

ART. XVII.—*Some Lower Silurian Graptolites from Northern Maine*; by W. W. DODGE.

EIGHT years ago I pointed out a newly found graptolite locality in Penobscot County, Maine,* about seventy-five miles north of Bangor and twelve east of Mt. Katahdin. I have since obtained a few additional specimens there, and now report them for the evidence they give as to the age of the rocks in which they occur.

The entire list of determinable forms before me is as follows:

1. *Helicograptus gracilis* Hall (sp.)
2. *Dicellograptus*?
3. *Diplograptus*, n. sp.
4. *Cryptograptus marcidus* Hall (sp.)
5. *Glossograptus spinulosus* Hall (sp.)
6. *Young graptolite*.

This is clearly a fraction of the Norman's Kill assemblage of species.

No. 1 is represented by a single specimen, incomplete but distinct and showing well the 'peculiar proximal bar.' It was taken from an extensive ledge that lies along the south bank of the Wassatquoik, about a mile above the junction of that stream with the east branch of the Penobscot. Thin layers of graptolite-holding shale are separated by considerable thicknesses of highly siliceous slate that varies in color from olive-gray to deep blue-black.

The specimens of No. 2 are too obscure for certain recognition even of the genus. The hydrothecæ are undistinguishable. The branches have the double curvature that in different degrees is shown in several species of *Dicellograptus*, but they do not include an angle agreeing exactly with that assigned to any of the described species.

The best specimen of *Diplograptus* yet obtained was found in 1881 north of the stream, in a free, angular piece of shale, and was then mentioned as *D. pristis*. It differs in some particulars from *D. pristis* His., as described by Tullberg.†

The free portion of the outer margin of its hydrothecæ is unusually long, equalling three-quarters of the width of the polypary, ($1\frac{3}{5}$ mm : $2\frac{2}{5}$ mm). The specimen has fewer hydrothecæ in a given length of polypary than any described species,‡

* This Journal, Dec., 1881, vol. xxii, p. 434.

† Bihang till Kongl. Svenska Vetenskaps-Akademiens Handlingar, Bd. vi, No. 13, pp. 10, 11, taf. 1.

‡ *D. peosta* excepted, if necessary; description of which I have not been able to consult. For the name, see Wisconsin Geological Report 1862, p. 430.

only sixteen in an inch, six in ten millimeters. *D. longissimus* Kurek * (Upper Silurian) has seven hydrothecæ in ten millimeters; they overlap each other more than do those in the Maine specimen, and terminate differently. *D. foliaceus* Murch., † has eighteen to thirty in an inch, and is wider. *D. euglyphus* Lapw., ‡ for which a different marginal angle of the hydrothecæ is stated, has eighteen to twenty-four. *D. rugosus* Emmons § has twenty and a wider polypary. *D. pristis* has nine or ten in ten millimeters and has a small radicle. || The Maine specimen agrees nearly with *D. pristis* and *D. longissimus* in the angle between the outer margin of the hydrothecæ and the central line of the polypary. It has a radicle two millimeters long.

The precise level at which this probably new species occurs relatively to the other specimens has not yet been ascertained.

4. *Graptolithus marcidus* Hall, has been treated as identical with *Cryptograptus tricornis* Carr. (sp.). Prof. Hall's figure shows no essential difference. *C. tricornis* has parallel lateral margins. In all distinct and entire specimens, from fifteen to forty millimeters long, that I have seen, from Hudson River valley localities, there is well marked distal convergence of the margins. The convergence sometimes begins or becomes more rapid at a point distant perhaps six times the maximum width of the polypary from its proximal extremity, that is about one-half or one-third of its length, and thus is seldom conspicuous in the proximal half of the polypary. A slight proximal convergence also is frequently or usually noticeable. Prof. Hall's figure may represent a specimen which had lost part of its polypary. The few parallel-margined New York specimens that I have seen are small (with pointed distal extremity ¶) or imperfect.

I think *C. marcidus* should be retained for the present.

The Maine specimen is from the same piece of shale with the *Diplograptus* above mentioned (No. 3.) The slowness of the test characteristic in *Cryptograptus* makes the specimen inconspicuous, but it is easily recognizable after the attention is directed to it.

5. The specimens of *Glossograptus* were obtained from the same ledge as No. 1, but from a higher layer of shale. They are very indistinct. The spines appear to be in number about ten on each side. The polypary, exclusive of the spines, is

* Geol. För. i Stockholm Förh., Bd. vi, Heft 7, p. 302, taf. 14, figs. 8, 9.

† Sil. Syst., Pl. xxvi, f. 3. Hopkinson and Lapworth in Quart. Journ. Geol. Soc. Lond. 1874, xxxi, p. 657.

‡ Ann. and Mag. Nat. Hist., (5) v, p. 166.

§ American Geologist p. 105, Pl. 1, fig. 26.

|| Tullberg, op. cit., p. 10.

¶ Like fig. 17, Plate B, of Graptolites of the Quebec Group.

sixteen millimeters long and three or three and one-half wide. The spines are three millimeters long, directed somewhat distally and a little reflexed. So far as the specimens can be made out, they agree well with Prof. Lapworth's figure of the ventral aspect of *G. Hincksii* Hopk. (sp.).* The species of this genus require revision, but its American representatives are not yet fully known.

At the localities near Albany, beside a very abundant *Glossograptus* which is perhaps a small form of *G. ciliatus* Emmons, there is an oddly irregular shaped form, that in some respects approaches *G. pinguis* Hopk. (sp.).† Figure 16 of Plate B, Graptolites of the Quebec Group, seems to represent this peculiar graptolite in a spineless condition and small.

No. 6 somewhat resembles Mr. Carruthers' figure of the young form of *Cryptograptus tricornis* Carr (sp.),‡ but is a little longer in proportion to its width, and the sides do not diverge quite so rapidly. I have no opinion to express as to its relations.

The Graptolite compared in 1881 to *Dicranograptus ramosus* probably can not be identified. There is no *Phyllograptus* among my specimens.

Cambridge, Mass.