

SMITHSONIAN MISCELLANEOUS COLLECTIONS
VOLUME 95, NUMBER 22

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TO NOMENCLATURE OF CAMBRIAN
TRILOBITES

BY
CHARLES ELMER RESSER
Curator, Division of Invertebrate Paleontology,
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This is the third paper in a series dealing with nomenclatural changes necessary for Cambrian species.¹ As in the previous papers, only trilobites are included, the nontrilobitic species being reserved for separate printing. Also, the former plan of arrangement in alphabetical order according to genera is continued. As a rule, foreign species from regions where specialists are known to be at work have not been considered.

ALBERTELLA Walcott, 1908

Albertella cimon (Walcott)

Zacanthoides ? cimon WALCOTT (part), Smithsonian Misc. Coll., vol. 67, no. 2, p. 41, pl. 7, fig. 6, 1917 (fig. 6a an indeterminate fragment of *Kootenia*).

Middle Cambrian, Ptarmigan; (loc. 63b) Ptarmigan Peak, near Lake Louise, Alberta.

Holotype.—U.S.N.M. no. 63767.

ANTAGMUS Resser, 1936

Antagmus pia (Walcott)

Ptychoparia pia WALCOTT, Smithsonian Misc. Coll., vol. 67, no. 3, p. 93, pl. 12, fig. 8, 1917.

Lower Cambrian, Mount Whyte; (loc. 35f) Mount Stephen, near Field, and (loc. 35h) Mount Bosworth, British Columbia.

Holotype.—U.S.N.M. no. 64391.

Antagmus cuneas (Walcott)

Ptychoparia cuneas WALCOTT, Smithsonian Misc. Coll., vol. 67, no. 3, p. 87, pl. 11, fig. 4, 1917.

Occurrence same as preceding.

Holotype.—U.S.N.M. no. 64369.

¹Resser, Charles Elmer, Nomenclature of some Cambrian trilobites, Smithsonian Misc. Coll., vol. 93, no. 5, Feb. 14, 1935; Second contribution to nomenclature of Cambrian trilobites, idem, vol. 95, no. 4, April 1, 1936.

Antagmus cleon (Walcott)

Ptychoparia cleon WALCOTT, Smithsonian Misc. Coll., vol. 67, no. 3, p. 84, pl. 12, fig. 10, 1917.

The figured specimen is not fully characteristic of the genus, but an unillustrated, better preserved cranidium in the same lot is more typical.

Occurrence same as preceding.

Holotype.—U.S.N.M. no. 64393.

Antagmus skapta (Walcott)

Ptychoparia skapta WALCOTT, Smithsonian Misc. Coll., vol. 67, no. 3, p. 95, pl. 12, fig. 9, 1917.

Lower Cambrian, Mount Whyte; (loc. 62w) Gog Lake, Wonder Pass, Alberta.

Holotype.—U.S.N.M. no. 64392.

APHELASPIS Resser, 1935**Aphelaspis wyomingensis (Miller)**

Crepicephalus ? wyomingensis MILLER, Journ. Pal., vol. 10, no. 1, p. 29, pl. 8, figs. 9-12, 1936.

Upper Cambrian; Crow Creek, 3 miles north of Tipperary, Owl Creek Range, Wyoming.

Cotypes.—Columbia Univ. nos. 12601-3.

ARAPAHOIA Miller, 1936**Arapahoa ransomei (Stoyanow)**

Hesperaspis ransomei STOYANOW, Bull. Geol. Soc. Amer., vol. 47, no. 4, p. 468, pl. 1, figs. 6, 7, 1936.

Upper Cambrian, Abrigo; Whetstone Mountains, Arizona.

Cotypes.—Presumably Univ. Arizona.

Arapahoa butleri (Stoyanow)

Hesperaspis butleri STOYANOW, Bull. Geol. Soc. Amer., vol. 47, no. 4, p. 469, pl. 1, fig. 8, 1936.

Occurrence same as preceding.

Holotype.—Presumably Univ. Arizona.

ASAPHISCUS Meek, 1873**Asaphiscus spathus (Mason)**

Anomocarella ? spaiha MASON, Bull. South California Acad. Sci., vol. 34, pl. 2, p. 107, pl. 15, fig. 10, 1935.

Middle Cambrian, Cadiz; Marble Mountains, California.

Holotype.—Los Angeles Mus. no. A 2471-10.

BERKEIA, n. gen.

Diagnosis.—Small trilobites. Cranidium considerably arched. Glabella over two-thirds length of the cranidium, slightly tapered, rounded in front. Two pairs of glabellar furrows well impressed. Fixigenes convex, less than half the width of glabella. Brim about as wide as the fixigene, consists of convex preglabellar area and a narrower somewhat swollen rim.

Pygidium also convex, with the axis extending to rear margin, and with two well-marked furrows followed by faint ones.

Genotype.—*Agraulos convexus* var. *B.* Berkey.

Berkeia typica, n. sp.

Agraulos convexus var. *B.* BERKEY, Amer. Geol., vol. 21, p. 288, pl. 20, figs. 5, 6, 1898.

The generic description cites the features of the species.

Upper Cambrian, Ironton; (loc. 82b) Taylors Falls, Minnesota.

Holotypes.—Columbia Univ. no. 22285.

BLOUNTIA Walcott, 1916**Blountia glabra** (Walcott)

Asaphiscus (Blainia) glabra WALCOTT, Smithsonian Misc. Coll., vol. 64, no. 5, p. 394, pl. 63, figs. 1-1e, 1916.

Upper Cambrian, Nolichucky; (loc. 107x) Bull Run Knobs, 11 miles northwest of Knoxville, Tennessee.

Cotypes.—U.S.N.M. nos. 62804-6.

BOLASPIDELLA, n. gen.

A small trilobite from the Middle Cambrian Wheeler shale fails to fit any existing genus. It is represented by only a few cranidia among the thousands of specimens collected from these beds. At first glance it is like *Bolaspis*, particularly like *B. errata* which has only a slight boss, but cannot be retained in the genus because the preglabellar area is wholly depressed.

Diagnosis.—Small trilobites with a roughly quadrangular cranidium. Glabella small, extending about two-thirds the length of the cranidium, arched. Glabellar furrows faint or lacking. Occipital ring heavy, extending into a stout spine. Fixigenes wider than glabella, rising from the dorsal furrow to the eyes. Eyes prominent, somewhat less than median in size. Eye lines rather heavy, straight. Brim rather wide, with a rolled rim and nearly flat preglabellar area.

Genotype.—*Ptychoparia housensis* Walcott.

***Bolaspidella housensis* (Walcott)**

Ptychoparia housensis WALCOTT, U. S. Geol. Surv. Bull. 30, p. 201, pl. 25, fig. 5, 1886.

Middle Cambrian, Wheeler; (loc. 4) Antelope Spring, House Range, Utah.

Holotype.—U.S.N.M. no. 15443.

BONNIELLA, n. gen.

Members of the long-ranging trilobite group to which *Bonnia*, *Kootenia*, *Olenoides*, and other genera belong are numerous in Lower and Middle Cambrian rocks. For example, *Bonnia*, wherever present, is usually represented by many species and thousands of individuals. A monographic study of this trilobite group has now gone far enough to warrant a few generalizations. In the first place few of the genera can be determined by cranidia alone, so that genera and even species must be made on pygidia, and the cranidia matched as nearly as possible by association, surface markings, or by proportionate dimensions. In the second place the genera grade one into the other, so that arbitrary lines of separation must be chosen, which for instance between *Bonnia* and *Kootenia* is the degree of fusion of pygidial pleural segments, and between *Kootenia* and *Olenoides*—both with pleural separations visible—is the unequal width of the two portions of the pleuron resulting from the diagonal course of the pleural furrow. A third generalization apparently warranted is that marginal or axial spines have nothing more than a specific value. Within a genus the marginal spines may vary from mere waviness of the margin near the anterior angles to a full suite of spines, sometimes longer than the pygidium. These and other modifications of the fundamental group characteristics tend to come and go with the passage of time.

Another modification not mentioned in the foregoing lines is the development of a flattened marginal extension instead of spines, which rather strangely seems to be accompanied by expansion of the anterior portion of the glabella. This tendency in the Lower Cambrian has given rise to the forms grouped under the new generic name *Bonniella*, and in late Middle Cambrian it has produced *Holteria*.

Bonniella is primarily characterized by the pygidial flange back of the second segment. Exclusive of this feature, the pygidium is typical of *Bonnia* in general appearance and in the presence of marginal spines at the anterior angles, but it has less complete pleural fusion than in the majority of species belonging to *Bonnia*. The cranidium, as in *Bonnia* and other members of the family, is quadrate. In

Bonniella the glabella is highly arched transversely with a steep anterior slope and has a tendency to expand forward. Two sets of short, reflexed glabellar furrows are generally clearly defined. In the three species now known the cranidium is granulose, but such markings are not observable on the pygidia.

Genotype.—*Olenoides (Dorypyge) desiderata* Walcott.

***Bonniella desiderata* (Walcott)**

Olenoides (Dorypyge) desiderata WALCOTT, U. S. Geol. Surv. 10th Ann. Rep., p. 644, text fig. 67, 1891.

Dorypyge desiderata MATTHEW, Trans. Roy. Soc. Canada, 2d ser., vol. 3, sec. 4, p. 187, 1897.

The glabella of this species is strongly granulose and evidently had an occipital spine. The pygidium of *B. desiderata* has broad marginal flanges which extend outward and backward at the posterior angles for a considerable distance. In keeping with this development the two marginal spines at the anterior angles are long and slender.

Lower Cambrian, Winooski; (loc. 26) 1½ miles southeast of Highgate Springs, Vermont.

Cotypes.—U.S.N.M. no. 18452.

BRISCOIA Walcott, 1924

***Briscoia nevadensis*, n. sp.**

Dicellosephalus osceola WALCOTT (not Hall), U. S. Geol. Surv. Mon. 8, p. 40, pl. 9, fig. 25, 1884.

This trilobite was referred to Hall's Wisconsin species of *Osceolia*, but it clearly belongs to *Briscoia*. *B. nevadensis* is smaller than most other species referred to the genus, and at the same time has a narrow glabella and slender pygidial axis.

Upper Cambrian, Hamburg; (loc. 66) north of the Dunderburg mine, Eureka District, Nevada.

Holotype.—U.S.N.M. no. 24659.

CEDARIA Walcott, 1924

***Cedaria milleri*, n. sp.**

Cedaria cf. *prolifera* MILLER, Journ. Pal., vol. 10, no. 1, p. 28, pl. 8, fig. 18, 1936.

The small Wyoming species has a less advanced direction for the posterior portion of the facial suture, and a narrower preglabellar area than *C. prolifera*.

Upper Cambrian, Du Noir; Warm Springs Creek, 2 miles west of Du Noir, Wind River Range, Wyoming.

Holotype.—Columbia Univ. no. 12632.

CONASPIS Hall, 1863

Conaspis HALL, 16th Ann. Rept. New York State Cab. Nat. Hist., p. 152, 1863.

Conaspis WALCOTT, Smithsonian Misc. Coll., vol. 57, no. 13, p. 357 (footnote), 1914.

Macrotoxus LORENZ (part), 1906, Zeitschr. Deutsch. Geol. Gesell., bd. 58, p. 61.

Hall stated, "Should the species possessing these features be found to require separation from *Conocephalites*, I would propose the name *Conaspis*." Thus was the genus *Conaspis* established, and no further study has been given it except the brief diagnosis in the footnote given by Walcott. However, both authors had a group of genera in mind, and hence their diagnoses are quite general.

As pointed out by Walcott, Lorenz referred two species to his genus *Macrotoxus*, one being *Anomocare angelini* Grönwall and the other *Conocephalites perseus* Hall. The latter was stated to be from the Mount Stephen fossil bed in British Columbia, hence it is not clear whether he was considering Hall's Upper Cambrian *C. perseus* and merely made an error in recording the locality or whether a Middle Cambrian trilobite from Canada was in mind. It is possible that Lorenz had knowledge of specimens of *Elrathina cordillerae* that Matthew had identified as *C. perseus*. Furthermore, *Anomocare angelini* does not even belong to the same trilobite family as *C. perseus* and will receive the name *Macrotoxus* if it should prove to be distinct from *Anomocare*; otherwise *Macrotoxus* becomes a synonym of *Anomocare* and not of *Conaspis* as stated by Walcott.

Walcott chose *Conocephalites perseus*, the species first on Hall's list as the genotype. Unfortunately, Hall's figure of *C. perseus* is inaccurately drawn and the type locality is lost owing to the discontinuance of the postoffice then known as Kickapoo, but as Hall's types are in the American Museum of Natural History, no questions as to the generic features remain.

Diagnosis.—Cephalon, excluding the posterolateral limbs, roughly rectangular. Eyes situated at about midlength, with the facial suture diverging slightly anterior to them, and intramarginal almost or altogether to the center. Posterior facial suture diverging rapidly, forming triangular posterolateral limbs. Dorsal furrows converge slightly and join across the front of the glabella in a rather straight line. Two or three pairs of glabellar furrows lightly impressed, the rear pair joining in the middle along a horizontal course. Palpebral lobes rather small and strongly bowed. Brim with a width about a third of the length of the cephalon. Rim defined by a sharp but shallow furrow, thickened, tapering laterally because of the intramarginal course of the suture.

Fixigenes convex, rather wide, with a rim defined by a shallow furrow. Genal spine sharp, sometimes as long as the cheek is wide, and is directed straight out in line with the margin.

Thoracic segments appear to have a strong furrow and considerable backward bend at the fulcrum. Tips sharp and long.

Pygidium short and transverse, tending to be triangular in outline. Axis elevated above rather flat pleural lobes. Three or more axial rings are well defined. Pleura fused, in some species sufficiently to eliminate the separating furrows. Most or possibly all species carry delicate marginal spines but in some species only the anterior segment is thus developed. Rear margin sometimes indented medianly.

Gnototype.—*Conocephalites perseus* Hall.

Conaspis perseus (Hall)

Conocephalites perseus HALL, 16th Ann. Rep. New York State Cab. Nat. Hist., p. 153, pl. 7, figs. 17-23; pl. 8, fig. 33, 1863.

Conaspis perseus HALL, idem, p. 152; WALCOTT, Smithsonian Misc. Coll., vol. 57, no. 13, p. 357 (footnote), 1914.

Upper Cambrian, Franconia; opposite the mouth of the Chippewa River, Minnesota. Kickapoo and many other localities, Wisconsin.

Cotypes.—A.M.N.H. no. 319.

COOSIA Walcott, 1913

Coosia onusta (Whitfield)

Crepicephalus onustus WHITFIELD, Ann. Rep. Wisconsin Geol. Surv., p. 53, 1878; Geol. Wisconsin, vol. 4, p. 182, pl. 1, figs. 22, 23, 1882.

Anomocarella onusta WALCOTT, Smithsonian Misc. Coll., vol. 64, no. 3, p. 204, 1916.

Upper Cambrian, Eau Claire (Cedaria zone); Eau Claire and other localities in Wisconsin.

Holotype.—Univ. Wisconsin.

Coosia connata (Walcott)

Ptychoparia connata WALCOTT, Proc. U. S. Nat. Mus., vol. 13, p. 272, pl. 21, fig. 2, 1890.

Upper Cambrian, Eau Claire (Crepicephalus zone); (loc. 78a) Eau Claire and other localities in Wisconsin.

Holotype.—U.S.N.M. no. 23855.

Coosia wyomingensis, n. sp.

Bathyriscus sp., WALCOTT, U. S. Geol. Surv. Mon. 32, p. 466, pl. 64, fig. 6, 1899.

The pygidium on which this species is based is rather blunt, but fully typical of the genus. Most of the surface is exfoliated and there-

fore shows pleural grooves and furrows much more strongly than on the exterior.

Upper Cambrian; Dead Indian Creek, Clark Fork, Wyoming.

Holotype.—U.S.N.M. no. 94343.

DAWSONIA Hartt, 1868

Dawsonia HARTT, in Dawson, *Acadian Geol.*, 2d ed., p. 655, 1868.

Goniodiscus RAYMOND, *Ottawa Nat.*, vol. 27, p. 101, 1913.

Calodiscus HOWELL, *Journ. Pal.*, vol. 9, no. 3, 224, 1935.

In the second edition of "Acadian Geology" published in 1868, Dawson, p. 641, quotes Hartt's preliminary report on the first Cambrian fossils discovered in maritime Canada, which appeared in Bailey's "Observations on the Geology of New Brunswick", 1865. On page 643 Dawson makes the following statement: "other engagements have prevented Mr. Hartt from fulfilling his intention of publishing detailed descriptions of the species. In compliance, however, with my desire to place these interesting forms before geologists in this work, he has kindly communicated to me his ms. notes; and I have extracted from these the following descriptions of several of the more common species." Then follows descriptions of 26 species, of which 12 are illustrated.

A figure and description of *Microdiscus dawsoni* appears on page 654. The first paragraph on the following page is written in the first person, but it is not clear whether it was Dawson writing or whether he was merely quoting Hartt. However, a note is appended by Dawson in the second paragraph which reads as follows: "Mr. Hartt had originally described this species under the new generic name of *Dawsonia*; but Mr. Billings regards it as a species of *Microdiscus* of Salter." From this statement it is evident that Hartt described this trilobite as *Dawsonia dawsoni* and that Dawson, without Hartt's direction referred the species to the invalid genus *Microdiscus* Emmons (not Salter). Consideration of these facts warrants the conclusion that *Dawsonia* is a valid genus for this and its related species. Subsequently, *Dawsonia* was used several times—by Carpenter and by Nicholson in 1873 and by Fritsch by 1879—but this does not invalidate its application to a trilobite by Hartt in 1868.

In 1913 Raymond reviewed this group of trilobites, proposing *Goniodiscus* for the species of *Dawsonia*. His argument that *Dawsonia* could not be restored because meanwhile it had been applied to another animal, is, of course, not well founded, for even if *Dawsonia* had been synonymous with *Microdiscus* when proposed in 1868 its further use in 1873 would not have been allowable.

Inasmuch as *Goniodiscus* proposed by Raymond in 1913 was previously used in 1842, Howell substituted *Calodiscus*.

Therefore, when the history of these generic names is reviewed *Dawsonia* appears to have been clearly established and subsequent changes were unnecessary.

Besides the genotype the following species seem to belong to *Dawsonia*:

- Goniodiscus lobata* (Hall)
- Calodiscus oclandicus* Westergaard
- Goniodiscus parkeri* (Walcott)
- Microdiscus sculptus* Hicks
- Calodiscus foveolatus* Howell

The family name would, according to the rules, become Dawsonidae, which would contain the genera *Dawsonia* Hartt, *Eodiscus* Matthew and *Weymouthia* Raymond.

Genotype.—*Dawsonia dawsoni* Hartt = *Microdiscus dawsoni* Billings.

DUNDERBERGIA Walcott, 1924

Dunderbergia anyta (Hall and Whitfield)

Crepicephalus (*Loganellus*) *anytus* HALL and WHITFIELD, U. S. Geol. Expl. 40th Par., vol. 4, p. 219, pl. 2, figs. 19-21, 1877.

Liostracus anytus BRÖGGER, Geol. Fören. Stockholm Förhandl., vol. 8, p. 212, 1886.

This form is not quite typical of the genus because it is narrow. Also, the surface is more heavily lined than usual.

Upper Cambrian, Secret Canyon; Schellbourne, Schellbourne Range, Nevada.

Lectotype and paratype.—U.S.N.M. no. 24576.

EHMANIA Resser, 1935

Ehmania tetonensis (Miller)

Marjumia ? *tetonensis* MILLER (part), Journ. Pal., vol. 10, no. 1, p. 33, pl. 8, figs. 19, 20, 1936 (not fig. 21 = *Kootenia tetonensis*).

Middle Cambrian, Wolsey; South Fork, Teton Creek Canyon, Teton Range, Wyoming.

Cotypes.—Columbia Univ. no. 12607.

Ehmania adina (Walcott)

Ptychoparia adina WALCOTT, Smithsonian Misc. Coll., vol. 67, no. 3, p. 78, pl. 12, figs. 3-3b, 1917.

Middle Cambrian, Stephen?; (loc. 57q) Mount Bosworth, British Columbia.

Cotypes.—U.S.N.M. nos. 64383-5.

EHMANIELLA, n. gen.

It seems necessary to make a genus for the forms which are about midway between *Ehmania* and *Elrathia*.

Compared to *Ehmania*, *Ehmaniella* is characterized by the greater width of the cranidium, heavier eye lines, vertical striae on the wider preglabellar area, and a pygidium with fewer segments. The glabella and fixigenes are apt to be granulose or lined. Comparing the new genus with *Elrathia*, the differences in the cranidium are only minor, except for greater width, but the pygidium of *Ehmaniella* is smaller and has the pleural divisions and furrows more clearly developed, extending to the margin with but little loss.

Genotype.—*Crephicephalus* (*Loganellus*) *quadrans* Hall and Whitfield.

Ehmaniella quadrans (Hall and Whitfield)

Crephicephalus ? (*Loganellus*) *quadrans* HALL and WHITFIELD, U. S. Geol. Expl. 40th Par., vol. 4, p. 238, pl. 2, figs. 11-13, 1877.

Ptychoparia quadrans WALCOTT, U. S. Geol. Surv. Bull. 30, p. 199, pl. 29, figs. 4-4b, 1886.

Middle Cambrian, Ophir; north of Brigham, Wasatch Range, and (loc. 31d) Blacksmith Fork Canyon, Bear River Range, Utah.

Holotype and paratype.—U.S.N.M. no. 15432.

ELRATHIA Walcott, 1924**Elrathia occidentalis (Walcott)**

Ptychoparia occidentalis WALCOTT, U. S. Geol. Surv. Mon. 8, p. 51, pl. 10, fig. 5, 1884.

Middle Cambrian, Eldorado; (loc. 55a) east slope Prospect Mountain, Eureka District, Nevada.

Holotype.—U.S.N.M. no. 24612.

Elrathia palliseri (Walcott)

Ptychoparia palliseri WALCOTT, Canadian Alpine Journ., vol. 1, pt. 2, p. 244, pl. 3, fig. 6, 1908.

Middle Cambrian, Stephen; (loc. 14s) Mount Stephen, above Field, British Columbia.

Holotype.—U.S.N.M. no. 94344.

Elrathia permulta (Walcott)

Ptychoparia permulta WALCOTT (part), Smithsonian Misc. Coll., vol. 67, no. 4, p. 145, pl. 21, fig. 1, 1918 (fig. 2 = *E. dubia*).

Middle Cambrian, Burgess; (loc. 35k) Burgess, near Field, British Columbia.

Holotype.—U.S.N.M. no. 65516.

Elrathia dubia, n. sp.

Ptychoparia permulta WALCOTT (part), Smithsonian Misc. Coll., vol. 67, no. 4, p. 145, pl. 21, fig. 2, 1918.

This specimen departs in several respects from the typical forms of the genus, even though some features relate it to *E. permulta*. The new species lacks eye lines and is narrower between the eyes. The surface is granulated instead of being striated, and the granules behind the eye-line position both on the glabella and the fixigenes are heavier than they are anterior to that position.

Undescribed species have combinations of the surface markings of *E. permulta* and *E. dubia*, which is a strong reason for retaining the latter in the genus.

Occurrence same as preceding.

Holotype.—U.S.N.M. no. 65517.

ELRATHINA, n. gen.

A group of species considerably like *Elrathia* at first glance presents uniformly different characteristics, so that another genus must be recognized. In general the trilobites of both groups are similar, particularly in appearance. *Elrathina* has a smaller pygidium which further differs in structure. No great difference is apparent in the cranidium, except the narrower preglabellar area. The thorax, owing to more numerous segments and the necessity of tapering to a smaller tail, becomes more triangular in shape and therefore looks somewhat different.

Genotype.—*Conocephalites cordillerae* Rominger.

Elrathina cordillerae (Rominger)

Conocephalites cordillerae ROMINGER, Proc. Acad. Nat. Sci. Philadelphia, p. 17, pl. 1, fig. 7, 1887.

Ptychoparia cordillerae WALCOTT, Amer. Journ. Sci., 3d ser., vol. 36, p. 165, 1888; Smithsonian Misc. Coll., vol. 67, no. 4, p. 144, pl. 21, figs. 4 (3 and 5?), 1918.

Middle Cambrian, Stephen; (loc. 145) Mount Stephen, above Field, British Columbia.

Holotype.—Acad. Nat. Sci. Philadelphia; cast, U.S.N.M. no. 17831; plesiotypes, nos. 65518, 57658.

ELVINIA Walcott, 1924**Elvinia unisulcata** (Hall and Whitfield)

Crepicephalus (Loganellus) unisulcatus HALL and WHITFIELD, U. S. Geol. Expl. Par., vol. 4, p. 216, pl. 2, figs. 22, 23, 1877.

Ptychoparia unisulcatus WALCOTT, U. S. Geol. Surv. Mon. 8, p. 58, 1884.

Upper Cambrian, Secret Canyon; (loc. 61) south of the Hamburg Mine, Eureka District, Nevada.

Cotypes.—U.S.N.M. no. 24574.

***Elvinia tetonensis*, n. sp.**

Elvinia roemeri MILLER, Journ. Pal., vol. 10, no. 1, p. 30, pl. 8, fig. 36, 1936.

Compared with *E. roemeri*, this species has a much shorter brim, which gives the whole cranidium a wider appearance.

Upper Cambrian, Dry Creek; South Fork Teton Canyon Creek, Teton Range, Wyoming.

Holotype.—Columbia Univ. no. 12631.

GLAPHYRASPIS, n. gen.

Diagnosis.—Small trilobite. Glabella rather large, nearly rectangular in outline, well defined by dorsal furrow. Four pairs of short, faint, glabellar furrows. Occipital furrow shallow. Short median, longitudinal furrow in front of glabella. Fixigenes arched, tapering in width from brim to posterior margin. Brim turned downward; rim half or less than half the width of the preglabellar area; anterior furrow shallow. Eyes small, situated well forward. Delicate eye lines have a horizontal direction.

Name.—*γλαφυρος* = neat; *ασπίς* = shield.

Genotype.—*Liostracus parvus* Walcott.

***Glaphyraspis parva* (Walcott)**

Liostracus parvus WALCOTT, U. S. Geol. Surv. Mon. 32, pt. 2, p. 463, pl. 65, fig. 6, 1899.

Upper Cambrian, Dry Creek; (loc. 151f) southeast of Pebble Creek, Yellowstone National Park, Wyoming.

Holotype.—U.S.N.M. no. 35233.

GLYPHASPIS Resser, 1935

***Glyphaspis nevadensis*, n. sp.**

Ptychoparia piochensis WALCOTT (part), U. S. Geol. Surv. Bull. 30, p. 201, pl. 26, fig. 2 (only), 1886.

Ptychoparia kempi PACK, Journ. Geol., vol. 14, p. 298, pl. 3, fig. 1, 1906.

As stated in 1935, this cranidium clearly belongs to *Glyphaspis*. If Pack's figure in this instance should be more correctly drawn than his other figures, its reference to this species would be untenable.

Middle Cambrian, Chisholm; (loc. 31) southwest slope of the Highland Range, 3 miles northwest of Pioche and Half Moon Mine, Pioche, Nevada.

Holotype.—U.S.N.M. no. 94346.

Glyphaspis tetonensis, n. sp.

Glyphaspis cf. perconcava MILLER, Journ. Pal., vol. 10, no. 1, p. 30, pl. 8, fig. 17, 1936.

G. perconcava Poulsen probably does not belong to the genus, but the Wyoming form does. Compared with the genotype, *G. capella*, the new species has a relatively wider and longer axis, and the pleural grooves run closer to the margin.

Middle Cambrian; South Fork, Teton Canyon Creek, Teton Range, Wyoming.

Holotype.—Columbia Univ. no. 12609.

HAMPTONELLA, n. gen.

Diagnosis.—Minute trilobite. Cranidium nearly quadrate. Glabella unfurrowed, long, rectangular, and narrow. Brim confined to a rim. Fixed cheeks rather wide. Eyes small, situated about the middle of the head.

Genotype.—*Ptychoparia fitchi* Walcott.

Hamptonella fitchi (Walcott)

Ptychoparia ? fitchi WALCOTT, Amer. Journ. Sci., vol. 34, p. 197, pl. 1, fig. 6, 1887; 10th Ann. Rep. U. S. Geol. Surv., p. 650, pl. 96, fig. 5, 1891.

Lower Cambrian, Schodack; (loc. 34) 2½ miles south of North Granville, New York.

Holotype.—U.S.N.M. no. 17455.

HEBEDISCUS Whitehouse, 1936**Hebediscus cobboldi, n. sp.**

Ptychoparia ? attleborensis COBBOLD, Quart. Journ. Geol. Soc. London, vol. 66, p. 23, pl. 3, figs. 11-13, 1910.

Microdiscus helena COBBOLD (part), idem, pl. 3, figs. 15, 16, 1910; idem, vol. 67, p. 298, 1911; idem, vol. 76, p. 370, 1921.

Pagetia ? attleborensis COBBOLD, idem, vol. 87, p. 462, pl. 38, figs. 1-5, 6?, 1931.

It appears that the English specimens referred to the Massachusetts species *H. attleborensis* (Shaler and Foerste) are a distinct species. Evidently those from Newfoundland can be left with *H. attleborensis*, at least for the present.

H. cobboldi differs in having a narrower glabella with somewhat better defined furrows, and the declivity forward of the eye line and glabella is less abrupt.

Lower Cambrian, Olenellus limestone; Comley, Shropshire, England.

Cotypes.—Sedgwick Mus. no. A 8.

IDAHOIA Walcott, 1924

Idahoia explanata (Whitfield)

Conocephalites (Ptychaspis) explanatus WHITFIELD, Ann. Rep. for 1879, Wisconsin Geol. Surv., p. 49, 1880; Geol. Wisconsin, vol. 4, p. 181, pl. 1, figs. 27, 28, 1882.

Ptychoparia explanata MILLER, N. A. Geol. Pal., p. 565, 1889.

The specimens in the Museum collections identified by Whitfield are used for this generic reference.

Upper Cambrian, Franconia; (loc. 79) Hudson, Wisconsin.

Holotype.—Univ. Wisconsin; metatypes, U.S.N.M. no. 94372.

Idahoia wyomingensis, n. sp.

Ptychoparia (Lonchocephalus) wisconsinensis WALCOTT (part), U. S. Geol. Surv. Mon. 32, p. 461, pl. 64, figs. 1, 1a, 1899 (not 1b = *I. hamula*; 1c = an undetermined species from Wisconsin).

Walcott's illustrations represent three species, the cranidium and cheek from Soda Butte Creek, constituting the new species. The figure copied from Hall is not *I. wisconsinensis* as stated, but *I. hamula*, and the pygidium belongs to an undescribed species, possibly a *Ptychaspis*.

Compared with *I. wisconsinensis*, the new species is somewhat shorter and smaller in size.

Upper Cambrian, Dry Creek; (loc. 151e) Soda Butte Creek, Yellowstone National Park, Wyoming.

Cotypes.—U.S.N.M. no. 35225.

IDDINGSIA Walcott, 1924

Iddingsia affinis (Walcott)

Ptychoparia (Euloma?) affinis WALCOTT, U. S. Geol. Surv. Mon. 8, p. 54, pl. 10, fig. 12, 1884; idem, 32, pt. 2, p. 457, pl. 65, fig. 8, 1899.

Euloma affinis WALCOTT, Smithsonian Misc. Coll., vol. 57, no. 13, p. 362, 1914.

Upper Cambrian, Secret Canyon; (loc. 63) northeast of Adams Hill, Eureka District, Nevada.

Holotype.—U.S.N.M. no. 24642.

INGLEFIELDIA Poulsen, 1927

Inglefieldia perola (Walcott)

Ptychoparia perola WALCOTT, Smithsonian Misc. Coll., vol. 67, no. 3, p. 91, pl. 12, fig. 7, 1917.

Although the suture anterior to the eye is less divergent than in species previously assigned to *Inglefieldia*, yet there is no essential difference, and therefore *I. perola* adds a western representative to the genus.

Lower Cambrian, Mount Whyte; (loc. 35m) 3 miles southwest of Lake Louise, Alberta.

Cotypes.—U.S.N.M. nos. 64389, 64390.

KOCHASPIS Resser, 1935

Kochaspis kobayashi, new name

Chancia ? clusia KOBAYASHI (not Walcott), Journ. Pal., vol. 10, no. 3, p. 165, pl. 21, figs. 25-27, 1936.

Lower Cambrian; Carcajou River, lat. 65° N., northern Mackenzie River, Canada.

Cotypes.—Nat. Mus. Canada no. 8713.

KOOTENIA Walcott, 1908

Kootenia tetonensis (Miller)

Marjulia ? tetonensis MILLER (part), Journ. Pal., vol. 10, pt. 1, p. 33, pl. 8, fig. 21, 1936 (not figs. 19, 20 = *Ehmania tetonensis*).

Middle Cambrian, Wolsey; South Fork, Teton Creek Canyon, Teton Range, Wyoming.

Holotype.—Columbia Univ. no. 12610.

Kootenia eurekensis, n. sp.

Dicellosephalus ? quadriceps WALCOTT, U. S. Geol. Surv. Mon. 8, p. 45, pl. 9, fig. 24, 1884.

Compared with *K. quadriceps* this species is much shorter. It does not have a median eye as shown by Walcott.

Middle Cambrian, Eldorado; (loc. 55b) west side of Secret Canyon, Eureka District, Nevada.

Holotype.—U.S.N.M. no. 15449.

Kootenia resseri (Poulsen)

Dorypyge resseri POULSEN, Meddels. Grønland, vol. 70, p. 267, pl. 16, figs. 33-35, 1927.

Middle Cambrian, Cape Wood; Cape Kent, North Greenland.

Cotypes.—Min. Mus. Copenhagen.

Kootenia obliquospina (Poulsen)

Dorypyge obliquospina POULSEN, Meddels. Grønland, vol. 70, p. 271, pl. 16, figs. 40-42, 1927.

Middle Cambrian, Cape Wood; Cape Frederick VIII, North Greenland.

Cotypes.—Min. Mus. Copenhagen.

Kootenia serrata (Meek)

Bathyrus serratus MEEK, 6th Ann. Rep. U. S. Geol. Surv. Terr., p. 480, 1873.

Middle Cambrian, Meagher; northeast of Logan, Montana.

Holotype and paratypes.—U.S.N.M. no. 7865.

Kootenia quadriceps (Hall and Whitfield)

Dikellocephalus quadriceps HALL and WHITFIELD, U. S. Geol. Expl. 40th Par., vol. 4, p. 240, pl. 1, figs. 37-40, 1877.

Olenoides quadriceps WALCOTT, U. S. Geol. Surv. Bull. 30, p. 187, pl. 29, figs. 1-1c, 1886.

Middle Cambrian, Ute; Ute Peak, Bear River Range, Utah.

Cotypes.—U.S.N.M. no. 15448.

Kootenia fordi (Walcott)

Olenoides fordi WALCOTT Amer. Journ. Sci., 3d ser., vol. 34, p. 195, pl. 1, figs. 5, 5a, 1887; 10th Ann. Rep. U. S. Geol. Surv., p. 641, pl. 94, figs. 3, 3a, 1891.

Dorypyge fordi MATTHEW, Trans. Roy. Soc. Canada, 2d ser., vol. 3, sec. 4, p. 187, 1897.

Lower Cambrian, Schodack; (loc. 38c) 1 mile north, and (loc. 38a) 2 miles south of North Granville, New York.

Cotypes.—U.S.N.M. no. 17450.

Kootenia marcoui (Whitfield)

Dikellocephalus ? marcoui WHITFIELD, Bull. Amer. Mus. Nat. Hist., vol. 1, p. 150, pl. 14, fig. 7, 1884.

Olenoides marcoui WALCOTT, U. S. Geol. Surv. Bull. 30, p. 186, pl. 26, figs. 5-5b, 1886.

Dorypyge marcoui MATTHEW, Trans. Roy. Soc. Canada, 2d ser., vol. 3, sec. 4, p. 187, 1897.

Lower Cambrian, Parker; (loc. 25) Parkers Quarry, Georgia, Vermont.

Cotypes.—U.S.N.M. no. 15446.

Kootenia nana (Ford)

Solenopleura nana FORD, Amer. Journ. Sci., 3d ser., vol. 15, p. 126, 1878.

Solenopleura nana WALCOTT, U. S. Geol. Surv. Bull. 30, p. 214, pl. 27, fig. 3, 1886.

Solenopleura nana WALCOTT (part), 10th Ann. Rep. U. S. Geol. Surv., p. 658, pl. 98, figs. 1, 1c-c, 1891.

Ptychoparia trilincata WALCOTT (part), U. S. Geol. Surv. Bull. 30, p. 203, pl. 27, figs. 1a, 1b, 1886.

Ford did not figure the species when it was described. Since his specimen is not available, the best procedure will be to choose Walcott's earliest figure as the lectotype, which is the one cited in Bulletin 30.

Unfortunately, the lectotype is an imperfect specimen, for which reason reference of the specimens subsequently described from Washington County to the species must remain somewhat doubtful. The pygidia illustrated in 1891 show two species, but whether the difference is merely one of drawing cannot now be determined, since one specimen cannot be found.

Lower Cambrian, Schodack; (loc. 27) Troy, and (loc. 38c) 1 mile north of Middle Granville, New York.

Lectotype and plesiotypes.—U.S.N.M. nos. 15425, 17451.

Kootenia troyensis, n. sp.

Solenopleura ϵ *nana* WALCOTT (part), 10th Ann. Rep. U. S. Geol. Surv., p. 658, pl. 98, figs. 1a, 2, 1891 (see *K. nana*).

The illustrations, poor as they are, show the specific difference of this species in size, contour, and width. It may have scattered granules on the test.

Occurrence same as preceding.

Holotype.—U.S.N.M. no. 94342.

Kootenia masoni, new name

Dorypyge quadriceps MASON (not Hall and Whitfield), Bull. Southern California Acad. Sci., vol. 34, pt. 2, p. 116, pl. 15, figs. 18, 20-22, 19? 1935.

This species differs considerably from *K. quadriceps*. The head is shorter, and the pygidium is more completely fused. It is the shortness of the pygidial spines which serves to separate *K. masoni* most easily.

Middle Cambrian, Cadiz; Marble Mountains, California.

Cotypes.—Los Angeles Mus., nos. A-2471-18 to 22.

LITOCEPHALUS, n. gen.

Diagnosis.—Cranidium quadrate or rectangular in outline. Glabella clearly defined, tapered, and truncated in front. Glabellar furrows absent, or a rear pair very faintly indicated. Suture moderately divergent anterior to the eyes. Brim wide. Rim clearly marked, flat but slightly swollen, and more or less upturned. Preglabellar area convex, wide, more than twice width of rim. Eyes of moderate size situated about the middle of the glabella. Fixigenes two-thirds the width of the glabella at the palpebral lobe. Eye lines of moderate development. Test mainly smooth but with other parts unknown.

Litocephalus is similar to *Wilbernia*, only two essential differences being apparent. In the first place, *Litocephalus* is much wider, but too few of the species on hand have been studied to ascertain whether this is a generic difference or only merely the results of comparing two

divergent species. The second, unquestionably a valid generic difference, is the manner in which the brim is divided. In *Wilbernia* the rim, usually occupies fully two-thirds of the brim, whereas in *Litocephalus* it is always less than half the brim width. *Litocephalus* has vertical striations across the preglabellar area and the anterior outline is straighter.

Genotype.—*Dicellocephalus richmondensis* Walcott.

Name.— λιτος = simple ; κεφαλος = head.

Litocephalus richmondensis (Walcott)

Dicellocephalus richmondensis WALCOTT, U. S. Geol. Surv. Mon. 8, p. 441, pl. 10, fig. 7, 1884.

Ptychoparia richmondensis WALCOTT, Smithsonian Misc. Coll., vol. 57, no. 13, p. 352, 1914.

Upper Cambrian, Secret Canyon; (loc. 60) opposite the Richmond mine, and (loc. 61) south of the Hamburg Mine, Eureka District, Nevada.

Holotype.—U.S.N.M. no. 24616.

Litocephalus walcotti, n. sp.

Ptychoparia anytus WALCOTT (not Hall and Whitfield), U. S. Geol. Surv. Mon. 8, p. 56, pl. 9, fig. 26, 1884.

Walcott identified a small cranidium with Hall and Whitfield's species, but besides its smaller size it has a narrower preglabellar area. Its features seem to require its reference to *Litocephalus*. Compared with *L. richmondensis* it has narrower fixigenes.

Upper Cambrian, Secret Canyon; (loc. 63) northeast of Adams Hill, Eureka District, Nevada.

Holotype.—U.S.N.M. no. 24656.

LONCHOCEPHALUS Owen, 1852

Lonchocephalus tipperaryensis (Miller)

Marjunia ? tipperaryensis MILLER, Journ. Pal., vol. 10, no. 1, p. 33, pl. 8, figs. 15, 16, 1936.

Upper Cambrian; Crow Creek canyon, 3 miles north of Tipperary, Owl Creek Range, Wyoming.

Holotype.—Columbia Univ. no. 12606.

Lonchocephalus winona (Hall)

Conocephalites winona HALL, 16th Ann. Rep. New York State Cab. Nat. Hist., p. 161, pl. 7, figs. 26-28, 1863.

Anomocarella ? winona WALCOTT, Smithsonian Misc. Coll., vol. 57, no. 13, p. 358, 1914.

Upper Cambrian, Eau Claire; opposite mouth of Black River, and (loc. 84) Dresbach, Minnesota.

Cotypes.—A.M.N.H.

METISIA, n. gen.

Many heads and tails and several cheeks were recovered from a small limestone boulder at Metis, Quebec. All belong to a single species, which resembles forms younger than Lower Cambrian. Some doubt regarding age remains in all such cases where a fauna is lacking to verify the horizon to which the boulder originally belonged.

Diagnosis.—Cranidium simple, highly arched. Glabella large, occupying fully half of the cranidium; dorsal furrow strong; glabella tapered, rounded in front. Glabellar furrows faintly indicated. Occipital furrow deep; neck ring only slightly swollen in the middle. Fixigenes narrow, arched transversely. No eye lines. Eye lobes moderate in size. Brim confined to a swollen rim. Anterior and dorsal furrows join. Facial suture slightly divergent anterior to the eyes; intramarginal for some distance. Anterior angles turned down for a considerable distance.

Libragenes of normal shape and convexity. Rim heavy, widening somewhat at the genal angle. Length of genal spine unknown.

Pygidium with a high, long, and wide axis. About three segments shown in axis and on pleural lobes. Pleura well fused; three pleural furrows clearly defined.

Surface granulose.

Genotype.—*Ptychoparia metisensis* Walcott.

Metisia metisensis (Walcott)

Ptychoparia metisensis WALCOTT, 10th Ann. Rep. U. S. Geol. Surv., p. 651, text figs. 68a-d, 1891.

Lower Cambrian, boulder in conglomerate; Metis, Quebec.

Cotypes.—U.S.N.M. no. 23838.

MONOCHEILUS, n. gen.

Diagnosis.—Small trilobites with large glabella. Glabella occupies most of head, rounded in front, without glabellar furrows. Brim consists of a single flat, tongue-shaped projection, only as wide as the glabella. Fixigenes lacking. Eyes large; the palpebral lobe arising directly from the dorsal furrow. Posterolateral limbs narrow.

This genus is similar to *Bayfieldia* Clark differing in the lack of fixigenes and in its much larger eyes.

Genotype.—*Conocephalites anatinus* Hall.

Name.—*μονος* = single; *χελος* = brim.

Monocheilus anatinus (Hall)

Conocephalites anatinus HALL, 16th Ann. Rep. New York State Cab. Nat. Hist., p. 158, pl. 7, figs. 34, 35, 1863.

Conaspis anatina Hall, idem, p. 152.

Conaspis anatina WALCOTT, Smithsonian Misc. Coll., vol. 57, no. 13, p. 357, 1914.

Upper Cambrian, Franconia; Trempealeau, and other localities in Wisconsin.

Holotype.—A.M.N.H. no. 329; cast, U.S.N.M. no. 89931.

Monocheilus micros (Walter)

Conaspis micro WALTER, Iowa Geol. Surv., vol. 31, p. 185, pl. 11, figs. 5, 6; pl. 12, fig. 2, 1926.

Upper Cambrian, Franconia; $\frac{1}{2}$ mile southeast of Lansing, Iowa.

Holotype.—Univ. Iowa no. 9239.

ONCHOCEPHALUS, n. gen.

A group of trilobite species lies between the genera *Inglefieldia* and *Proliostracus* on the one hand, while on the other hand there are features like *Poulsenia*, *Antagmus*. Considered in another sense these forms are about midway between *Syspacephalus* and another new genus being described in a paper on the southern Appalachians. For a long time the question was repeatedly considered from all angles, and finally the conclusion was reached that matters would be simplified if another genus were added. In order to stress the features separating the new genus from those mentioned above, the name *Onchocephalus* was chosen to center attention on the development of the brim.

Diagnosis.—Small trilobites in which the cranidium is usually longer than wide. Glabella rather wide, slightly tapered, truncated in front. Glabellar furrows faintly shown to the anterior end of glabella. Contrary to the usual structure in this genus, the anterior pair is more deeply impressed than the others. Fixigenes of nearly even width throughout. Brim of variable width, but always well developed. Pre-glabellar area convex, but variable in width; rim heavy, sometimes greatly expanded, particularly in the center. Eyes small, situated somewhat behind the midpoint of the glabella. Eye lines present.

Genotype.—*Ptychoparia thia* Walcott.

Name.—*ογκος* = protuberance; *κεφαλος* = head.

Onchocephalus thia (Walcott)

Ptychoparia thia WALCOTT, Smithsonian Misc. Coll., vol. 67, no. 3, p. 96, pl. 12, fig. 6, 1917.

Lower Cambrian, Mount Whyte; (loc. 35h) Mount Bosworth, and other localities, British Columbia.

Holotype.—U.S.N.M. no. 64388.

***Onchocephalus walcotti*, n. sp.**

Crepicephalus angusta WALCOTT (part), U. S. Geol. Surv. Bull. 30, p. 208, pl. 28, fig. 2b (only), 1886; 10th Ann. Rep. U. S. Geol. Surv., p. 653, pl. 96, fig. 9 (only), 1891; Smithsonian Misc. Coll., vol. 64, no. 3, pl. 29, fig. 6 (only), 1916 (other figures represent species of *Kochaspis*).

This species is much like *O. thia*, differing in having a wider brim, which makes the whole cranium relatively longer.

Lower Cambrian, Pioche; (loc. 30) 8 miles north of Bennetts Spring, Highland Range, Utah.

Holotype.—U.S.N.M. no. 61642.

***Onchocephalus parvus* (Walcott)**

Anomocare ? *parvum* WALCOTT, U. S. Geol. Surv. Mon. 8, p. 59, pl. 9, fig. 17, 1884; U. S. Geol. Surv. Bull. 30, p. 209, pl. 25, fig. 1, 1886; 10th Ann. Rep. U. S. Geol. Surv., p. 653, pl. 96, fig. 2, 1891.

Lower Cambrian, Pioche; (loc. 51) Prospect Mountain, Eureka District, Nevada.

Holotype.—U.S.N.M. no. 15426.

ORYGMASPIS, n. gen.

Diagnosis.—Cranidium long and narrow, rather flat in both directions. Glabella over two-thirds the length of the head; slightly tapered and rounded in front; dorsal furrow shallow. Three pairs of glabellar furrows, shallow, but clear on exfoliated specimens, scarcely noticeable when the test is preserved. Brim simple, flat, and owing to the slight divergence of the anterior sutures, longer than glabella. In exfoliated specimens a slightly thickened rim is margined in the rear by a row of tubercles. Fixigenes narrow. Eyes situated about the middle of the head, palpebral lobes not separated by furrow or direction of slope from the fixigene.

The pygidium is similar to that of *Taenicephalus* but has a variable number of marginal spines.

Outer test evidently smooth except for striations toward the margins. Exfoliated specimens are sparsely granulose, in addition to the mentioned row of tubercles along the anterior furrow. Further, the preglabellar area is vertically lined in such specimens. Libragenes with long spines, striated on their outer surface.

Genotype.—*Ptychoparia llanoensis* Walcott.

Name.—*ὄρυγμα* = pit; *ασπίς* = shield.

Orygmaspis llanoensis (Walcott)

Ptychoparia llanoensis WALCOTT, Proc. U. S. Nat. Mus., vol. 13, p. 272, pl. 21, figs. 3-5, 1890; U. S. Geol. Surv. Mon. 32, pt. 2, p. 458, pl. 64, fig. 4, 1899.

Conaspis llanoensis WALCOTT, Smithsonian Misc. Coll., vol. 57, no. 13, p. 358, 1914.

Upper Cambrian, Wilberns; (loc. 68) Packsaddle Mountain, 11 miles southeast of Llano, Texas.

Cotypes.—U.S.N.M. no. 23857.

Orygmaspis eryon (Hall)

Conocephalites eryon HALL, 16th Ann. Rep. New York State Cab. Nat. Hist., p. 157, pl. 7, figs. 10-16, 1863.

Conaspis eryon HALL, idem, p. 152, 1863.

Conaspis eryon WALCOTT, Smithsonian Misc. Coll., vol. 57, no. 13, p. 358, 1914.

Upper Cambrian, Franconia; Trempealeau, and other localities in Wisconsin.

Cotypes.—A.M.N.H. no. 327; casts, U.S.N.M. no. 89936; meta-types, U.S.N.M. no. 10011.

PERIOMMA Resser, 1936**Periomma leuka (Walcott)**

Olenopsis leuka WALCOTT, Smithsonian Misc. Coll., vol. 67, no. 3, p. 77, pl. 13, fig. 4, 1917.

This species is not quite typical of the genus, but the extra width of the brim may be attributable to the coarse matrix.

Lower Cambrian, Mount Whyte; (loc. 58g) Mount Bosworth, British Columbia.

Holotype.—U.S.N.M. no. 64397.

Periomma cilles (Walcott)

Ptychoparia ? cilles WALCOTT, Smithsonian Misc. Coll., vol. 67, no. 2, p. 32, pl. 6, fig. 2, 1917.

Lower Cambrian, Mount Whyte; (loc. 63d) Ptarmigan Peak, northeast of Lake Louise, Alberta.

Holotype.—U.S.N.M. no. 63737.

PLAGIURELLA, n. gen.

Small trilobites which have the same general aspect as *Plagiura* in that the facial suture has such a strong converging direction forward, seem to require separate generic recognition.

Diagnosis.—Small trilobites. Glabella long, rather slender, gently tapered, rounded in front. Glabellar furrows faintly indicated. Neck furrow deep and neck ring expanded into short, blunt spine. Facial suture converges slightly anterior to the eyes, but back of them diverges rapidly to form very large posterolateral limbs. Eyes small, situated close to the anterior end of glabella. Eye lines rather strong, with a horizontal course. Brim with a narrow preglabellar area, and thickened, somewhat upturned rim.

Compared with *Plagiura* the new genus had deeper furrows throughout, and also has a raised rim.

Range.—Lower Cambrian, Cordilleran and Appalachian regions.

Genotype.—*Ptychoparia* ? *cleadas* Walcott.

Plagiurella cleadas (Walcott)

Ptychoparia ? *cleadas* WALCOTT, Smithsonian Misc. Coll., vol. 67, no. 3, p. 83, pl. 12, fig. 2, 1917.

Lower Cambrian, Mount Whyte; (loc. 57s) Mount Bosworth, Alberta.

Holotype.—U.S.N.M. no. 64382.

POULSENIA Resser, 1936

Poulsenia cossus (Walcott)

Ptychoparia cossus WALCOTT, Smithsonian Misc. Coll., vol. 67, no. 3, p. 86, pl. 11, figs. 5, 5a, 1917.

Lower Cambrian, Mount Whyte; (loc. 61a) Yoho Canyon, British Columbia.

Holotype.—U.S.N.M. no. 64370.

Poulsenia crassilimbata (Poulsen)

Elrathia ? *crassilimbata* POULSEN, Meddels. Grønland, vol. 70, p. 274, pl. 17, figs. 5, 6, 1927.

Middle Cambrian, Cape Wood; Cape Frederick VII, northwest Greenland.

Holotype.—Min. Mus. Copenhagen.

PROZACANTHOIDES, n. gen.

Diagnosis.—Glabella large, occupying the major portion of the cranidial length, rectangular in shape, with a tendency to expand forward. Three pairs short glabellar furrows, the anterior pair very faint and the rear pair sharply reflexed. Occipital furrow straight and clearly impressed; occipital spine present. Fixed cheeks confined to the large palpebral lobes and small lobes anterior to the eyes. Facial

suture rather strongly divergent anterior to the eyes. Eyes large, extending forward from the occipital furrow. Brim concave, with a narrow rim sometimes demarcated.

Libragenes, hypostoma and thorax unknown.

Pygidium with a prominent axis, rather wide and highly arched, terminated bluntly or with a postaxial ridge. Pleural lobes flat, pleura turning sharply backward and ending in blunt spines; usually well fused but with the pleural grooves showing.

Compared with *Zacanthoides*, *Prozacanthoides* is constructed on a similar plan but the glabella expands forward and the pygidial axis does not take up as much of the total area. In addition the pleura are less fused, remaining more like those of an ordinary trilobite.

Genotype.—*Olenoides stissingensis* Dwight.

Numerous species occur in the Lower Cambrian of the Appalachians.

***Prozacanthoides stissingensis* (Dwight)**

Olenoides stissingensis DWIGHT, Amer. Journ. Sci., 3d ser., vol. 38, p. 147, pl. 6, figs. 9-15, 1889; Vassar Bros. Inst., vol. 5, p. 105, pl., figs. 9-15, 1890.

Lower Cambrian; Stissing, Dutchess County, New York.

Cotypes.—U.S.N.M. no. 18365.

***Prozacanthoides charilla* (Walcott)**

Zacanthoides charilla WALCOTT (part), Smithsonian Misc. Coll., vol. 67, no. 2, p. 40, pl. 6, fig. 9a, 1917 (not fig. 9 = *Clavaspidella sylla*).

Middle Cambrian, Chetang; (loc. 61 o) Chetang Cliffs, 7 miles northeast of Robson Peak, Alberta.

Holotype.—U.S.N.M. no. 63753.

PSALASPIS, n. gen.

Diagnosis.—Peculiar trilobite of about average size. Strongly convex longitudinally and including the libragenes, also in the opposite direction. Glabella tapered, a little more than half the length of the head; conforming in convexity to the cranidium and only outlined by the rather weak dorsal furrow; weak glabellar furrows present; glabella keeled. Brim single, convex and turned downward. Fixigenes narrow. Eyes small, situated behind the middle of the head.

Libragenes evenly and highly convex, without rim and with a weak occipital furrow, extended into very long recurved genal spines.

Genotype.—*Conocephalites patersoni* Hall.

Name.— $\psi\alpha\lambda\iota\varsigma$ = arch; $\alpha\sigma\pi\iota\varsigma$ = shield.

***Psalaspis patersoni* (Hall)**

Conocephalites patersoni HALL, 16th Ann. Rep. New York State Cab. Nat. Hist., p. 159, pl. 7, figs. 45, 46, 1863.

Conaspis patersoni HALL, idem, p. 152.

Conaspis patersoni WALCOTT, Smithsonian Misc. Coll., vol. 57, no. 13, p. 358, 1914.

Upper Cambrian, Franconia; Trempealeau, and other localities, Wisconsin; Reads Landing, Minnesota.

Cotypes.—A.M.N.H. no. 328.

PTYCHOPARELLA Poulsen, 1927***Ptychoparella canadensis* (Kobayashi)**

Chancia canadensis KOBAYASHI, Journ. Pal., vol. 10, no. 3, p. 164, pl. 21, fig. 28, 1936.

Middle Cambrian; Cap Mountain Ridge, Mackenzie District, Canada.

Holotype.—Nat. Mus. Canada no. 8714.

SAUKIELLA Ulrich and Resser, 1933***Saukiella fallax* (Walcott)**

Saukia fallax WALCOTT, Smithsonian Misc. Coll., vol. 57, no. 13, p. 378, pl. 67, figs. 21-22a, 1914.

Upper Cambrian, Wilberns; (loc. 70a) 8 miles northwest of Burnet, Texas.

Cotypes.—U.S.N.M. no. 58647.

STIGMACEPHALUS, n. gen.

In breaking up the *Conaspis* group, it is easy to remove the several diverse forms. One of these, characterized below, lies between *Conaspis* and the radically different genus *Monocheilus*.

Diagnosis.—Rather small trilobites with large glabella. Glabella occupies three-fourths the length of the head, tapered slightly, rounded in front, and usually with pits in the anterior angles of the dorsal furrows. Glabellar furrows practically absent. Brim convex and turned downward, and with only a faint anterior furrow, which involves no change in the slope of the brim. Fixigenes narrow; eyes small, situated about the middle of the head. Librigenes rather large, evenly convex and with stout, long genal spines.

Genotype.—*Conocephalites oweni* Hall.

Name.—στυγμα = puncture; κεφαλος = head.

Stigmacephalus oweni (Hall)

Conocephalites oweni HALL, 16th Ann. Rep. New York State Cab. Nat. Hist., p. 155, pl. 8, figs. 17, 20, 1863.

Conaspis oweni HALL, idem, p. 152, 1863.

Conaspis oweni WALCOTT, Smithsonian Misc. Coll., vol. 57, no. 13, p. 357, 1914.

Upper Cambrian, Franconia; Marine Mills, Minnesota, and localities in Wisconsin.

Cotypes.—A.M.N.H. no. 318; *topotypes*, U.S.N.M. no. 10018.

Stigmacephalus bipunctatus (Shumard)

Arionellus bipunctatus SHUMARD, Trans. Acad. Sci. St. Louis, vol. 2, p. 101, 1862.

Arionellus bipunctatus HALL, 16th Ann. Rep. New York State Cab. Nat. Hist., p. 169, pl. 7, figs. 50, 51, 1863.

Conaspis bipunctata WALCOTT, Smithsonian Misc. Coll., vol. 57, no. 13, p. 358, 1914.

Upper Cambrian, Franconia; Lawrence Creek, St. Croix River and Root River, Minnesota, and localities in Wisconsin.

Cotypes.—(Hall's figures are likely from Shumard's specimens) (Plesiotypes?) A.M.N.H. 337; *metatypes*, U.S.N.M. no. 10007.

TAENICEPHALUS Ulrich and Resser, 1924**Taenicephalus nasutus (Hall)**

Conocephalites nasutus HALL, 16th Ann. Rep. New York State Cab. Nat. Hist., p. 155, pl. 7, figs. 3-9, 1863.

Conaspis nasuta HALL, idem, p. 152, 1863.

Upper Cambrian, Franconia; Kickapoo and other localities in Wisconsin.

Cotypes.—A.M.N.H. no. 313 (casts, U.S.N.M. no. 89938); *metatypes*, U. S. N. M. no. 10014.

TELLERINA Ulrich and Resser, 1933**Tellerina marica (Walcott)**

Dicellosephalus marica WALCOTT, U. S. Geol. Surv. Mon. 8, p. 44, pl. 10, fig. 13, 1884.

Saukia marica WALCOTT, Smithsonian Misc. Coll., vol. 57, no. 13, p. 380, pl. 64, figs. 6, 6a, 1914.

This species is not fully typical of *Tellerina* because of the greater width of the fixigene at the anterior end of the eye lobe. However, it seems undesirable to make a new genus for this species now. If these specimens come from the Secret Canyon formation, this becomes the oldest known species of *Tellerina*.

Upper Cambrian, Secret Canyon; (loc. 62) Canyon north of Adams Hill, Eureka District, Nevada.

Holotype.—U.S.N.M. no. 24565.

TRICREPICEPHALUS Kobayashi, 1936**Tricrepicephalus yellowstonensis**, n. sp.

Crepicephalus texanus WALCOTT (part), Smithsonian Misc. Coll., vol. 64, no. 3, p. 209, pl. 30, figs. 4, 4a, 1916.

Compared with *T. tripunctatus*, the similar species in the region, *T. yellowstonensis* differs first in having fewer granules on the brim and behind the eyes on the fixigenes, and practically none on the glabella. A further very conspicuous difference is the evenness of rim width due to lack of a forward projection in the middle.

Upper Cambrian, Pilgrim; (loc. 151b) between Pebble and Soda Butte Creeks, northeastern Yellowstone Park, Montana.

Holotype and paratype.—U.S.N.M. no. 61523.

Tricrepicephalus beltensis, n. sp.

Crepicephalus texanus WALCOTT (part), Smithsonian Misc. Coll., vol. 64, no. 3, p. 209, pl. 29, fig. 7, 1916.

In general appearance this species resembles *T. yellowstonensis*. It differs in being less convex in both directions but more particularly in the practically even distribution of granules over the entire cranidium.

Upper Cambrian, Pilgrim; (loc. 151i) Smith River, 6 miles north-east of White Sulphur Springs, Montana.

Holotype.—U.S.N.M. no. 61644.

WHITFIELDINA, n. gen.

This peculiar small trilobite is evidently rather rare, although one hand specimen contains more than five cranidia.

Diagnosis.—Glabella quadrate, about half the length of the head, and extends back of the rear margin, without an occipital furrow, the glabella itself tapering to the base of a long, slender spine. Brim wide, with a wide convex preglabellar area and an upturned rim. Fixigenes nearly as wide as the glabella. Eyes small, situated about the middle of the head.

Genotype.—*Conocephalites quadratus* Whitfield.

Whitfieldina quadrata (Whitfield)

Conocephalites quadratus WHITFIELD, Ann. Rep. for 1879, Wisconsin Geol.

Surv., p. 47, 1880; Geol. Wisconsin, vol. 4, p. 180, pl. 1, figs. 15, 16, 1882.

Ptychoparia quadrangularis VODGES, California Acad. Sci. Occ. Papers, vol. 4, p. 353, 1893.

Ptychoparia ? quadrata MILLER, N. A. Geol. p. 565, 1889.

Upper Cambrian, Eau Claire, (Cedaria zone); Eau Claire and other localities, Wisconsin.

Cotypes.—Univ. Wisconsin.

WILBERNIA Walcott, 1924

Wilbernia diademata (Hall)

Conocephalites diadematus HALL (part), 16th Ann. Rep. New York State Cab. Nat. Hist., p. 167, pl. 7, fig. 36; pl. 8, fig. 21, 1863 (not pl. 7, figs. 37, 38 = *W. halli*; pl. 8, fig. 18 = indeterminate fragment).

Hall's figure is not accurate, particularly in the restoration of the eye lobes.

Upper Cambrian, Franconia; Marine Mills, Minnesota.

Cotypes.—A.M.N.H.; cast cranidium, U.S.N.M. no. 89953; meta-types, U.S.N.M. no. 10010.

Wilbernia halli, n. sp.

Conocephalites diadematus HALL (part), see above.

Dicellosephalus misa BERKEY, Amer. Geol., vol. 21, p. 290, pl. 20, figs. 12, 13, 1898.

Compared with *W. diademata*, this species is wider, has a wider preglabellar area, and the rim is more upturned.

Upper Cambrian, Franconia; Root River, and Franconia, Wisconsin.

Cotypes.—A.M.N.H.; plesiotype, Columbia Univ.

Wilbernia walcotti, n. sp.

Ptychozaria ? diademata WALCOTT (part), U. S. Geol. Surv. Mon. 32, p. 462, pl. 64, figs. 2-2b, 1899 (not 2c = *W. hudsonensis* from Wisconsin).

This species is more like the genotype *W. pero* in its curved outline and size. It, however, has a narrower preglabellar area and somewhat wider rim.

Upper Cambrian, Dry Creek; Soda Butte Creek, Yellowstone National Park, Wyoming.

Cotypes.—U.S.N.M. no. 35227.

Wilbernia hudsonensis, n. sp.

Ptychozaria ? diademata WALCOTT (part), U. S. Geol. Surv. Mon. 32, p. 462, pl. 64, fig. 2c, 1899.

Unfortunately, this specimen was never properly labeled, for which reason it is necessary to choose from the specimens on hand from the locality. One pygidium has the same green marks as on the Yellowstone specimens figured at the same time, and likely is the holotype. At any rate it agrees with the drawing, except for obvious restoration.

W. hudsonensis is larger than any described species, but is particularly characterized by the straight course and considerable depth of the pleural furrows and grooves and its transverse anterior margin.

Upper Cambrian, Franconia; (loc. 79) Hudson, Wisconsin.

Holotype.—U.S.N.M. no. 35228.

ZACANTHOIDES Walcott, 1888

Zacanthoides weedi, n. sp.

Zacanthoides sp. WALCOTT, U. S. Geol. Surv. Mon. 32, p. 465, pl. 65, fig. 3, 1899.

This small form is characterized by its reduced rim and furrows (drawn too heavily in the above cited figure). It is possible that when the pygidium is found it will prove to belong to *Prozacanthoides*. It is associated with *Kootenia*.

Middle Cambrian, Meagher; (loc. 151d) Crowfoot Ridge, Yellowstone National Park, Wyoming.

Holotype.—U.S.N.M. no. 94345.