

ART. XXII.—Fauna of the "Upper Taconic" of Emmons, in Washington County, N. Y. With Plate I. By CHARLES D. WALCOTT.

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IN his second memoir on the "Taconic System,"* Dr. Emmons described two species of trilobites from the black Taconic slate near Bald Mountain, Washington County, N. Y.; *Atops trilineatus* and *Elliptocephala asaphoides*. Subsequently the black slate was referred to the upper division of the Taconic and with it the contained fossils. It is the fauna of which these two species form a part that is embraced within the title of this paper.

From the time of the original discovery and description of the fossils by Dr. Emmons, up to the present, no discovery of Cambrian or First Fauna fossils has been reported from Washington County, except in 1886, when the discovery of Cambrian fossils at Granville was made known.†

At an horizon in Georgia, Vermont, equivalent to that of the "Upper Taconic" series, fossils were found by Noah Parker, Esq., and given to Rev. Z. Thompson, who sent them to Professor Hall who, in 1859, described and referred them to the Hudson River shales (Twelfth Ann. Rep. State Cab. Nat. Hist., 1859). Subsequently, this reference was changed to the Quebec group (Thirteenth Rep., *idem*, 1860), by Professor Hall, and in 1861 (Geol. Surv. Canada; New Species Lower Silurian Fossils, by E. Billings, p. 1, 1861), they were referred to the "Potsdam Group (Primordial Zone)," by Mr. E. Billings. Subsequently Mr. S. W. Ford discovered an equivalent fauna in the vicinity of Troy, N. Y., and concurred with Mr. Billings in referring it to the Lower Potsdam (this Journal III, vol. ii, p. 34, 1871). Afterwards Mr. Ford discovered that the fauna extended farther south and into Columbia County, N. Y.

In the introduction to Bulletin 30, of the U. S. Geological Survey, I have given a summary of our knowledge of this fauna (Taconic or Middle Cambrian) as known to date of publication (1886), and to that I will now add the results of my study of the fauna of the typical "Upper Taconic" area and section in Washington County, N. Y.

* Pamphlet, 1844, reprinted in Agric. N. Y., vol. i. pp. 64, 65, 1876.

† Proc. Amer. Assoc. Adv. Sci., advance sheet, December, 1886; Cambrian Age of the Roofing Slate of Granville, Washington County, N. Y.; Charles D. Walcott.

‡ In a paper read by the writer before the National Academy of Sciences, April 22, 1887, the name Taconic is restricted to the Middle Division of the Cambrian. This paper, with map and sections, will be published within a short time.

Thirty-five species and one variety were found in the even-bedded and conglomerate limestones and the associated slaty argillaceous and siliceous shales. Of these eleven species and one variety were unknown before and are described in this paper. The geographic distribution of the others is given in Bulletin 30, with the exception of their occurrence in Washington County.

The following is a list of the species now in the collections of the U. S. Geological Survey, from Washington County :

<i>Protospongia</i> (loose spiculae).	<i>Hyalithellus micans</i> var. <i>rugosa</i> , n. var.
<i>Elhmophyllum</i> (fragment).	<i>Stenothecca elongata</i> Walcott.
<i>Lingulella cœlata</i> Hall (sp.).	<i>Stenothecca rugosa</i> Hall (sp.).
<i>Lingulella Granvillensis</i> , n. sp.	<i>Aristozoe rotundata</i> , n. sp.
<i>Lingulella</i> , sp. undet.	<i>Aristozoe Troyensis</i> Ford.
<i>Linnarssonia Taconica</i> , n. sp.	<i>Leperditia</i> (I) <i>dermatoides</i> , n. sp.
<i>Kutorgina pannula</i> White (sp.).	<i>Microdiscus connexus</i> , n. sp.
<i>Obolella</i> , sp. undet.	<i>Microdiscus lobatus</i> Hall (sp.).
<i>Orthis</i> , sp. undet.	<i>Microdiscus speciosus</i> Ford.
<i>Orthis Salemensis</i> , n. sp.	<i>Olenellus asaphoides</i> Emmons.
<i>Camarella</i> , sp. ?	<i>Olenoides Fordi</i> , n. sp.
<i>Fordilla Troyensis</i> Barrande.	<i>Solenopleura</i> (?) <i>Nana</i> Ford.
<i>Modiolopsis</i> (??) <i>prisca</i> , n. sp.	<i>Solenopleura</i> (?) <i>tumida</i> , n. sp.
<i>Platyceras primævum</i> Billings.	<i>Conocoryphe trilineata</i> Emmons.
<i>Hyalithes Americanus</i> Billings.	<i>Ptychoparia</i> , like <i>P. Adamsi</i> .
<i>Hyalithes communis</i> Billings.	<i>Ptychoparia</i> (?) <i>Fitchi</i> , n. sp.
<i>Hyalithes impar</i> Ford.	<i>Ptychoparia</i> , sp. undet.
<i>Hyalithellus micans</i> Billings.	<i>Ptychoparia</i> (?) <i>clavata</i> , n. sp.

Of the above, *Lingulella Granvillensis*, *Linnarssonia Taconica*, *Microdiscus connexus* and *Conocoryphe trilineata* are types related more closely to the Lower Cambrian than to the Middle Cambrian fauna. Stratigraphically, they occur low down in the section, and I shall not be surprised if other representative species and some species identical with those from the Lower Cambrian of St. John, N. B., or Newfoundland, are found at about the same horizon.

I have discussed the distribution of the Middle Cambrian or Taconic fauna in Bulletin 30, and the reader is referred to that report for further information.

In a report on the Geology of Washington County, now in the course of preparation, a geologic map will show the distribution of the formations and the localities of the fossils and the vertical range of the latter will be given in the sections.

LINGULELLA GRANVILLENIS, n. sp.

Plate I, figs. 15-15c.

Shell small, elongate ovate, margins sub-parallel for a short distance at the widest portion about midway of the shell, broadly rounded in front, ventral valve attenuate toward the beak; dorsal valve ovate and rounded at the beak. General

surface depressed convex. Surface marked by fine concentric lines and more rarely, fine radiating lines.

The cast of the interior of the ventral valve shows four narrow elongate scars, radiating from the beak toward the front margin.

A cast of the interior of a dorsal valve shows fine vascular markings and a well-marked median groove, also faint impressions of the anterior adductor muscular scars and, also, what may have been the adjustor muscular scars.

This species is the representative, in the Middle Cambrian of *Lingulella Dawsoni* (Bull. 10, U. S. Geol. Survey, p. 15, 1884), of the St. John formation of the Lower Cambrian. It may also be compared with *Lingulella ferruginea*, which ranges from the Harlech beds through the Menevian and probably into the period of the Lingula flags (Brit. Foss. Brach., vol. iii, p. 337). Dr. G. Linnarsson figures a closely related species from the Paradoxides beds of Sweden (Brach. Par. Beds of Sweden, pl. III, figs. 24-28).

Formation and Localities.—Cambrian. Limestones interbedded in the Taconic shaly slates; two miles south of North Granville; by the roadside a little west of the bridge crossing the Poultney River at Low Hampton; and on the roadside north of school house No. 4, in the northeast part of Whitehall, Washington County, N. Y.

LINNARSSONIA TACONICA, n. sp.

Plate I, figs. 18-18d.

Shell small, rarely exceeding 3^{mm} in length or breadth, usually circular to transversely broad oval. Ventral valve moderately convex; apex excentric; dorsal valve depressed convex; beak obtusely pointed, marginal; surface of the valves marked by fine lines of growth.

In the interior of the ventral valve, near the posterior margin, oblique scars occur, one on each side of the raised rim surrounding the foraminal opening in allied species. From a point of the foraminal rim a narrow depression extends obliquely outward and forward, on each side, so as to enclose a ^ shaped elevation, that is strongly marked in casts of the interior of the valve. The interior of the dorsal valve shows two large oval scars, near the posterior margin, separated by a low ridge that extends over three-fourths of the distance to the front margin.

This species is related to both *L. transversa* and *L. sagittalis*.* It differs chiefly in the characters of the interior of the dorsal valves. As yet none of the specimens have shown the ventral

* This Journal, III, vol. ix, pp. 114-117.

valve to be perforate, this is owing probably to the minute size of the opening and the imperfection of the specimens which have been examined.

This is the first instance known to me of the occurrence of this genus in association with the Taconic or Middle Cambrian faunas, as it is essentially a Lower Cambrian type both in New Brunswick, Newfoundland, and Sweden and Wales.

Formation and localities.—Cambrian. Limestones, interbedded in the shaly Taconic slates, at Rock Hill school house (No. 8), near North Greenwich; $1\frac{1}{2}$ miles east of North Greenwich; lowest fossiliferous horizon on D. W. Reid's farm, $1\frac{1}{2}$ miles west of North Greenwich; west summit of Bald Mountain, in the town of Greenwich; two miles south of North Granville; on the roadside just west of Low Hampton crossing of the Poultney River; and one mile south of Shushan, all in Washington County, N. Y.

KUTORGINA PANNULA White, (sp.).

Plate I, figs. 14–14b.

Kutorgina pannula.—See Bull. 30, U. S. Geol. Survey, p. 105, 1886.

The specimens of this species, from Washington County, are hardly distinguishable from those obtained on the slopes of the Highland range in southern-central Nevada. In Nevada, the species occurs at the lowest known fossiliferous horizon and ranges up through 1400 feet of strata, but not into the Upper Cambrian or Potsdam horizon.

The edges of the reticulations on the surface of the New York specimens are usually sharper than those of the Nevada form, but I do not think that the difference is of specific importance.

Its occurrence, in Washington County, in the lower beds of the Taconic formation, is of great interest, as it adds another connecting link between the widely separated localities of this fauna in Nevada and New York.

Formation and localities.—Cambrian. Limestones, interbedded in the shaly Taconic slates, on the roadside, just west of Low Hampton crossing of the Poultney river and two miles south of North Granville, Washington County, N. Y.

ORTHIS SALEMENSIS, n. sp.

Plate I, figs. 17–17a.

Shell about the average size of the Cambrian species of the genus. Transversely subquadrilateral; front broadly rounded and slightly sinuate midway: hinge line as long as the greatest width of the shell.

Ventral valve convex, most elevated about one-fourth the distance from the beak to the anterior margin; beak small and incurved to the margin of the medium sized area; the surface of the area and the foramen have not been observed; mesial sinus broad and shallow, it is marked by a low median rib and, laterally, by two costæ on each side, a third appearing just outside the sinus.

The dorsal valve, associated in the same hand specimen of limestone, is slightly more convex; frontal margin with a rather deep sinuosity to receive the projection of the ventral valve; median fold broad and but slightly elevated, marked by two or three low costæ; the beak appears in the broken specimen in the collection to be scarcely elevated above the surface of the shell, and to terminate at the cardinal margin; area unknown.

The surface of both valves is marked by fine concentric lines of growth, and low, rounded costæ, varying in number from six to seven, as in the specimens figured, to twelve or fourteen in other specimens.

In the broad costæ and the general aspect of the shell this species is unlike any known to me from the Cambrian.

Formation and localities.—Cambrian. Limestones, interbedded in the shaly Taconic slates, one and one-half miles south of Salem; one mile south of Shushan, and near Rock Hill school-house (No. 8), Greenwich, Washington County, N. Y.

HYOLITHELLUS MICANS var. RUGOSA, n. var.

Plate I, fig. 10.

This name is proposed for a variety of *Hyolithellus micans* that has well-marked concentric ridges with longitudinal striæ between them. The substance of the shell appears to be similar to that of *H. micans*. (See Bull. 30, U. S. Geol. Survey, p. 142.)

Formation and localities.—Cambrian. Limestones, interbedded in the shaly Taconic slates on the roadside just west of Low Hampton crossing of the Poultney river; lowest fossiliferous horizon on D. W. Reid's farm, and on hill back of Reid's farmhouse, one and one-half miles west of North Greenwich; two miles south of North Granville; and in the north part of Easton, about one mile south of the village of Greenwich, Washington County, N. Y.

MODIOLOPSIS ?? PRISCA, n. sp.

Plate I, fig. 19.

The only specimen of the species known to me is the cast of a right (?) valve, 2^{mm} in length. It is transversely oval in out-

line and rather strongly convex; the beak is subcentral and curves toward the hinge line, but does not reach it; an oval muscular scar is situated just within the pallial line, at the supposed anterior end; pallial line simple, continuous as far as observed.

The minute size and the fact that we have only the cast of the interior of the valve, render it very difficult to determine the correct generic relations of this shell. The nearly central position of the beak distinguishes it from all known species of *Modiolopsis*; while the muscular scar and pallial line, with the oval form, relates it to *Modiolopsis curta* of the Hudson River formation. The discovery of the character of the hinge line may place it in a genus of the *Arcadæ*; but, at present, I do not wish to state more than that I think it is undoubtedly a lamellibranchiate shell. With the possible exception of *Fordilla Troyensis*, which, possibly, may be the shell of some *Estheria*-like crustacean, I know of no true lamellibranchiate shell in the Cambrian system of America, as defined in 1886. (This Journal, vol. xxxiii, p. 147, 1886.)

Formation and locality.—Cambrian. Limestone, interbedded in shaly Taconic slate, on the roadside north of School-house No. 4, in the northeast part of Whitehall, Washington County, N. Y.

LEPERDITIA (I) DERMATOIDES, n. sp.

Plate I, figs. 13, 13a.

Outline of the valves, elongate, suboval, with the extremities of the hinge line rounded, subangular; moderately convex, sloping more rapidly to the ventral than the dorsal margin; in many specimens, however, it is difficult to determine the ventral from the dorsal margin, owing to their almost equal curvature and similar rounding of the ends; the hinge line is arched and but slightly marked. It is difficult to determine the anterior and posterior ends of the valves in many of the specimens, but in others the narrower end is considered as the anterior, and a small, round depression on the inner side of the valve places the muscular scar well toward the posterior end. The scar is barely visible on the outer surface.

The test is finely punctate, and so thin that it wrinkled in some instances like a membrane or skin.

Length of undistorted specimen, 6^{mm}; greatest height, 3.5^{mm}.

The strongly punctate surface is so unlike that of all the species referred to *Leperditia* that it may be that this species should be referred to a distinct genus.

In its punctate surface and general form it is unlike any other species known to me.

Formation and localities.—Cambrian. Limestones, interbedded in the shaly Taconic slate; north part of Easton, about one mile south of the village of Greenwich; on the west side of D. W. Reid's farm and on the summit of the hill, northwest of his farmhouse, about one and one-half miles west of North Greenwich; about three miles northeast and one and one-half miles east of North Greenwich; near Rock Hill school-house (No. 8), east of North Greenwich; and one mile S.S.E. of Battenville, in the town of Jackson, Washington County, N. Y.

ARISTOZOE TROYENSIS Ford.

Plate I, fig. 8.

Leperditia Troyensis Ford, 1873. This Journal, III, vol. vi, p. 138; Walcott, 1886, Bull. 30, U. S. Geol. Survey, p. 146.

The discovery of another specimen of this species enables me to refer it to the genus *Aristozoe* of Barrande. The thin test, grooved and reflected ventral margin, anterior tubercle and general form, all serve to connect it with that genus. In Bull. 30, U. S. Geol. Survey, a figure is given of the right valve, and I am now able to figure the left valve. The tubercle on the anterior end is elevated and directed forward.

Formation and localities.—Cambrian. Limestones, interbedded in the shaly Taconic slates, on the ridge east of the city of Troy, N. Y.; also at the lowest fossiliferous horizon, on the west side of D. W. Reid's farm, about one and one-half miles west of North Greenwich, Washington County, N. Y.

ARISTOZOE ROTUNDATA, n. sp.

Plate I, fig. 9.

General outline of the valves subrotund, with the exception of the nearly straight hinge line; anterior end slightly narrower than the posterior; general surface rather strongly convex, marked all around, except along the hinge line, by a strong marginal groove within a rounded marginal rim; a single elongate protuberance extends from the main body of the shell upward, just within the anterior marginal groove and the hinge line, where it is most prominent, and separated from the main body of the valve by a broad sulcus extending from the hinge line down on the valve over two-fifths the distance to the ventral margin.

The shell is thin and apparently very finely granulose.

A comparison with the types of the genus *Aristozoe* shows this species to be congeneric with them and specifically distinct from any described species of the genus. *Aristozoe*

*bisulcata** has a similar outline, but the tubercle is unlike that of *A. rotundata* and it is differently situated on the valves.

It is distinguished from *A. Troyensis* by its form and also the elongate tubercle or ridge.

The discovery of this species and the generic identification of *A. Troyensis* adds another Silurian genus to the Cambrian fauna and extends its range from the true Silurian down to the middle Cambrian. As yet I do not know of the presence of the genus in the Lower Silurian (Ordovician) rocks.

Formation and locality.—Cambrian. Limestones, interbedded in the shaly Taconic slates on M. C. Tefft's farm, about two miles southeast of North Granville, Washington County, N. Y.

MICRODISCUS CONNEXUS, n. sp.

Plate I, figs. 4, 4b.

Head semicircular, convex; bordered by a well-defined rim that is crenulated across the front and narrowed posteriorly toward the glabella where it terminates; cheeks most prominent at the postero-lateral portion, from whence they slope to the deep dorsal furrow about the glabella; the glabella and its backward spinose extension form, together, a fusiform median lobe, as there is no occipital furrow or ring, and the glabella and the spine are continuous. The glabella approaches the frontal margin more closely in some specimens than in others. The surface of both the head and pygidium appears smooth under a strong magnifying glass.

A glance at the head of this species recalls *Microdiscus punctatus*, *M. punctatus* var. *Pulchellus* and *M. Dawsoni* of the Lower Cambrian. It has the frontal rim and form of *M. Dawsoni*, but it is a smooth, not granulose species; and the associated pygidium is unlike that of *M. Dawsoni*. To *M. punctatus* it is related by its general form, but differs in the more coarsely crenulated margin, the form of the cheeks and its smooth surface, also in the characters of the associated pygidium. The presence of this type of the genus *Microdiscus* in association with well-known Middle Cambrian or Taconic fossils is another link between the Lower Cambrian fauna of New Brunswick and the Middle Cambrian fauna. It is the first instance known to me of the occurrence of a species with the long nuchal spine above the Paradoxides horizon in America.

Formation and localities.—Cambrian. Limestones, interbedded in the shaly Taconic slates, on the roadside just west of Low Hampton crossing of the Poultney river, one mile west of North Hebron, and two miles south of North Granville, Washington County, N. Y.

* Barrande; Syst. Sil. Boh., vol. i, Supplement, p. 477, 1872.

OLENOIDES FORDI, n. sp.

Plate I, figs. 5-5b.

Head rather strongly convex, frontal margin rounded, moderately elevated and separated from the glabella by a groove of medium width and depth. Glabella prominent, subquadri-lateral, narrowing very slightly towards the broadly rounded front; three pairs of short, obscure furrows occur well down toward the dorsal furrow surrounding the glabella; occipital ring well defined and bearing a spine that projects upward and backward. Fixed cheeks about one-half the width of the glabella and curving slightly downward from the glabella to the palpebral lobe; ocular ridge strong and extending to and connecting with the rim of the palpebral lobe; eye situated midway of the facial suture and rather prominent in size and position; postero-lateral limbs short, broad and deeply grooved by the furrow within the posterior margin; at a point midway of the latter, a broad angle is formed and a rudimentary spine indicated.

The direction of the facial suture is well shown in the figure of the head on the plate. A free cheek, associated in the same hand specimen of rock, shows a low visual surface for the eye, a marginal rim similar to that between the facial sutures, and a short spine at the postero-lateral angle.

The associated pygidium is moderately convex, and bears a narrow, convex, median lobe, divided into five transverse segments and a short terminal segment; the lateral lobes are marked by four coalesced segments, indicating the continuation of the anterior segments of the median lobe; although broken by the smooth border, the segments may be traced into the four anterior of the six spines of the outer margin. Surface granulose under a strong magnifier.

A comparison with *Olenoides quadriceps* and *O. Wasatchensis* (Bull. 30, U. S. Geol. Survey) shows a marked resemblance in the pygidia, but, in the head certain differences occur, such as the narrower glabella and the wider furrow between the glabella and frontal rim of *O. Fordi*.

The species referred to this genus from the American Cambrian strata are: *O. Nevadensis* (the type), *O. Marcoui*, *O. quadriceps*, *O. Wasatchensis* and *O. Fordi*. In Bulletin 30, U. S. Geol. Survey, I referred *O. typicalis*, *O. flagricaudus*, *O. levis* and *O. spinosus* to *Olenoides*, but since obtaining a nearly perfect specimen of *Olenoides*, closely related to the type species, I am convinced that the last mentioned four species belong to an as yet undescribed genus. This genus will be characterized in a future paper.

O. Fordi occurs in the lowest horizon of the Taconic slaty series now known to me, and is associated with *Olenellus asaphoides*, *Microdiscus connexus*, *Linnarssonina Granvillensis*, etc.

The specific name is given in honor of Mr. S. W. Ford, who has done such excellent work at this horizon about Troy, and Schodack Landing, N. Y.

Formation and localities—Cambrian. Limestones interbedded in shaly Taconic slates, on the roadside just west of the Low Hampton crossing of the Poultney River, two miles south of North Granville, and one mile north of Middle Granville, Washington County, N. Y.

SOLENOPLEURA ?? TUMIDA, n. sp.

Plate I, figs. 2-2a.

This species differs from *Solenopleura* ? *Nana*, with which it is associated at several localities in having a more tumid glabella, narrower frontal lobe and in the absence of an ocular spine. Some specimens of *S.* ? *Nana* have almost as tumid a glabella, but, usually, it is less elevated.

The generic reference is provisional, as both *S.* ? *tumida* and *S.* ? *Nana* appear to belong to a genus distinct from the typical species of *Solenopleura*.

Formation and localities.—Cambrian. Limestones interbedded in the shaly Taconic slates near Rock Hill school house, (No. 8) east of North Greenwich; $1\frac{1}{2}$ miles east and 3 miles northeast of North Greenwich; on the west side of D. W. Reid's farm about $1\frac{1}{2}$ miles west of North Greenwich; $\frac{1}{2}$ mile east of South Hartford post office; in the village of East Hebron; on the roadside just west of Low Hampton crossing of the Poultney River and one mile south of Shushan, Washington County, N. Y.

SOLENOPLEURA ? NANA Ford.

Plate I, figs. 1-1d.

Solenopleura Nana Ford, 1878. Amer. Jour. Sci., III, vol. xv, p. 126; Walcott, 1886. Bull. 30, U. S. Geol. Survey, p. 214.

This species was not illustrated by Mr. Ford, and the specimens I had, when preparing Bulletin 30, U. S. Geol. Survey, were so poor that the illustrations then given were not satisfactory. Among the specimens in the collections from Washington County I find considerable variation in the convexity of the glabella and also in the granulose surface; and I suspect that with a large series of more perfect specimens there could be separated a variety if not a distinct species. The pygidium associated with *S.* ? *Nana* at Troy and also in Washington County, two miles south of North Hebron and one mile north of Middle Granville, has a spinose margin that recalls the pygidia of certain species of *Peltura* from the Swedish Cambrian.

CONOCORYPHE TRILINEATA Emmons (sp.)

Plate I, figs. 7-7b.

For synonymy see Bull. 30, U. S. Geol. Survey, p. 203.

When examining the collections at Williams College, in 1886, I found the specimen from which the figure of *Atops trilineatus*, in Emmons's American Geology, pl. i, fig. 16, was drawn, and, through the courtesy of Professor S. W. Clarke, I have had a more accurate drawing made of it than the published figure. A study of the specimen, in connection with heads and pygidia collected from the original locality, shows that the species should be referred to the genus *Conocoryphe*,* as restricted by Corda, although *C. trilineatus* differs from the type of the genus *C. Sulzeri* in having a smaller pygidium and seventeen instead of fourteen thoracic segments; differences, however, of a specific rather than generic importance. The slender free cheeks have not yet been identified.

On plate xxvii, Bull. 30, U. S. Geol. Survey, figs. 1a, 1b, there are figures drawn by Mr. Ford of the species as identified by him at Troy, N. Y. The pygidium is similar to that associated with *Solenopleura? Nana* at other localities, and the head may be that of this species, but it is uncertain, owing to the imperfection of the specimens.

Formation and localities.—Cambrian. In black, argillaceous, shaly Taconic slate on the roadside near the old Reynolds Inn, now D. W. Reid's farm buildings about one mile west of North Greenwich; also in the northern part of Easton, about one mile S.S.W. of the village of Greenwich, Washington County, N. Y.

PTYCHOPARIA FITCHI, n. sp.

Plate I, fig. 6.

This species is founded on a minute head that occurs in association with *Microdiscus connexus* and several other species of the lower horizon of the Taconic slate series. The elongate unfurrowed glabella, wide fixed cheeks and strongly granulose surface, all unite to give it a facies unknown in any other species with which I am acquainted.

Formation and locality.—Cambrian. In limestone, interbedded in the shaly Taconic slates, two miles south of North Granville, Washington County, N. Y.

* Mr. S. W. Ford states that this species has been shown to belong to the genus *Conocoryphe* (Amer. Jour. Sci., III. vol. xix. p. 152), but, up to the present time, I have not seen any proof of its true generic relations nor could it well be shown before more perfect specimens of the head were obtained than those illustrated by Emmons.

PTYCHOPARIA? (*Subgenus?*) CLAVATA, n. sp.

Plate 1, fig. 3.

This is a minute trilobite, whose true relations are unknown. With the exception of its clavate glabella, it is related to *Solenopleura?* *Nana* and *S.?* *tumida* by the course of the facial sutures, wide fixed cheeks and small eye lobes.

Formation and localities.—Cambrian. Limestones interbedded in the shaly Taconic slates, $1\frac{1}{4}$ miles south of North Granville; on the roadside a little north of school house No. 4, in the northeast part of Whitehall; on the roadside just west of the Low Hampton crossing of the Poultney River; and near Rock Hill school house (No. 8), about a mile east of North Greenwich, Washington County, N. Y.

DESCRIPTION OF PLATE I.

[The natural size of the specimens is indicated by the lines beside the figures.]

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