ART. XLIII.—A *New Cephalopod from the Silurian of Pennsylvania*; by RUTH RAEDER MOOK.*Introduction.*

DURING the summer of 1913 while working on the Bloomsburg Red Shale and the overlying limestones, in a limestone quarry about 7 miles southwest of Bloomsburg, Pennsylvania, the writer's attention was called to a rare cephalopod collected and owned by Mr. Guy A. Mowry of Grovania. The specimen was first discovered by quarrymen while excavating rock to be sent to the lime kilns. Mr. Mowry, who has carefully collected fossils for some years, was called in to make a careful note of the exact position and horizon of the specimen. The fossil was found in a bed of limestone, generally known in eastern Pennsylvania as the Bossardville, of Upper Silurian age.

So far as can at present be determined, a similar form has not yet been described for the United States, and because of its apparent rarity it has seemed worth while to call attention to it. Mr. Mowry has therefore kindly loaned the specimen for the purpose of description.

The name *Trochoceras grovaniense* is here proposed for this new species.

The genus Trochoceras.

The genus *Trochoceras* was proposed without any concert of action by Barrande in 1848 and Hall in 1852 for fossil species generically similar but not generically identical. At a meeting of the "Freunde der Naturwissenschaften in Wien," on September 10th, 1847, Dr. Franz v. Hauer called the attention of the members to some new cephalopods from the Silurian of Bohemia, which had been sent in by Barrande. The proceedings of this meeting were published in 1848.* The report included Barrande's original description of the genus *Trochoceras*, which reads as follows:

"*Trochoceras* (Barrande). The shell is characterized by the peculiar nature of its enrollment. The revolutions are laid upon one another in a spiral manner, so that the shell itself is not symmetrical. *Trochoceras* parallels therefore the genus *Turritites* in the family of the *Ammonitidae*. All the species which Barrande discovered belong to the lower division of the

* Berichte über die Mittheilungen von Freunden der Naturwissenschaften in Wien: gesammelt und herausgegeben von Wilhelm Haidinger, iii, Nr. 1-6, p. 264, July-December, 1847. Vienna, 1848.

Upper Silurian System.* No genotype was named. In a later volume of the same publication a list of species was

FIG. 1.

FIG. 1. Pencil drawing of type specimen of *Trochoceras grovaniense*, sp. nov. 7/16 nat. size.

given. In this list *Trochoceras davidsoni* was mentioned first and this is therefore Barrande's genotype.†

* Loc. cit., p. 266 : "*Trochoceras* (Barrande). Durch die Art der Einrollung der Schale characterisirt. Die Umgänge sind nämlich in einer Schraubenlinie aneinandergelegt, so dass die Schale selbst nicht symmetrisch ist. *Trochoceras* entspricht demnach dem Geschlechte *Turritiles* aus der Familie der *Ammonitidae*. Alle Arten, die Barrande auffand, gehören der unteren Abteilung des oberen silurischen Systems an."

† Haidinger's Berichte, IV, p. 208, 1848.

The name proposed by Hall was printed in the second volume of the *Paleontology of New York* in 1850, although the volume was not issued until 1852.* Hall's genotype was *Trochoceras gebhardi*. His original description of the genus follows:

"Turbinate or trochiform; spire elevated, more or less ventricose, umbilicated; aperture rounded or round oval; volutions above the outer one septate; siphuncle submarginal or dorsal.

"In the specimen from which the generic description is principally made, the septa are strongly arched from the inner basal angle of the volution to the outer one, advancing on the outer angle towards the aperture." In the above description owing to a confusion of terms the siphuncle is recorded as submarginal or dorsal, whereas in present day usage it would be recorded as submarginal or ventral.

In 1894 Hyatt pointed out that Hall's species are quite distinct from Barrande's, and that they do not belong to any genus yet described from Bohemia. *Trochoceras* Barrande is not generically identical with *Trochoceras* Hall. Hyatt suggested that the name *Trochoceras* Barrande be retained and for Hall's forms *Trochoceras gebhardi* and *turbinatum* he proposed the new name *Mitroceras* with *Mitroceras* (*Troch.*) *gebhardi* as the genotype.† *Mitroceras* Hyatt differs from *Trochoceras* Barrande in the high turbinate spire, and in the deep and sharply angulate umbilicus.

Reasons for assigning the new species under discussion to the genus Trochoceras.

The formation in which the specimen under discussion was found has undergone little diastrophic movement. The beds dip at an angle of about 40 degrees to the south, but outside of uplifting and tilting there is no evidence of any great disturbance such as twisting, mashing, etc. In the overlying formation, the so-called Bastard limestone, fossils are abundantly preserved and show no evidences of distortion. The specimen under discussion is considerably warped, apparently indicating that it was a low spired trochoceracone rather than a flat nautilicone; its warped condition then can be reasonably explained by the normal crushing of a cone-shaped shell.

Trochoceras grovaniense sp. nov.

Shell large, probably trochiform; spire very slightly elevated; maximum diameter 158^{mm}; diameter of outer whorl

* *Paleontology of New York* by James Hall; vol. ii, p. 335. Albany, 1852.

† Phylogeny of an Acquired Characteristic. Alpheus Hyatt. *Proc. Amer. Phil. Soc.*, vol. xxxii, No. 143, p. 502, 1894.

about 25^{mm} (varying according to state of compression); number of whorls 4, the outer one incomplete; increase in diameter of whorls *very* gradual; diameter of inner whorl about 10^{mm}; septa simple, very slightly curved, about 4^{mm} apart on outer whorl and 3^{mm} apart on inner side of inner whorl; annulations on outer whorl about 2.5^{mm} apart; siphuncle ventral.

Owing to the crushed condition and poor preservation of the shell the extent of the elevation of the spire is unknown. From the irregular warped surface of the specimen it seems reasonable to suppose that the spire was very broad and low. The exact nature of the umbilicus is indeterminate; presumably it was broad, shallow, and not angular. The precise character of the siphuncle is also unknown. There is only one place on the shell where the siphuncle appears; here it is only very poorly preserved. Its ventral position, however, can be determined.

Trochoceras grovaniense seems most nearly related to *T. priscum* Barrande, Etage₂ of Bohemia. It differs from the latter in its greater size, more gradual increase in the size of the whorls, and in having the septa straighter and slightly farther apart.

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