. The siphuncle is located at a short distance from the ventral side and the siphuncular segment is uniform in length, but the length is a little shorter than that of the preceding specimen. In the siphuncular position this appears similar to *Armenoceras submarginale*, but is quite different in the short and uniform length of the siphuncular segment, and furthermore in the outline of the segment in the longitudinal section. In my opinion it belongs probably to the same species as the preceding.

Explanation of Plate 10 (3)

Stereoplasticoceras sp.

- Fig. 1. Adoral part of the specimen. $\times 1$.
Fig. 2. Septal neck and connecting ring. Strongly magnified.

Armenoceras coulingi, (GRABAU)

- Fig. 3. Adoral part. $\times 1$.
Fig. 4. Adapical part. $\times 1$.
Fig. 5. Cross section of the adapical part. $\times 1$.

Armenoceras cfr. *coulingi*, (GRABAU)

- Figs. 6-7. Transverse and longitudinal sections. $\times 1$.

蒙疆晋北政廳管内朔縣産奥陶紀鸚鵡貝化石に就いて (摘要)

小 林 貞 一

朔縣より李民堡に至る間の大蟲窩村西南最高峠に於いて小貫義男學士の採集せられた化石 3 個を検するに

1. *Stereoplasmoceras* sp.
2. *Armenoceras coulingi* (GRABAU)
3. *Armenoceras* cfr. *coulingi* (GRABAU)

にして, 1, 2 は共に著しく大型なり。之等鸚鵡貝化石に依り此の地方に豆房統の存在を確め得たり。此の地方は大略現在知り得る奥陶紀済南盆地の北境に當る。