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Palaeozoic Crustacea

The publications and notes on the genera and species
during the past twenty years, 1895-1917

BY

ANTHONY WAYNE VOGDES

INVERTEBRATE
ZOOLOGY
Crustacea

TRANSACTIONS SAN DIEGO SOCIETY ON NATURAL HISTORY

VOL. III, No. 1. July 20, 1917

29.

12, Pic Mill Road,
Doncaster.
29. i. 1949.

Dear Sir,

I have made enquiry regarding separates of the late Dr. Collinge's papers on Isopoda in the M.V. Nat. I have been offered the choice of two sets,

(A) Series of 12 "Notes on the Terrestrial Isopoda (Woodlice)" + 10 other notes and papers.

(B) Series of 11 "Notes on the Terrestrial Isopoda (Woodlice)" (Nos. 2-11) + 3 other notes and papers.

The first set is offered for 51/- and the other for 18/-. Let me know if you would like me to procure either or both.

I believe Dr. Collinge had contemplated a work on these organisms of which the material in question was more or less a preliminary or foundation.

Yours sincerely

W. D. Collins

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BY
ANTHONY WAYNE VOGDES

The object of this fasciculus is to give all the literature
on the Palaeozoic Crustacea, also a general index to its
contents, with a list of the species and remarks on them.
This will aid the student in his researches and save time
in looking up the descriptions of the species and genera.

TRANSACTIONS SAN DIEGO SOCIETY OF NATURAL HISTORY

SAN DIEGO, CALIFORNIA
PRESS OF FRYE & SMITH
JULY 20, 1917

INTRODUCTION

In offering this supplement to the literature of the Palaeozoic Crustacea, the author has brought the list up to date, and corrected some errors and omissions in his Bibliography, previously published by the California Academy of Sciences.

The author has consulted the original papers and the bibliographies of the following authors:

1 **Gehler** (J. C.) De quibusdam rarioribus agri Lipsiensis petrifactis. Spec. 1, Trilobites Entomolithus paradoxus Linne, Lipsiae, 1793, pp. 7-9.

The author gives a list of works on fossil crustacea.

2 **Walch** (J. E. T.) Des Trilobites dan le regne des petrifications, etc. Natural History of Petrifications to illustrate Knorr's Collection.

Nuremb. fol., part 2, pp. 95 (1768) and part 3, p. 129 (1771).

The author gives the name of Trilobites to the class and brought together everything that had been hitherto written on the Trilobites.

3 **Brunnich** (M. T.) Beskrivelse over Trilobiten.

Nye Samlig. of det Kongelige Danske Videnskabers Selskabs Skrifter, Kiöbenhavn, 1781, pp. 384-389.

Gives historical sketch of the papers on Trilobites.

4 **Burmeister** (Hermann). The Organization of Trilobites.

German Edition, 1843; English Edition, 1846.

The author gives a Bibliography, pp. VII-X, 1698-1845.

5 **Barrande** (J.) System Silurien du centre de la Bohême, 1852, Trilobites.

Vol. 1, and supplement.

Gives Bibliography of the families.

6 **Törnquist** (S. L.) Undersögningar öfver Siljansomradets Trilobitfauna.

1884, Sveriges Geol. Undersökning, ser. C, No. 66, pp. 4-7.

Gives list of authors.

7 **Schmidt** (Fr.) Revision of the Baltic Silurian Trilobites.

Mem. Acad. Imp. Sci., St. Petersburg, 1881-1907.

Notes on the genera and bibliography.

8 **Holm** (G.) De Svenska Arterna af Trilobitslaget Illaenus.

Bihang till K. Svenska Vet. Akad. Handl. Bd. 7, No. 3, 1882.

Gives the Literature on the genus Illaenus, 1853-1872, pp. V-XIV.

9 **Vogdes** (A. W.) A Bibliography of Palaeozoic Crustacea from 1698 to 1889, including a list of North American species and a systematic arrangement of the genera.

Bull. U. S. Geol. Sur., No. 63, 1890.

This paper gives a list of authors; also that of the genera, but not that of the species described in each work.

The 2d and 3d parts a Catalogue of North American species.

10 **Vogdes** (A. W.) A classed and annotated Bibliography of the Palaeozoic Crustacea, 1798-1882, to which is added a Catalogue of North American species.

California Acad. Sciences Occasional Papers, No. 4, 1893.

This work contains a list of the genera and species described in each paper and a catalogue of North American species.

11 **Vogdes** (A. W.) A supplement to the Bibliography of the Palaeozoic Crustacea.

Proc. Cal. Aca. Sci., 2d ser., vol. V, 1895, pp. 53-76.

12 **Taschenberg** (O.) Bibliograeca Zoologica II. verzeichniss der schriften ueber Zoologie welche in den Periodischen werken, 1861-1880, pp. 5165-5188, Leipzig, 1905.

13 **Calman** (W. T.) Zoological Record Crustacea X, vol. 39-47, 1902-1913.

A Classified and Annotated Bibliography of the Palaeozoic Crustacea, Part 2; Supplement to Occasional Papers California Academy of Science, Embracing the Publications for the Years 1895 to 1917.

Airaghi (Carlo). Di alcuni Trilobiti della Cina.

Atti Mus. Milano, vol. 41, 1902, pp. 3-13, plate.

The author describes *Agnostus Pii* n. sp. compares *Agnostus acadicus* Hartt and other species, the new species very much like *Agnostus Chinenis*, Dames, 1883.

Olenoides Paronai n. sp., *O. Leblanci* Berg. *Microdiscus Paronai* n. sp.

Drepanura premesnili, Berg. Trilobites gen. sp. ind.

Part 2 describes a Trilobite from Scitan tung, Teingan, as *Cheirurus Paronai* n. sp.

Ami (Henry). *Belinurus grandaeus*, a new species of Palaeozoic limuloid Crustacean recently described by Prof. T. Rupert Jones and Dr. Henry Woodward, from the Eo-Carboniferous of Riversdale, Nova Scotia.

Ottawa Nat., vol. 13, 1899, pp. 207-208.

See also Geol. Mag., Decade 4, vol. 6, 1899, pp. 388-395, pl. 15.

The genus *Belinurus* has been found in Lower Devonian and Silurian forms in the Kilhorcan beds of Ireland.

See Review of this paper, Geol. Mag., Decade 4, vol. 7, p. 177, 1900.

Andrée (Karl). Zur Kenntniss der Crustaceen Gattung *Arthropleura* Jordan, und deren systematischer Stellung.

Paläontographica Bd. 57, Stuttgart, 1910, pp. 67-103, plates 4-5. *Arthropleura armata*, Jordan, *A. mammata*, Salter.

Gives a Bibliography of the literature on *Arthropleura*, 1854, 1909.

——— Neue Funde von *Arthropleura armata* Jordan.

Centralbl. für Mineral, 1909, pp. 753-755.

Arber (E. A. Newell). The Culm Measures of the Exeter District.

Geol. Mag. Decade 5, vol. 8, 1911, p. 495.

The Arthropod remains from Nottinghamshire and Derbyshire coal fields in this paper are described and illustrated by Lewis Moysey.

Leaia trigonoides sp. nov. Glabella region of *Prestwichia* figured.

Baldwin (Walter). *Belinurus* König from Sparth, Rochdale.

Trans. Manchester Geol. and Mining Soc., vol. 28, pt. 6, 1905, pp. 198-202.

The author remarks *Belinurus* is generally associated with Unio-like shells and scattered plant remains, and suggests that it was an inhabitant of shallow, muddy water and lived in close proximity to the shore line. He also gives a Bibliography of the genus.

Belinurus forms were first discovered in the Pennystone iron nodules of the Coal Measures at Dudley in Staffordshire and Coalbrook Dale, in Shropshire.

Martin, the first author to describe a species in 1809 (*Petrifacata Derbiensia*, pl. 45, fig. 4), classes it among the Trilobites as *Entomolithus lunatus*.

Charles Koenig, who was the first keeper of the Mineralogical and Geological Department in the British Museum in the year 1825.

Published under the title of *Icones Fossilium sectiles*, n. d. (1820) in two parts:

The First Centuria has only 8 plates and 100 figures accompanied by descriptions.

The Second Centuria, consisting of plates 9-18, figures 101-248, was issued without text descriptions.

Koenig gives the name of *Belinurus bellulus* to fig. 230, without a description of the new genus.

——— *Prestwichia anthrax* and *Belinurus lunatus* from Sparth Bottoms, Rochdale.

Trans. Manchester Geol. Soc. vol. 29, 1904-1905, pp. 124-127, with 2 figures.

The author figures *Prestwichia anthrax* described under the name of *Limulus anthrax* by Prestwich in 1840, and refers to *Belinurus lunatus* Konig's *Belinurus bellulus*.

The author remarks, that it certainly is not a fossil insect, as indicated by Martin in *Petrifacata Derbiensia*, pl. 45, fig. 4, 1809.

Bäther (F. A.) *Harpes bucco*. A new Silurian Trilobite from the Carnic Alps.

Catania Rivista Italiana di Palæont., 1910, 7 pp., figure.

The trivial name *bucco* alludes to the swollen cheek roll, which with its ornament is so marked a character to the species.

Barth (Hermann von). Die Stellung der Trilobiten in Zoologischen Systemen.

Das Ausland 26 Jahrg, 1875, p. 25.

The author quotes Billings's paper; also that of Dana on the feet of Trilobites, and refers to the discoveries of E. von Eichwald in Wesenberg in Estland, and in the Island Dago near Hohenholm.

N. Jahrb für Mineral. and Geol. vol. 1, 1875.

Barton (Donald C.) A new genus of the Cheiruridae with descriptions of some new species.

Bull. Mus. Comp. Zoology, vol. LIV, No. 21, 1913, with one plate.

The new genus *Ceraurinus* is like *Cheirurus insignis* Beyrich in size.

The glabella is subrectangular or expanded only slightly. The posterior of the 3 pairs of glabellar furrows are straight, about one-third the width of the glabella in length, and slope gently backwards.

Their inner ends are connected with the neck furrows by curving constrictions, which are about parallel to the axis of the glabella.

The constrictions are strong in some species and flat in others.

The middle part of the axial portion of the neck furrow is parallel to the posterior edge of the neck segment.

The eyes large.

Thorax 11 segments, presumably.

Pygidium only in *C. icarus* Billings, three to four segments ending in six free spines of equal length.

Type *Ceraurinus marginatus* sp. nov.

The author includes in the genus *C. icarus* Billings, *C. trentonensis*, sp. nov., *Crytometopus scofieldi* Clarke, *Cheirurus polydorus* Billings, and *C. pompilius* Billings.

He refers *Ceraurus meekanus* Miller, 1889, to *C. icarus* Billings.

The paper ends with a fragment, described as *Ceraurinus confluentis*, n. sp.

——— A revision of the Cheirurinae with notes on their evolution.

Washington Univ. Studies, vol. 3, part 1, No. 1, 1915.

BARTON (Donald C.)—Continued

The author places under the family cheirurinae twenty genera divided into two sections.

Group 1. Cheirurinae with plural furrow horizontal, thoracic segment rarely 9, generally with 10 or 12.

Under this group he places:

Eccoptochile Corda, genotype *E. claviger* Beyr., with figure.

Actinopeltis Corda, genotype *A. globosus* Barr., with figure.

Cyrtometopus Angelin, genotype *C. clavifrons* Dal., with figure.

Sphaerexochus Beyrich, genotype *S. mirus* Beyr., with figure.

Anacheirus Reed, genotype *A. Frederici* Salt., with figure.

Pilekia new genus, genotype *Ch. apollo* Bill., with figure in text.

This is an early Ordovician genus unlike the Cheirurinae. The author figures the glabella, which contracts forwards with three pair of glabellar furrows; pygidium composed of 4 complete segments and a terminal axial plate, the ribs terminating in long spines. He refers *Ch. gracilis* Barr., *Cyr. foveolatus* Ang. and with doubt *Ceraurus Clintoni* Foerste to the genus.

Nieszkowskia Schm., genotype *N. cephaloceras* Nieszk., with figure.

Kawina new genus, genotype *Ch. vulcans* Bill., fig. of head in text.

The glabella large and composing one-half of the head strongly swollen, and with a tendency for a faint hump at the posterior. Three pairs of glabellar furrows, facial suture running almost parallel to the sides of the glabella, and cutting the border at the genal angles or slightly in towards the axis. Genal angles without spines.

The author refers to this genus *Ch. prolificus* Bill., *Ch. mercurius* Bill., *Pseudo-sphaer. Billingsi* Raym. and *Pseudo-sphaer. approximatus* Raym.

Pseudosphaerexochus Schm., genotype *P. hemicranium* Kut., with figure, includes 11 species. *Cheirus Paronai* Airaghi probably belong here, but the author does not include it.

Placoparia Corda, genotype *P. Zippei* Boeck, with figure.

The author includes also *Calymmene tourneminei* Rouault, but does not mention *P. cambriensis* Hicks.

Area Barr., genotype *A. bohénica* Barr., fig. in text.

The author includes *A. Fritschii* Barr., but no mention of *A. suecica* Olin.

Prosopiscus Salter, genotype *P. mimus* Salt., with figure.

Typhloniscus Salter, genotype *T. Bainii*, figure in text.

Sphaerocoryphe Angelin, genotype *S. dentata* Ang.

This is a Swedish species, the figure 16 in the text after Schmidt, looks more like *S. cranium* Schm. pl. 8, fig. 7.

Hemisphaerocoryphe Reed, genotype *H. pseudo-hemicranium* Nieszk., with figure.

This is an intermediate genus between Cyrtometopus and Sphaerocoryphe. From Cyrtometopus this genus can be distinguished by its highly inflated frontal lobe. From Sphaerocoryphe it may be distinguished by its obtusely triangular free cheeks and by its posterior pair of glabellar furrows, which bend sharply backward instead of extending across the glabella.

The author includes besides the type *Metopias aries* Eichw. and *Cyrt. Rosentali* Schmidt.

Group 2. Cheirurinae with constricted pleurae and with diagonal pleural furrows, Lehua nov., genotype *Ch. vinculum* Barr.

The genus resembles Eccoptochile and Anacheirus. From the former it is most readily distinguished by its lack of eyes or, if present, situated far forward, and by the diagonal pleural furrow, and by the slender spine-like termination of the pleurae.

The author includes besides the type *Typhloniscus princeps* Reed and *Ch. inexpectatus* Barr.

BARTON (Donald C.)—Continued

Cheirurus Beyrich genotype *Ch. insignis* Beyr., with figure.

The genus can be readily distinguished from Ceraurus and Ceraurinus by the triangular basal lobes of the glabella, the inner points of which are not separated by a portion of the glabella; also by the hypostoma.

Crotalocephalus Salter, genotype *C. Sternbergi* Boeck. Fig. of head in text.

Ceraurinus Barton, genotype *C. marginatus*. Fig. in text.

Distinguished from Cheirurus and Ceraurus by the rather large ovate to subrectangular basal glabellar lobes.

Ceraurus Green, genotype *C. pleurexanthenus*. Fig. in text.

The author does not include Youngia, a genus described by Lindstrom, with *Cheirurus trispinus* for its type, in 1885—not Youngia, Jones & Kirby, 1886.

The genus has long genal spines with aculate occipital ring, and may be compared with Nieszkowskia.

Lindstrom genus has a peculiar axis to the thorax, the first axial joint being furnished with a pair of small lateral processes on the anterior margin.

Barbour (E. H.) Carboniferous Eurypterids of Nebraska.

Am. Jour. Sci., 4th ser., vol. 38, 1914, p. 507, figs. 1 and 2.

The author describes *Eurypterus (Anthracoptes) nebraskensis* nov., from the Coal Measures near Peru, Nebraska.

The main features are the vermiform appearance, the long spatulate paddles, and the spinous ridges upon the last 5 tergites of the post abdomen.

Fig. 2 represents an unnamed sp.

Basser (Ray S.) Bibliographic index of American Ordovician and Silurian Fossils.

U. S. Natl. Mus. Smithsonian Inst. Bull. 92, volumes 1 and 2, 1915.

The author gives a historical index to the genera and the North American species of Palaeozoic crustacea during Ordovician and Silurian epochs.

Beecher (Charles E.) Notes on Cambrian fossils of St. Francis County, Missouri.

Am. Jour. Sci., ser. 4, vol. 12, 1891, pp. 362-363.

——— On the thoracic legs of Triarthrus.

Am. Jour. Sci., ser. 3, vol. 46, 1893, pp. 469-470.

——— The larval stages of Trilobites.

Am. Geol., vol. 16, 1895, pp. 166-197, plates 8-10.

The author gives a review of larval stages of Trilobites.

Analysis of variations in Trilobite larvae.

Antiquity of the Trilobite.

Restoration of the protaspis, etc.

The author remarks in regard to the larval stages of the following Trilobites from the Cambrian:

Solenopleura robbi Hartt., after Matthew.

Larva very minute and circular in outline; the glabella is obscurely annulated and extends to the anterior margin, where it is expanded.

The neck ring is only one, well defined; abdominal portion is less than one-third the whole length, and is limited by a slight transverse furrow; no traces of eyes or free cheeks.

Liostracus onangondianus Hartt., after Matthew.

BEECHER (Charles E.)—Continued

This form is similar to the preceding though larger, and with the glabella more rapidly expanding in front. The neck segment is the only one which is distinct.

Ptychoparia linnaarsoni Walcott, after Matthew.

The axis is narrow, expanding in front, and obscurely ringed; 5 annulations belonging to the head and one to the pygidium, which is very short and separated from the cephalon by a distinct groove.

Ptychoparia kingi Meek.

The author remarks that fig. 6 which is referred to a later stage, shows the inception of several characters that have not as yet appeared in the previous larvae. The axis is very strongly annulated; the anterior lobe is nearly as long as the 4 posterior annulations of the cephalon, and on each side there is a furrow representing the eye line of the adult; the free cheeks are present as narrow marginal plates including the genal spines; the pygidium shows 2 segments separated by a furrow.

The author figures *Sao hirsuta* Barrande, pl. 8, figs. 8-1.

Ordovician species.

Triarthrus becki Green.

Two protaspidan stages of this species have been noticed, differing chiefly in the size of the pygidium. Both agree in showing a strongly annulated axis, not expanded in front and terminating some distance within the margin.

Acidaspis tuberculata Conrad.

In general form the larvae resembles those of the second larvae stage of *Sao*, but the pygidium is shorter and the glabella does not expand and terminate in the anterior margin. No eye-line is present, but the eye lobes may be seen a little within the margin. The glabella has the characteristic number of annulations: margin provided with a row of denticles; genal angles extended into spines; pygidium with 4 spines.

The generic term *Arges* Goldfuss pre-occupied. See Ceratages, Gürich, 1901.

Arges consanguineus Clarke.

As the main details of structure in *Acidaspis* and *Arges* are so similar the young *Arges* show the same acceleration in the development of the spines and surface ornamentation and the retention of the primitive features of the glabella.

Proetus parvisculus Hall.

The illustrations of this species show strongly annulated axis with groove at each side; large, prominent anterior eyes, pygidial pleura indicated by faint grooves.

Dalmanites socialis Barrande.

The author gives 4 figures of this species.

The anaprotaspis stage showing the large, strongly annulated axis, the prominent anterior marginal eyes, mucronate genal angles. Pygidium of 3 segments.

Figures 1-8 in the text illustrate the young of *Agnostus nudus* Barr.

A. rex Barr., *Trinuclerus ornatus* Sternb., *Hydrocephalus saturnoides* Barr. and *H. carens* Barr., *Olenellus (Mesonacis) asaphoides* Emmons.

——— The Monophology of *Triarthrus*.

Am. Jour. Sci., ser. 4, vol. 1, No. 4, 1896, pp. 251-256.

Geol. Mag., Decade 4, vol. 3, 1896, pp. 193-197, pl. 9.

——— Outlines of a natural classification of the Trilobites.

Part 1, Am. Jour. Sci., ser. 4, vol. 3, 1897, pp. 89-106, plate 3; continued on pp. 181-207.

Order Hypoparia.

Free cheeks, forming a continuous marginal ventral plate of the head, and in some forms also extending over the dorsal side at the genal angles.

Suture ventral marginal, or submarginal.

BEECHER (Charles E.)—Continued

Compound paired eyes absent; simple eyes may occur on each fixed cheek singly or in pairs.

Including the families Agnostidae Dalman, Fam. 2, Harpeididae Barrande, Fam. 3, Trinucleidae Barrande.

The first family includes the genera Agnostus Brongniart and Microdiscus (Emmons) Salter.

The second family, the genera Harpes, Goldfuss, Harpina Novák and Harpides Beyrich.

The third family, Trinucleus Lhwyd, Ampyx Dalman, Dionide Barrande, Endymionia Billings, Lonchodomas Angelin, Raphiophorus Angelin and Salteria W. Thompson.

Order B Opisthoparia.

Free cheeks generally separate, always bearing the genal angles.

Facial sutures extending forwards from the posterior part of the cephalon within the genal angles, and cutting the anterior margin separately, or rarely uniting in front of the glabella.

Compound paired holochroal eyes on free cheeks, and well developed in all but the most primitive families.

Fam. 4, Conocoryphidae Angelin, including the genera and subgenera.

Conocoryphe Corda Aneucanthus Ang. Atops Emmons, Avalonia Walcott, Bailiella Matthew, Bathynotus Hall, Carausia Hicks, Carmon Barr.

Ctenocephalus Corda, Dictyocephalites Bergeron, Eryx Ang., Harttia Walc., and Toxotis Wallerius.

Family 5, Olenidae Salter, including the genera.

Olenus Dalm. and the following genera and subgenera, which should fall into several sub-family or even family groups.

Acerocare Ang., Acrocephalites Wallerius, Agraulus Corda, Angelina Salter.

Anomocare Ang., Anopolenus Salter, Asaphelina Bergeron, Bavarilla Barr.

Bergeronia Matthew, Boeckia Brögger, Ceratopyge Corda, Chariocephalus Hall.

Corynexochus Ang., Crepicephalus Owen, Ctenopyge Linnarsson, Cyclognathus Linnr., Dikelocephalus Owen (Centroleura Ang.), Dorypyge Dames.

Ellipsocephalus Zenker, Elliptocephala Emmons, Euloma Ang., Eurycare Ang., Holmia Matthew, Hydrocephalus Barr. (young Paradoxides), Leptoplastus Ang., Liostracus Ang., Loganella Devine, Menocephalus Owen, Mesonacis Walc., Miemacca Matthew, Neseuretus Hicks, Olenelloides Peach, Olenellus Hall, Olenoides Meek, Oryctocephalus Walc., Palaeopyge Salter, Parabolina Salter, Parabolinella Brögger, Paradoxides Brong., Peltura Ang., Plutonides Hicks, Proceratopge Wallerius, Protagraulos Matthew, Protolenus Matthew, Protopeltura Brögger, Protypus Walc., Pterocephalia Roemer, Ptychaspis Hall, Ptychoparia Corda, Remopleurides Portlock, Sao Barr., Schmiditia Marcou, Solenopleura Ang., Sphaerothalmus Ang., Telepus Barr., Triarthrella Hall, Triarthrus Green, and Zakanthoides Walc.

A number of genera have been made the types of family divisions, as Paradoxides, Olenellus, Remopleurides, Ellipsocephalus, Ptychoparia, etc.

Family 6, Asaphidae Emrich, including the genera and subgenera.

Asaphus Brong., Asaphellus Callaway, Asaphiscus Meek, Barrandia McCoy, Basilicus Slater, Bathyurellus Billings, Barthyuriscus Meek, Bathyrurus Bill., Bolbocephalus Whitfield, Brachyaspis Salter, Bronteopsis W. Thompson, Dolichometopus Ang., Gerasaphes Clarke, Holasaphus Matthew, Homalalopecten Salter, Isotelus Dekay, Megalaspides Brögger, Megalaspis Ang., Niobe Ang., Ogygia Brong., Ogygiopsis Walc., Phillipsinella Novak, Platypeltis Callaway, Ptychopyge Ang. and Stygina.

The author includes under Illaenidae the genera Illaenus Dalm., Æglina Barr.,

BEECHER (Charles E.)—Continued

Bumastus Murch., Dysplanus Burmeister, Ectillaenus Salter, Holocephlina Salter, Hydralenus Salter, Illaenopsis Salter, Illaenus Hall, Nileus Dalm., Octillaenus Salter, Panderia Volboth, Psilocephalus Salter, Symphysurus Goldfuss, and Thaleops Conrad.

Family 7, Proetidae Barrande.

Genera Proetus Steininger, Arethusina Barr., Brachymetopus McCoy, Celmus Ang., Cordania Clarke, Crotalurus Volb., Cyphaspsis Burm., Dechenella Kayser, Griffithides Portl., Phaetonella Novák, Phillipsia Port., Prionopeltis Corda, Pseudophillipsia Gemmellaro, Schmidtella Tschernyschew, Tropidocoryphe Novak, and Xiphogonium Corda.

Family 8, Bronteidae Barrande.

Family 9, Lichadidae Barrande.

Genus Bronteus Goldfuss (Goldius DeKoninck).

Genera Lichas Dalm., Arcinurus Castelnau, Arges Golf., Ceratolichas Hall and Clarke, Conolichas Dames, Dicanognmus Corda, Homolichas Schmidt, Hopolichas Dames, Leiolichas Schmidt, Metopias Eichwald, Oncholichas Schmidt, Platymetopus Ang., Terataspis Hall, Trochurus Beyrich and Uralichas Delgado.

Family 10, Acidaspidae Barrande.

Genera Acidaspis Murch., Ancyropyge Clarke, Ceratocephala Warder, Dicanurus Conrad, Odontopleura Emmrich and Selenopeltis Corda.

Order C, Proparia.

Free cheeks not bearing the genal angles; facial sutures extending from the lateral margins of the cephalon in front of the genal angles, inward and forward, cutting the anterior margin separately or uniting in front of the glabella.

Compound paired eyes, scarcely developed or sometimes absent in the most primitive family; well-developed and schizochroal in last family.

Family 11, Encrinuridae Linnarsson.

Genera Encrinurus Emmrich, Areia Barr., Cybele Loven, Dindymene Corda, Placoparia Corda and Prosopiscus Salter.

Family 12, Calymmenidae Brongniart.

Group 1, Calymmene Brong., and Calymnella Bergeron and Calymenopsis Munier-Chalmas and Bergeron.

Second Group, Homalonotus Koenig, Brongniartia Salter, Burmiesteria Salter, Trimerus Green, Ptychometopus Schmidt, Pharostoma.

Calymenopsis and Calymnella are closely related to Calymmene.

Family 13, Cheiruridae Salter.

Genera Cheirus Beyrich, Actinopeltis Corda, Amphion Pander, Anacheirus Reed, Ceraurus Green, Crotalocephalus Salter, Cyrtometopus Ang., Deiphon Barr., Diaphanometopus Schmidt, Eccoptocheile Corda, Hemisphaerocoryphe Reed, Nieszkowskia Schmidt, Onycopye Woodward, Pseudosphaerexochus Schmidt, Sphaerexochus Beyrich, Sphaerocoryphe Ang., Staurocephalus Barr., and Youngia Lindström.

Family 14, Phacopidae Salter.

Genera Phacops Emmrich, Acaste Goldf., Chasmops McCoy, Coronura Hall, Corycephalus Hall and Clarke, Cryphaeus Green (preoccupied for a genus of Coleoptera, 1833), Dalmanites Emm., Homalops Remele and Dames, Monorachos Schmidt, Odontocephalus Conrad, Pterygometopus Schmidt, Symphoria Clarke, and Trimeroccephalus McCoy.

Note—Other subdivisions and classification of the Lichidae have been made by Gürich, and also by Reed.

The other families have been reclassified by Reed, Walcott and Raymond. Walcott remarks, in regard to Damesella, that the facial suture cuts the postero-lateral margin outside of the genal angle, so as to leave the genal angle on the fixed cheeks; the spine corresponding to the genal spine in other genera of the order Proparia is on the free cheeks.

BEECHER (Charles E.)—Continued

——— Trilobites in the Text Book of Palaeontology (Zittel's).

Translated by Charles R. Eastman, London and New York, 1900, pp. 607-638.

——— Restoration of *Stylonurus Lacouus*, a giant Arthropod from the Upper Devonian of the United States.

Am. Jour. Sci., ser. 4, vol. 10, 1900, pp. 145-150, plate.

——— The same.

Geol. Mag., Decade 4, vol. 7, 1900, pp. 481-485.

The author remarks that this specimen was collected in 1870, and loaned to Prof. Hall and described as *Eurypterus Beecheri* Hall, in 1884, in 36th Ann. Rep. N. Y. Mus. Nat. Hist. as *Stylonurus excelsior* as Hall's species. This paper appeared some months later than Claypole's paper, and the name *Dolichocephala Lacoana* has priority over *Stylonurus excelsior* and must be recognized.

Claypole's paper appeared in Proc. Am. Phil. Soc., vol. 21, April, 1883, to Jan., 1884.

——— Discovery of Eurypterid remains in the Cambrian of Missouri.

Am. Jour. Sci., ser. 4, vol. 12, 1901, pp. 364-366, plate.

Strabops Thacheri n. gen. et sp.

See also Geol. Mag., Decade 4, vol. 8, 1901, pp. 559-564, figure.

The generic name is in allusion to the inward turning or squinting of the eyes (squinting face).

The cephalothorax is comparatively shorter and wider than in *Eurypterus*; the eyes are further forward, nearer together and more oblique, and besides it has a telson, but 11 abdominal somites can be determined on the dorsal side, instead of 12 as in *Eurypterus*.

——— Ventral integuments of Trilobites.

Am. Jour. Sci., ser. 4, vol. 13, 1902, pp. 165-174, with 3 plates; also Geol. Mag., Decade 4, vol. 9, 1902, pp. 152-163, with 8 figures.

The author illustrates *Triarthrus Becki* Green, *Ptychoparia striata* Emm., *Asaphus magistus* Locke, and *Calymmene senaria* Conrad.

——— Note on a new Xiphosauran from the Upper Devonian of Pennsylvania.

Am. Geol., vol. 29, 1902, pp. 143-146.

Prestwichia Randallii n. sp., with figure.

——— On Palaeozoic Phylloporida from Pennsylvania.

Quart. Jour., Geol. Soc., vol. 58, 1902, pp. 441-449, plates.

Tropidocaris bicarinatus Beecher, *T. alternata* Beecher, *Elynocaris siliqua* Beecher.

Tropidocaris Bicarinata Beecher

Benden Van (M. E.) On the systematic position of the King Crabs and Trilobites.

Ann. Mag. Nat. Hist., ser. 4, vol. 9, 1872, p. 98.

Bernard (Henry M.) Trilobites with antennae at last.

Nature, 1903.

——— Systematic position of the Trilobites.

Geol. Mag., Decade 5, vol. 1, 1894, p. 230.

The author remarks the trilobites may be briefly described as fixed specialized stages in the evolution of the Crustacea, from an annelidan ancestor, with its mouth bent round ventrally, so as to use its parapodia as jaws.

—— Application of the sand blast for the development of Trilobites. *Geol. Mag.*, Decade 4, vol. 1, 1894, p. 553.

Berkey (Charles P.) *Geology of the St. Croix Dalles.*

Am. Geol., vol. 21, pp. 270-294, plates 18-21, 1898.

The author includes and illustrates the following Trilobites:

Agraulus convexus Whitf., with var. A and B, *A. hemisphericus* n. sp.

Ptychoparia calymenoides (Whitf.). The genotype of *Menomonion* new genus by Walcott, 1916.

Cheilocephalus n. gen.

The author figures the glabella and fixed cheeks. Cephalic shield semi-circular, strongly convex, about equal to one-fourth part of a spheroid (front limb), formed by a narrow ring projecting at a right angle beyond the general surface of the shield. Glabella broad, convex anteriorly, slightly convergent and reaching to the narrow marginal rim; surface nearly smooth with two pairs of scarcely perceptible furrows; marginal grooves not strongly marked; faint occipital ring, but more strongly marked on the cheeks. Fixed cheeks, broad and conforming to the general spherical outline; the posterior margin developed in a spine-like projection a little removed from the glabella. Eyes a little anterior to the middle and remote from the glabella. Facial sutures extend from the eyes forward almost parallel to the side of the glabella and backward, with a double curve to the genal angle.

Cheilocephalus St. Croixensis n. sp. (Facial suture like *Cyclognathus*.)

The author also figures *Dikelocephalus misa* Hall, referred by Walcott to the genus *Anomocare*.

Berjeron (J.) *Notes Palaeontologiques.*

Bull. Soc. Geol. France, 3rd ser., vol. 23, 1895, p. 465, plates 4-5.

Calymenopsis Filacovi n. gen. et sp. *Amphion, Escorti* n. sp.

Dicelloccephalus? Villerbruni n. sp. *Asaphelina Barroisi* Mun. Ch. et J.

Berg. *Ogygia Lignieresti* n. sp. *Egline Sicardi* n. sp. *Egline? Savini* n. sp.

Dictyocephalus Villerbruni n. gen. et sp.

The author remarks that the new genus *Calymenopsis*, "Il est caracterise par la presence de pointes genales par la forme de la grande suture; par le presence de cavites dans le sillon anterieur, cavites qui semblent etre comparable a cellos du limbe des *Trinucleus*; par la presence d'une bande oculaire; enfin par la forme en pyramide des joues mobiles."

—— Notes Paléontologique—Crustacés iv étude de quelques Trilobites de Chine.

Bull. Soc. Geol. France, 3rd ser., vol. 27, 1899, pp. 499-515. Plate.

Calymene? sinensis n. sp. This species forms the genotype of *Blackzelderia* Walcott, new genus. *Agnostus Douvillei* n. sp. *Olenoides Leblanci* n. sp.

Dicelloccephalus? sinensis n. sp. Walcott Cambrian Fauna of China, p. 35, places this species under his new genus *Damesella*.

Drepanura Premesnilli n. gen. et sp. Compare *Bathynotus, holopyga* Hall.

Arthricocephalus Chauveaui n. gen. et sp.

"La caracteristique de cette forme est la structure anneelee de tout son corps et en particulier de la glabella. Celle-ci semble formee d'anneaux superposes et a ce point de vue seulement elle rappelle la disposition caracteristique du genre *Olenellus*."

Bézier (T.) On *Nilocus Beaumanti* Rouault, 1847.

Palæontologia Universalis Fasc. 3, ser. 2, 1907, p. 119, plate.

The species was described by Rouault. Bull. Soc. Geol. Fr., 2d ser., vol. 14, 1847, pp. 321 and 326.

Distinguished from *Nilocus Armadillo* by its large pygidium.

——— On *Prionocheilus Verneuli* Rouault, 1847.

Palæontologia Universalis Fasc. 3, ser. 2, 1907, p. 120, plate.

The author refers *Calymmene pulchra* Barr., to this species, and refers Corda genus *Pharostoma* to Rouault's older genus *Prionocheilus*, which was described by Rouault in Bull. Soc. Geol. Fr., 2 ser., vol. 4, 1847, pp. 320-321, pl. 3, figs. 3 and 3a.

As *Prionocheilus Verneuli*, the holotype shows spines on the outer margin of the head.

The species has been referred to *Calymmene* by Barrande.

To *Pharostoma* by Corda, Pompecki and Angelin.

The name of *Verneuli* for a species of *Calymmene* has been used by d'Orbigny, 1842. Tromelin and Lebesconte, 1876, Assoc. Fr. Sc., Congres Nantes, p. 629, changes the name from *Calymmene Verneuli* to that of *Calymmene Prionocheili*.

Bigot (A.) Catalogue critique de la collection DeFrance, conservée au Musée d'histoire Nat. de Caen.

Bull. Soc. Normand, vol. 8, pp. 250-273. Trilobites, pp. 264-65.

Alexander Bronginart and A. G. Demarest used the collection of the Museum in making up their celebrated work on Fossil Crustaceans in 1822.

The collection contains DeFrance's original of figs. 2f and 2g.

Calymmene Tristani, which is reproduced, Plate 1A Palæontologia Universalis, by M. Pompejck, in 1903.

The *Ogygia Guettardi* Brong. was reproduced by Oehlert in Palæontologia Univ.

Bolton (Herbert). On the occurrence of a Trilobite in the Skiddaw Slates of the Isle of Man.

Geol. Mag., Dec. iii, vol. 10, 1893, pp. 29-31.

Eglinia or *Asaphus*.

See also Mem. Geol. Sur. United Kingdom, The Geol. Isle of Man, 1902, p. 93.

Bigney (Andrew J.) A new bed of Trilobites.

Indiana Acad. Sci. Pro., 1910, p. 139-1911.

Records the discovery of *Calymmene* bed in Richmond formation.

Bolton (H.) On faunal horizons in the Bristol Coalfield.

Quart. Jour. Geol. Soc. London, vol. 67, p. 316, 1911, pl. 27.

Palæontological Notes, Ostracoda and Phyllopora, on p. 324.

The author figures the following species:

Estheria tenella Jordan, *Bairdia* cf. *amplex* Reuss, *Leaia Leidyi* Lea, var. *salteriana* Jones.

Bonnema (J. H.) Beiträge zur Kenntniss der Ostrakoden der Kuekerschen Schicht.

Mitteilungen aus dem Min. Geol. Inst., vol. 2, part 1, Leipzig, 1909, 84 pp. with 8 plates.

The author gives the literature of this family, and describes and figures the following genera and species:

Primitia Tolli nov. sp., *P. Molli* nov. sp., *P. dentifera* nov. sp., *P. rossica* nov. sp., *P. decumana* nov. sp., *P. Kuckersiana* nov. sp., *P. Kapteyni* nov. sp., *P. Esthonica* nov.

sp. *Primitiella Kuckersiana* nov. sp. *Tetradella Calkeri* nov. sp.; also *convexa* n. sp. et nov. var. *Ctenobolina carinata* Krause, *C. Kuckersiana* nov. sp. *Ceratopsis Schmidt* n. sp., *C. cornuta* Krause. *Strepula Kuckersiana* nov. sp., also var. *acuta*. *Ulrichia* cf. *hidens* Krause, *U. Kuckersiana* n. sp. *Macronotella Kuckersiana* nov. sp. *Bollia minor* Krause var., *Kuckersiana* nov. var., also var. *robusta*. *Bollia ornata* Krause, also var. *latimarginata* nov. var., *B. granulosa* Krause. *Entomis oblonga* Steusloff var., *Kuckersiana* nov. var., *E. variolaris* nov. sp., *E. obliqua* Krause var. *Kuckersiana* nov. var., *E. flabellifera* Krause, *E. quadrispina* Krause. *Cytherellina Ulrichi* nov. sp., *C. Jonesii* nov. sp., *C. Krausei* nov. sp., *C. Ruedemanni* nov. sp. *Leperditia* (Cypridina) *ovulum*, referred to *Primitia Tolli* n. sp. *Leperditia minuta* Eichw., referred to *Cytherellina Ulrichi* n. sp. *Beyrichia obliquejugata* Schmidt to *Ceratopsis* sp. *Beyrichia complicata* Salter, referred to *Tetradella Kuckersiana* n. sp., *B. stangulata* Salter to *Bollia minor* Kr. var. *Kuckersiana*, *B. strangulata* var., *B. Jones* to *Bollia ornata* Kr. or *Entomis*.

Bornemann (J. G.) Die Versteinerungen des Cambrischen Schichten systems der Insel Sardinien.

N. Act k. Leop. Carl d. Acad. d. Natur., vol. 56, No. 3, 1891.

Under the new generic name of *Olenopsis* the author includes a genus which differs from *Olenus* in the form of its small, rounded pygidium with an unjointed axis; the head is semicircular in front and not straight as in *Olenus*; it has also a conical smooth glabella, with 14 or 15 thorax segments.

The genus has been referred by Frech *Lethaea geognostica*, I Theil. *Lethaea palaeozoica*, 2 Bd., I Lieferung, p. 41, to *Olenellus* sub. genus *Holmia*.

The author describes *Olenopsis Bornemannii* n. sp., *O. Zoppi* Menegh., *O. longispinatus* n. sp., *O. micruroides* n. sp., and *O. maximus*.

Metadoxides torosus Menegh. n. gen. et sp.

This genus is similar to *Paradoxides* with numerous thoracic segments and a small pygidium. The head is short and wide; the front margin nearly straight; the glabella is similar to that of the *Olenidae*, and has three oblique furrows, which do not extend to the center.

Metadoxides armatus Menegh., *M. Bornemannii* Menegh., *M. arcuarius* n. sp.

Matthew, in Studies on Cambrian Fauna, No. 3, p. 87, classifies the genus *Metadoxides* as follows:

1—Species having a widely expanded front to the cephalic shield; somewhat prolonged eye lobes; short posterior extension of the dorsal suture. No costae on the side lobes of the pygidium.

Catadoxides n. subgen., type *C. magnificus* Matt.

2—Species having a compacted front to the cephalic shield, short eye lobes, prolonged posterior extension to the dorsal suture.

a—No costae on the side lobes of the pygidium.

Metadoxides sensu stricto, type *M. torosus*.

b—One or more pair of costae on the side lobes of the pygidium.

Anadoxides n. subgen., type *A. armatus*.

The following species are also included in Bornemann's paper:

Paradoxides Gennarii Menegh., *P. asper* n. sp., *?P. ingens* n. sp., *?P. bifidus* n. sp., *?Paradoxides* sp. *Olenellus solitarius* n. sp.

?Peltura inflata n. sp. *Ptychoparia laticops* n. sp., *?P. Adamsi* Bill., *P. enantiopa* n. sp. *Sao sarda* n. sp. *Meneghinella* n. gen., *M. serrata* n. sp.

The glabella has four cross furrows, with a center row of spines.

Arionellus ? dubius n. sp., *A. zancanthoides*. *Anomocare arcuivagum* Menegh. *Nesocretus ? discurus* n. sp. *Giordanelia* n. gen.

The species of this genus resembles in structure of the thorax those of *Illacnus*, from which they differ by the more arched axis, and the side spines of the pygidium.

Angelina differs from *Giordanella* in its flat head, and the margin around it; also in the size of its pygidium.

Giordanella Meneghinii Bormen., *G. dilatata* n. sp., *G. elongata* n. sp.

Boulay (M. L'abbé). Sur un nouveau genre de Trilobite dans le terrain. Houiller du nord de la France.

Ann. Sci. Bruxelles, 4 Anne, 1879-80, Memori, p. 277-280.

Under the new generic name of *Anthracopeltis*, the author describes and illustrates a pygidium as *Anthracopeltis Crepini*.

The pygidium resembles that of *Phaeton* Barrande, but may be distinguished by the shape of the axis, also by a groove which runs around the tail near the base of the spines.

Boule (M.) Sur des debris d'Arthropleura trouvés en France.

Bull. de la Soc. de l'Industrie Minérale, 3rd ser., tome 7, 4 livr, 1893, pp. 619-638, plates 54-55.

Brodie (P. B.) On the Passage beds in the neighbourhood of Woolhope, Herefordshire, and on the discovery of a new species of *Eurypterus* and some new Land plants in them.

Geol. Mag., Decade 1, vol. 8, 1871, p. 230.

The author describes as the passage beds between the Silurian and Old Red sandstone formation near Woolhope, a series of shales and sandstones. The Olive shales contain several crustacean fossils, including *Pterygotus Banksii*, and a new *Eurypterus* named by Henry Woodward *Eurypterus Brodiei*.

Branson (E. B.) The fauna of the residuary Auburn Chert of Lincoln County, Missouri.

Trans. Acad. Sci. of St. Louis, vol. 18, No. 4, 1909, pp. 39-49, pl. 7.

The author describes as new *Pterygomotopus Lincolnensis*, which differs from *P. eboreaceous* in the absence of genal spines, and slightly in the shape of the first lateral furrow of the glabella from *P. intermedius* Walc., which he figures on pl. 8, fig. 20.

Brögger (W. C.) Ueber die Verbreitung der Euloma Niobe Fauna.

Nyt. Mag. Natv., vol. 35, 1896, pp. 164-240.

The author refers to the new genus *Dikelokephanina*.

Centropleura dicracura Ang. *Dikelocephalus furca* Salt. *Asaphelina Barroisi* Mun-Chalm et Berg. and *Dictyocephalites Fillebruni* Berg., to this genus.

Under the new genus *Apatokephalus*, the author places *Tril serratus* S. & B. *Centropleura angusticauda* Ang. (probably a variety of *Apatokephalus serrata* Brögger, p. 21).

Dik. finalis Walc., *D. Schlotheimi* Bill. (*Remopleuridesi Schlotheimi* Bill., 1865.) *Dikelocephalus Magnificus Conocorphyhe invita*, Salter.

Bureau (L.) Notice geol. sur Loire Inférieure, 1900.

The author gives a fig. 23 of *Calymmene pulchra* Barr.

Bezier refers it to *Prionocheilus Verneuli* Rouault.

Burling (L. D.) The Albertella Fauna in the Middle Cambrian of British Columbia.

Am. Jour. Sci., 4th ser., vol. 42, 1916, p. 462.

Albertella Bosworthi and *A. Helena* Wal.

Burr (Henry T.) A new Lower Cambrian fauna from Eastern Massachusetts.

Am. Geol., vol. 25, 1900, pp. 41-50.

The fossils described from a red slate and impure limestone from North Weymouth, Mass.

Olenellus (Holmia) *bröggeri* Walc., *O. (Megganacis) asaphoides* Emm. *Olenellus* sp. *Metadoxides magnificus* Matt. *Agraulus (Strenuella) strenuus* Bill. var. *nasutus* Walc. *Microdiscus* cf., *M. Helena* Walc. *Leperditia* cf., *L. solitaria* Barr.

Burhenne (H.) Fauna d. Tentaculitenschiefer in Lahnggebiet bes d. Schiefer v. Leun bei Braunfels, 1899.

Proetus laevigatus and *granulosus*, pl. 1, fig. 1-6; *Proetus Holzapfeli* referred by Richter to *P. cornutus*.

Cyphaspis hydrocephala Roemer.

Calman (W. J.) On *Pleurocaris* a new Crustacean from the English Coal Measures.

Geol. Mag., Decade v, vol. 8, 1911, p. 156. Fig. in text.

Pleurocaris annulatus g. et sp. n.

The specimen is without a carapace, with at least 7 of the thoracic somites distinct and provided with horizontally expanded pleural plates; with at least 7 pairs of the thoracic appendages, not greatly differing in size; with the abdomen longer than the thorax; with the telson and uropods forming a tail fan—the former distinct from the last somite and tapering to a sharp point, the latter with long, narrow rami.

Acanthotelson Simpsoni Meek and Worthen

The author includes the genus in Syncarida allied to the genus *Acanthotelson* Meek and Worthen.

Calman (W. T.) On some Crustacea of the division Syncarida from the English Coal Measures.

Geol. Mag., Decade v, vol. 8, No. 11, 1911, pp. 488-495, figures 1-5.

The author regards the genus *Prianaspides* Woodward, as a synonym of *Palaeocaris* Meek and Worthen.

Figures and describes *Palaeocaris praeursor* H. Woodw., also *Palaeocaris typus* after Packard's figure of the species.

The author also gives some additional notes regarding *Pleurocaris annulatus*, with a figure of the restoration of dorsal surface of the head region.

Calvin (Samuel). Description of *Asaphus susac*. Calvin in MS.

Whitfield Geol. Wisconsin, vol. 4, p. 236, pl. 5, fig. 3, and pl. 10, fig. 8, from the Trenton Group.

——— Description of *Isotelus florencervillensis* n. sp.

Iowa Geol. Sur., vol. 13, 1902, p. 46, foot-note, from the Maquoketa or Hudson River shales.

This is the rather short and broad trilobite, with rounded cephalon and pygidium, which Clarke Geol. Pal., vol. 3, part 2, p. 708, referred to *Isotelus susae*.

Cardot (H.) and Legendre (R.) Nouvelles traces d'autotomie chez des Crustacés fossiles.

Bull. Mus., Paris, 1912, pp. 131-132.

Carruthers (William). Note on some supposed fragments of a Eurypteris in Dr. Henry Woodward's British Fossil Crustacea Merostomata.

Mon. Palaeont. So., pp. 168-71.

The author remarks that the specimens figured and described by Salter as portions of a Eurypteris, are fragments of a large Equisetaceous plant.

Chapman (Frederick). On a new species of Leperditia from the Silurian of Yaas, New South Wales.

Proc. Roy. Soc. Victoria, vol. 22, pp. 1-5, plates 1 and 2.

Leperditia shearsbii nov.

——— New or little known Victorian Fossils in the National Museum, Part XIV. On some Silurian Trilobites.

Proc. Roy. Soc. Victoria, vol. 24, 1912, pp. 293-300, plates 61-63.

The author describes:

Ampyx parvulus Forbes var. *Jikaensis* nov., *A. yarraensis* nov. *Illacnus jutsoni* nov. The Victorian species differs in ornamentation of the glabella from *Illacnus Davissi*. It has a narrow and rounded median ridge, extending along the summit of the glabella, tapering off into a mere thread before reaching the anterior margin.

Encrinurus (Gromus) spryi nov. *Homalonotus wormer* nov.

——— New or little known Victorian Fossils in the National Museum, Part XVIII. Some Yeringian Trilobites.

Proc. Roy. Soc. Victoria, vol. 28, 1915, pp. 157-171, plates 14-16.

The author includes eleven species of Trilobites in this paper:

Goldius greenii nov., which he compares with *Bronteus oblongus* Corda. *Goldius Cresswelli* nov. *Proetus euryceps* McCoy. *Cyphaspis Broeningensis* Mitchell, *C. Lilydalensis* nov. of the *Cyphaspis Burmeisteri* type, *C. yassensis* E. & M. *Calymmene angustior* nov.

Compares *C. tuberculosa* and other species.

The lateral riblets of the pygidium in *C. angustior* are furrowed or bifurcated distally, but in *C. tuberculosa* they are simple. *Calymmene Blumenbachi* Brong. Refers *C. duplicata* (Murch.) Jenkins, 1879, p. 27, pl. 6, fig. 4, to this species.

Cheirurus Sternbergi Boeck. *Phacops Crossleii* E. & M., *P. serratus* Foerste.

Chevillard (J. L.) Trilobites du Devonien du Mount de la Revenue.

Bull. Soc. Geol. de France, 2d ser., vol. 24, 1866-67, pp. 124-126.

Not descriptive.

The author remarks that *Phacops laevis* Münt. is very much like *Phacops cryptophthalmus* Emmrich.

Chmielewski (Czeslaw). Die Leperditien der obersilurischen Geschiebe des Gouvernement Kowno und der Provinzen Ost und Westpreussen.

Phys. ökonomischen Ges zu Königsberg, 1900, 37 pp., 3 plates.

The author describes the following species:

Leperditia Hisingeri Fr. Schmidt var., *angulata* Lebedew, *L. lithuanica* n. sp. and var. *intermedia*, *L. Dossi* n. sp., *L. Hisingeri* var. *abbreviata* Schmidt, *L. baltica* His., *L. phascolus* His. Stammform, *L. phascolus* His. var. *Angelini* Schmidt, also types and var. *lata* n. var., *L. phascolus* His. var. *ornata* Eichw., included under Group A.

His. Group B, includes *Leperditia gregaria* Kiesow and var. *coccinnella* n. var., *Leperditia gregaria* var. *tumulosa* n. var. and var. *conoidea* n. var. with var. *scimgalliensis* n. var. *Leperditia Schellwieni* n. sp., *L. gigantea* Roemer and var. *Poniezwieshensis* n. var. *Leperditia* sp. cf. *tyraica* Schmidt. *Leperditia Keyserlingi* Schmidt and *L. baltica* var. *Eichwaldi* Schmidt.

Clarke (J. C.) Relation of the Paleozoic Arthropods to the Strand-line.

Bull. Geol. Soc. America, vol. 22, No. 2, pp. 279-280, 1911.

Clarke (John M.) Notes on some Crustacea from the Chemung Group of New York.

49th Ann. Report N. Y. Museum, vol. 11, 1895, pp. 729-738.

Pephicaris horripelta n. gen. et sp. *Bronteus serescens* n. sp.

——— The straggraphic and faunal relations of the Oneonta sandstone and shales, the Ithaca and Portage Groups in Central New York.

49th Ann. Report N. Y. Museum, vol. 11, 1895, Part 2, p. 69, fig.

Rhinocaris ? bipennis n. sp.

——— Upper Silurian fauna of the Rio Trombetas, State of Para, Brazil, and Devonian Mollusks from the State of Para.

Archiv. Mus. Nacional, Rio de Janeiro, vol. x, 1899.

Primita minuta, Eichw. *Bollia lata*, Vanuxem.

Rhinocaris Columbina

——— *Eucrustacea* (pars) *acerta*.

Text Book of Palaeontology by A. von Zittel. Translated by Charles R. Eastman, London and New York, 1900, pp. 639-658.

——— The Oriskany fauna of Becraft Mountain, Columbia Co., New York.

Memoirs New York State Museum, vol. 3, No. 3, Albany, 1900, 9 plates.

Dalmanites (*Synphoria*) *stemmatus* n. sp., *D. (Synphoria) stemmatus* var. *convergens* n. var. *D. phacoptyx* H. and C., *D. bisignatus* n. sp. *Phacops correlator* n. sp., *P. Logani* Hall. *Cordania becraftensis* n. sp., *C. Hudsonica* n. sp. *Cyphaspis minuscula* Hall. *Proetus Conradi* Hall. *Acidaspis tuberculata* Conrad. *Lichas* cf. *pustulosus* Hall. *Homalonotus* sp. *Beyrichia* sp.

——— Appendix 3. Notes on Palaeozoic Crustaceans. The genus *Pseudoniscus* in the *Eurypterus* beds below and above the Gypsum and Salt beds of the Salina stage in New York.

Ann. Report State Palaeontologist, 1900.

Pseudoniscus Roosevelti n. sp.

CLARKE (J. M.)—Continued.

——— Phyllocardia from the Black shales at the base of the Salina beds in Western New York.

Ann. Report State Palæontologist, 1900, pp. 92-110.

Ceratiocaris (Limnocris) praeceus n. sp. *Emmelezoe decora* n. sp.

——— The occurrence of the Phyllopod Crustacean *Estheria membranacea* of the Old Red Sandstone of Northern Scotland and North-western Russia in the Oneonta.—Catskill sediments of Eastern New York.

Ann. Report State Palæontologist, 1900, pp. 103-110, plate 4.

Estheria Ortoni n. sp.

——— Limestone of Central New York interbedded with bituminous shales of the Macellus, with notes on the nature and origin of their faunas.

Bull. N. Y. Museum, vol. 49, 1901, pp. 115-138, plate 8.

Not descriptive. List of Fossil Crustacea.

——— and Ruedemann (R.) Guelph fauna in the State of New York. N. Y. State Museum, Mem. 5, 1903.

The authors describe and illustrate *Lepiditella balthica* Hisinger var. *guelphica* Jones. *Calymene niagarensis* Hall; also a species of Dalmanites and Proetus.

——— Percé: A brief sketch of its geology.

Bull. New York Mus., No. 80, pp. 134-171, 1905.

Represents an incomplete cephalon of *Dicranurus limenarcha*, on p. 153.

——— some new Devonian Fossils.

Bull. 107, N. Y. State Mus. Geological Papers, 1907, pp. 153-291.

Trilobites: *Dalmanites griffoni* n. sp., fig., *D. coxius* n. sp., fig., *D. dolbeli* n. sp., fig., *D. Lowi* n. sp., fig., *D. perceus* n. sp., fig., *D. Feiti* n. sp., fig., *D. Whiteavesi* n. sp., fig., *D. Gaveyi* n. sp., fig., *D. ploratus* n. sp., fig., *D. (Probolium) Bairdi* n. sp. fig., *D. (Probolium) Esnoufi* n. sp., fig. *Phacops Loganii* var. *gaspensis* n. sp., fig., *P. (Phacopidella) Mylanderi* n. sp., fig. *Bronteus Barrandii*, Hall, var. *major*, fig. *Lichas (Gaspelichas) forillonii* n. sp., fig., *L. bellamicus* n. sp., fig. *Ceratocephala robinia* n. sp., fig. *Cordania gasepion* n. sp., fig.

——— The Eurypterid shales of the Shawangunk Mountains in Eastern New York.

Bull. 107, N. Y. State Mus. Geological Papers, 1907, pp. 295-310, 8 plates.

Eurypterida: *Eurypterus maria* n. sp., *E. myops* n. sp., *E. ? cicero* n. sp., *E. ? cestrotus* n. sp.

Genus *Hughmilleria* H. *shawangunk* n. sp.

Genus *Pterygotus* P. ? *otisius* n. sp. *Stylonurus* sp. Phyllocardia.

——— Early Devonian History of New York and Eastern North America.

N. Y. State Mus., Men. 9, pt. 1, 366 pp., 48 plates, 1908.

Fauna of the St. Alban beds; *Phacops logani* Hall. *Dalmanites griffoni* nov., *D. coxius* nov. *Bronteus barrandii* Hall. *Cordania cyclurus* Hall and Clarke.

CLARKE (J. M.)—Continued.

Fauna of the Grade Greve Limestones. *Phacops logani* Hall and var. *gaspensis* nov. *Dalmanites micrurus* Green, *D. dolbeli* nov., *D. lowi* nov., *D. veiti* nov., *D. Whiteavesi* nov., *D. percerensis* nov., *D. emarginatus* Hall, *D. gazei* nov., *D. (Probolium) bairdi* nov., *D. (P.) esnoufi* nov., *D. phacoptyx* H. & C.

Proetus phocion Billings. *Cordania becraftensis* Clarke, *C. gasepion* nov. *Lichas bellamicus* nov. *Lichas (Gaspelichas) forillonii* nov. *Ceratocephala robinia* nov. *Aparchites* nov. *Bythocypris* sp. nov. *Phacops (Phacopidella) correlator* Clarke.

——— Early Devonian History of New York and Eastern North America.

N. Y. State Mus., Mem. 9, part 2.

The author illustrates *Dalmanites micrurus* Green *Proetus* sp. *Bronteus Barraudii* Hall, *Pterygotus* sp. from the Dalhousie Beds.

From the Moose River sandstone the following Crustacea:

Homalonotus cf. *vanuxemi* Hall. *Dalmanites pleuroptyx* Green, *D. ploratus* Clarke *Dalmanites* sp.

From the Chapman sandstone: *Phacops (Phacopidella) mylanderi* Clarke. *Homalonotus vanuxemi* Hall. *Dalmanites* cf. *micrurus* Green.

New York Oriskany *Dalmanites emarginatus* Hall.

——— and Ruedemann (Rudolf). Mode of life of the Eurypteridae. Science, new ser., vol. 32, p. 224, Aug. 12, 1910.

——— and Ruedemann (Rudolf). The Eurypterida of New York.

Memoir 14, New York State Museum, vol. 1, Text vol. 2, plates, 1912, 638 pp., 88 plates, 121 text figures.

Reviewed in Am. Jour. Sci., vol. 35, No. 298, 1913, p. 458.

The reviewer remarks (Schuchert): "It is truly a monumental work and a model for all palæontologists to follow."

In this work one can study Eurypterida from any view point permitted the palæontologist. Here we find their chronology, their development from baby stages, prophetic of unknown ancestors, to adults; and their relations to scorpions, horseshoe crabs, Trilobites and even to hypothetic annelids.

The authors illustrate in text and plates the following species:

Strabops thacheri Beecher.

Eurypterus.

The American species of Eurypterus readily fall into three subdivisions:

(A) Those that group themselves around *E. remipes*.

(B) Those that vary in different directions from this group, but are approximately contemporary—*E. Dekayi*, etc.

(C) The later Carbonic species.

Under this genus the authors describe:

Eurypterus remipes DeKay, *E. lacustris* Harlan, *E. lacustris* Hall var. *pachychirus* Hall, *E. DeKayi* Hall, *E. maria* Clark. This species differs from American congeners, due to the terete form of the body that apparently is without preabdominal expansion.

Eurypterus pygmaeus Salter differ but slightly. *Eurypterus megalops* nov., *E. microphthalmus* Hall. The authors refer *E. eriensis* Whitfield, to this species. *Eurypterus pittsfordensis* Sarle, *E. (Dolichopterus?) prominens* Hall, *E. pustulosus* Hall. Authors refer *E. giganteus* Pohlman and *E. globicaudatus* Pohlman to this species. *Eurypterus pristinus* nov., *E. ranllarza* nov., *E. ? (Dolichopterus?) stellatus* nov., *E.*

CLARKE (J. M.) and RUEDEMANN (R.)—Continued

(*Onychopterus*) *Kokomoensis* Miller and Gurley. This is subgenus proposed for this species.

The authors classify *Eurypterus Boylei* Whiteaves under a new subgenus *Tylopterus*.

Eurypterus (Anthraconetes) mazonensis Meek and Worthen. *Eusarcus* Grote and Pitt. *Eusarcus scorpionis* Grote and Pitt. The authors refer *E. grandis* G. & P. to this species. *Eusarcus newlini* Claypole. The authors refer *Eurysoma newlini* and *Carcinosoma newlini* Claypole to this species. *Eusarcus ? cicerops* Clarke, *E. ? longiceps* nov., *E. triangulatus* nov. *Dolichopterus macrochirus* Hall, *D. frankfortensis* nov., *D. latifrons* nov., *D. otisus* Clarke, originally described under the genus *pterygotus*; *D. siluriceps* nov., the *Eusarcus scorpionis* Pohlman, 1886, *D. testudineus* nov., *D. stylonur-oides* nov.

Genus *Stylonurus* Page The authors illustrate *S. elegans* Laurie and *S. logani* Woodward, also *S. macrophthalmus* Laurie. They divided the genus into subgenera.

(A) *Stylonurus* type *S. logani* Woodward, etc.

(B) *Ctenopterus* type *Stylonurus cestrotus* Clarke, etc.

(C) *Tarsopterus* type *S. scoticus* Woodward.

Stylonurus (Ctenopterus) excelsior Hall.

The author refers *Dolichocephala lacoana* Claypole, 1883, and *S. lacoanus* Beecher, 1900, to this species.

(*Drepanopterus*) type *S. lobatus* Laurie.

Stylonurus limbatus nov., *S. (Ctenopterus) multispinosus* nov., *S. myops* Clarke. *Stylonurus beecheri* Hall, described as *Eurypterus beecheri*, Hall, 1884; *S. wrightianus* Dawson, described as *Equisetides wrightiana* Dawson, 1881. Subgenus *Drepanopterus* Laurie. The authors figure *D. pentlandicus* Laurie, *D. longigaudatus* nov.

Echinognathus Walcott, *E. clevelandi* Walcott.

Megalograptus Miller, *M. welchi* S. A. Miller. This was described as a Graptolite by Miller, 1874.

Family *Pterygotidae*:

Genus *Hughmilleria* Sarle, 1902, *H. socialis* Sarle and var. *robusta*, *H. magna* nov., *H. shawangunk* Clarke.

Pterygotus Agassiz:

The authors figure a restoration of *Stylonurus porwiceii* and *Pterygotus angelicus*, fig. 70. Describe and illustrate *Pterygotus macrophthalmus* Hall, to which they refer *P. osborni* Hall, *P. atlanticus* nov., *P. buffalocensis*, Pohlman emend. The authors refer *P. cummingsi* Grote and Pitt, 1877, *P. acuticaudatus* Pohlman, 1881, *P. quadraticaundatus* Pohlman, *P. macrophthalmus* Pohlman, 1881, and *P. bilobus* (Huxley and Salter) Pohlman, 1881, to this species. *Pterygotus cobbi* Hall, *P. (Erettopterus) globiceps* nov., *P. (Erettopterus) gaudis* Pohlman emend.

This is the *Ceratiocaris grandis* Pohlman, 1883, *P. monroensis* Sarle, *P. (Eusarcus) nasutus* nov., *P. prolificus* nov.

Remarks on *Beltina danai* Walcott.

The authors are not convinced that the fragments of this genus described are those of *merostomatus*.

Note on *Proscorpius osborni* Whitfield.

Stylonurus Logani Woodward

CLARKE (J. M.) and RUEDEMANN (R.)—Continued

The authors remark that *Eusarcus* and the Siluric scorpions are so much alike in their body form, they may be assumed to have had similar habits.

The genus *Hastimima* White, 1909.

This genus was established for a few carbonic plants from Brazil. Seward, 1909, and Woodward refer similar fragments to the Eurypteridae. The authors give figures of *Hastimima whitei*.

Note on *Sidneyia inexpectans* Walcott.

The authors remark that the suborder Limulaya differs from the Eurypteridae, to which it is most nearly related, in having a large epistoma similar to that of the Trilobita.

Eurypterids from the Normanskill shale of New York.

Eurypterus chadwicki nov. *Eusarcus linguatus* nov. *Dolichopterus breviceps* nov. *Stylonurus modestus* nov. *Pterygotus (Eusarcus) nasutus* nov., *P. normanskillensis* nov.

The authors give notes on the Eurypterids from the Shawangunk grit of the Delaware Water Gap, Pennsylvania, and describe as new *Eusarcus xanigeni* from the Salina formation.

Notes on Anthraconectes.

The authors investigated the types of C. E. Hall and James Hall, Pennsylvania Carboniferous species, now in Chicago Univ., and make some notes on *Eurypterus (Anthraconectes) mansfieldi* C. E. Hall, *E. pennsylvanicus* C. E. Hall.

The volume closes with a note and figure on the ventral surface of the cephalothorax of *Hughmilleria*, and a note on *Pterygotus Cobbi* var. *juvenis* nov.

——— A notable Trilobite from the Percé rock.

New York State Museum Bull. 164, 1913, p. 138.

The author illustrates Plate A. *Homalonotus perccensis*.

——— Illustrations of the Devonian fossils of Southern Brazil and the Falkland Islands.

New York State Museum Bull. No. 164, 1913, p. 140.

The author illustrates the following Trilobites:

Homalonotus noticus Clarke, *H. (Schizopyge) parana* Clarke, *H. herscheli* Murch. *Dalmanites acacia* Schwarz.

Calmonia new genus, *C. ocellus* Lake, *C. subseciva* Clarke, *C. signifer* and variation, *micrischia* Clarke. *Proboloides* new genus, *P. cuspidatus* Clarke and *P. pessulus* Clarke.

Pennaia new genus, *P. pauliana* Clarke. *Cryphaeus allardyceae* Clarke, *C. australis* Clarke. *Dalmanites falklandicus* Clarke, *D. accola* Clarke. *Homalonotus perccensis* Clarke.

——— Fosséis Devonianos do Paraná.

Service Geol. E. Mineralogico do Brazil, vol. 1, 1913.

The author illustrates and describes the following Trilobites:

Homalonotus noticus nov. (a Falkland Island species), *H. Herscheli* Murchison, *H. (Schizopyge) parana* nov. *Dalmanites accola* nov., *D. falklandicus* nov., *D. sp. Cryphaeus australis* nov., *C. allardyceae* nov., *C. sp.*

Group Mesembria—*Dalmanites acacia* Schwartz.

This is the *Phacops crista galli* Lake, 1904, which Schwartz Record, Albany Mus., 1906, refers to *Phacops acacia*. *Dalmanites africanus* (Salter) Lake.

Calmonia gen. nov. type, *C. signifer* nov.

In 1889 Oehlert introduced the name of *Cryphina* as a generic name for a Devonian species for a triangular, highly convex dalmanitid pygidium, having a series of five or more broad, closely appressed small spines on each side. Similar forms described for

CLARKE (J. M.)—Continued.

New York Devonian as *Dalmanites concinna* var. *serrula* in 1888, and referred to *Cryphina serrula*.

The author in view of the known variation between *Cryphaeus* and *Hausmannia* places the new genus with a caudal extension in his new genus. The head differs from that of *Cryphaeus*. The author describes in addition to the type *Calmonia signifer* var. *micrischia* nov., *C. subseiva* nov. and *C. ocellus* Lake, described by Lake under the genus *Phacops* from South Africa. *C. ? gonzana* Clarke.

Pennaia new genus type, *P. pauliana* nov.

A very distinct variation of the Mesembria type of *Dalmanites* is expressed by *Pennaia pauliana*. In general aspect it is distinctly more Phacopidean than *Calmonia*, in respect: first, to the head, in which all parts are more compact and condensed; second, in the thorax, where the axis is relatively much broader than the side lobes, while the ends of the anterior segments are rounded rather than lanceolate; third, in the pygidium, which is phacopidean in its small size and sparse segmentation. The margin of the pygidium is fimbriate, bearing three flattened spinules on each side.

Proboloides gen. nov. type, *P. cuspidatus* and *P. pessulus* nov.

In the possession of a frontal snout on the head this species is a *Probolium* after the type of snouted *Dalmanitids*, but in respect to the character of the snout, the form of the cephalon, its style of lobation and smoothness of surface, it departs from the type and is an expression of the Mesembria structure.

The author proposed the term *Phacopina* in place of *Phacopidella*, which Reed uses for *Acaste*, a preoccupied term.

——— and Swartz (Charles K.) *Trilobita*.

Geol. Sur. Maryland Upper Devonian, Baltimore, 1913, p. 699.

Phacops rana Green, 1832.

——— Report of Director, 1913.

New York State Mus. Bull. 173, 1914.

Restoration of *Pterygotus buffaloensis*, also of *Eusacus* and that of *Stylonurus excelsior*.

Cleland (Herdman F.) Further notes on the Calciferous (Beekmantown) formation of the Mohawk Valley, with descriptions of new species.

Bull. Am. Palæontology IV, No. 18, 1903, pp. 37-50, plates.

Bathyrus ellipticus nov. sp. *Harrisia parabola* nov. sp.

Crossmann Rev. Crit. Palæont., replaces the preoccupied named of *Harrisia* to that of *Clelandia*.

———The fossils and stratigraphy of the Middle Devonian of Wisconsin.

Wisconsin Geol. and Nat. Hist. Sur. Bull. 21, 1911, Chapter X, Crustacea.

The Middle Devonian formation in Wisconsin has yielded very few crustacean remains. The most widespread trilobite is *Phacops rana*.

The author describes and illustrates *Proctus Rozzi* Green. *Phacops rana* Green. *Proctus crassimarginatus* Hall.

Ostracoda: *Bollia ungula* Jones. *Barychilina walcotti* Jones. *Kirkbya subquadrata* Ulrich. *Ulrichia conradi* Jones.

Phillopocarida: *Echinocaris punctata* Hall, and *Tropidocaris* sp.?

——— A study of the fauna of the Hamilton formation of Cayuga Lake section in central New York.

Bull. U. S. Geol. Sur., No. 206, 1903, 112 pp., 5 plates.

The author gives a list of Crustacea on pp. 79-81, with notes on their occurrence.

Cobbold (E. S.) On some small Trilobites from the Cambrian Rocks of Comley, Shropshire.

Quart. Jour. Geol. Soc., vol. 66, No. 261, pp. 19-50, plates 3-8.

Microdiscus comleyensis n. sp.

This species appears to be somewhat intermediate between *M. speciosus* Ford and *M. punctatus* Salter, but only has 7 annulations in the axis of the pygidium.

Microdiscus lobatus Hall, *M. Helena* Walcott, *M. speciosus* Ford. *Ptychoparia* ? *Attleboroughensis* Sh. and F., *P. ? annio* n. sp. *Micmacca* ? *ellipsocephaloides* n. sp. cf., *M. recurva* Matthew. *M. ellipsocephaloides* var. *Spinora* and var. *strenuoloides* and var. *senior*, *M. ? parvula* n. sp. *Agraulos (Strenuella) salopiensis* n. sp. *Anomocare platycephalum* n. sp., *A. parvum* n. sp., *A. ? pustulatum* n. sp. *Protolenus latouchi* n. sp., *P. morpheus* n. sp. *Mohicana* n. gen.

This new genus has characters very similar to those of *Micmacca* ? *plana* Matthew, which that author referred provisionally to his genus.

Mohicana lata n. sp., *M. clavata* n. sp.

The author remarks these two species have many points of resemblance with *Micmacca* ? *plana* Matthew, also with *Avalonia manuelensis* Walcott; but the peculiar groove on the line of the ocular ridge are absent, and the frontal limb is more extended.

——— Report of the Geological Excavation Committee of the British Association, read at the Dublin Meeting, 1908.

Rep. Brit. Assoc., 1908, Dublin, 1909, pp. 241-42.

Microdiscus sp. *Anomocare* cf. *Agraulos strenuus* var. *nasutus* Walc. *Anomocare* sp. 1 and 2, also 3, *Anomocare* vel. *Agraulos* sp. *Protolenus* sp.

——— Trilobites from the Paradoxides beds of Comley, Shropshire.

Quart. Jour. Geol. Soc. London, vol. 67, No. 267, 1911, pp. 282-311, plates 23-26.

The author describes *Paradoxides Groomi* Lapworth from the type specimen, and figures it for the first time; also *Paradoxides* sp. indet., *P. Davidis* Salter, *P. rugulosus* Corda. *Conocoryphe emarginata* Linnarsson var. *longifrons* nov. *Dorypyge Lakei* sp. nov. This species is nearly allied to the pygidia of *Dorypyge oriens* Grönwall.

The species might be compared with *Dikellocephalus Marcoui* (Whitfield) from Georgia, Vermont; see, also, Walcott's figures of this species.

Agnostus fallax Linnarsson, *Microdiscus* sp. cf., *M. punctatus* Salter. *Agraulos holocephalus* Matth., *A.* sp. cf., *A. quadrangularis* Whitf.

The author follows Reed's classification of the genus *Ptychoparia* Corda, and places the genera *Ptychoparia Liostracus* and *Conoccephalites*, under subgenera to *Ptychoparia*.

The author describes *Ptychoparia (Liostracus) pulchella* sp. nov., nearly related to *Liostracus validus* Matth. and *L. Linnarssoni* Brögger, but differ from both in the relative length of the glabella. *Ptychoparia (Liostracus)* sp. ident. two forms and *P. (Liostracus) dubia* sp. nov.

——— The Trilobite fauna of the Comley Breccia-Bed, Shropshire.

Quart. Jour. Geol. Soc., vol. 59, No. 273, pp. 27-50, plates 2 and 3.

The author describes and illustrates *Paradoxides intermedius* nov.

The species differs but slightly from *P. Hicksii*, its var. *palpebrosus* Linnarsson and *P. Sjögreni* in the course of the facial suture and general form.

Agraulos sp. cf., *A. Quadrangularis* Whitfield. Subgenus *Strenuella (Agraulos)* sp. indet. *Conocoryphe aequalis* Linnrs., *C. bufo* Hicks. subgenus *Liocephalus impressa* Linnrs. *Dorypyge reticulata* nov.

The cranidia of *D. Lakei* is very much like the new species, but the thorax and pygidia are different, and the reticulate character of the test very distinctive.

Microdiscus punctatus Salter. *Ptychoparia (Liostracus) lata* nov.

The species is related to *P. valida* Matthew and *P. Linnarssoni* Brögger. *Ptychoparia (Liostracus) dubia* Cobbold.

Cole (A. J.) On *Belinurus killorkensis* Bailey.

Geol. Mag., Decade 4, vol. 4, 1901, pp. 52-54, figures.

Collie (George). Lower Ordovician section, near Bellefront.

Bull. Geol. Soc. Am., vol. 14, 1903, pp. 407-420, plate 59.

Brongniartia Trentonensis Simpson.

The generic name of *Brongniartia* was used as a subgenus to *Homalonotus* by Salter in 1865; also by Green Mong. Tril., 1832, for a species of *Homalonotus*; and by Eaton, Am. Jour. Sci., vol. 22, 1832, p. 165, for what is now known as *Triarthrus Beckii* Green.

The author also describes *Encrinurus tuberculosis* nov. sp.

Crosfield and Skeat. On the Geology of the neighborhood of Car-mathen.

Quart. Jour. Geol. Soc. London, vol. 52, 1896, p. 523.

Peltura punctata nov. sp. *Parabolinella* sp. and *Ogygia marginata* nov. sp.

Crossman (M.) Revue Critique Paléontologie, 1902, sixieme Ann., p. 52.

Redlichia nov. gen.

The author uses this term to replace *Haeferia*, Redlich, Tril., 1899, non Bittner Moll., 1895.

Cumings (E. R.) The Stratigraphy and Palaeontology of the Cincinnati series in Indiana.

32 Ann. Report Geol. and Natural Resources of Indiana, 1908, pp. 605, 1188, 55 plates. The Ostracoda and Trilobites are figured on pls. 53-55.

Ostracoda: *Bollia pumila* Ulrich. *Ceratopsis Chambersi* Miller and var. *robusta* Ulrich, *C. oculifera* Hall. *Ctenobolina ciliata* var. *Hammeli* M. & F. *Eutomis Madisonensis* Ulrich, *Eurychilina striatonarginata* Miller. *Leperditia caecigena* Miller. *Primitia cincinnatiensis* Miller, *P. impressa* Ulrich. *Tetradella quadrilirata* H. & W., also var. *simplex* Ulrich. *Lepidcolenus Jamesi* H. & W.

Trilobites: *Acidaspis ceralepta* Anthony, *A. cincinnatiensis* Meek, *A. crosotus* Locke. *Calymmene calicephala* Green. *Ceraurus pleurexanthemus* Green, *C. icarus* Billings. *Dalmanites breviceps* Hall. *Isotelus maximus* Locke. *Proetus spurlocki* Meek. *Trinucleus concentricus* Eaton.

Referred to *Cryptolithus tessellatus* Foerste, Bull. Sci. Denison Univ., 1910, vol. X, p. 78.

Dahmer (G.) Ein Hautungsplatz von *Homalonotus gigas* A. Roemer im linksrheinischen Unterdevon.

Jahrb. des nass. Vereins für Naturkunde 67, 1914, plates 2 and 3.

Homalonotus gigas.

Delgado (J. F. N.) Fauna Cambrienne du Haut Alentejo.

Geol. du Portugal, vol. V, 1904, 6 plates.

In the description of fossils, p. 318, the author describes *Paradoxides Choffati* nov.; also *P. aff. abenacus* Matth. var., ? *P. aff. spinosus* Boeck, *P. costae* nov. and *P. aff. Tessini* Brong. *Olenopsis* sp. *Hypostoma* of *Olenollus*?

The new genus *Hicksia*, founded on a group of species resembling *Conocoryphe humerosa* Salter.

It has the tumid cheek and galbella of *Solenopleura*, with the smooth test of *Liostracus*, but the glabella narrows in rear and the pygidium is smaller.

He includes 9 new species under the genus: *Hicksia elvensis*, *H. sphaerica*, *H. Trans-tanensis*, *H. Walcottii*, *H. Castroi*, *H. Hughesi*, *H. Barroisi*, *H. Devalquei* and *H. minuta*.

Metadoxides Bornemannii, *Olenellus* ? *Macphersoni* nov. *Microdiscus caudatus* nov., *M. subcaudatus* nov., *M. Wenceslasi* nov., *M. Souzai* nov. and *M. Woodwardi* nov.

I would suggest the generic name of *Delgadoia* for these species, with eyes and three thorax segments, also with caudal spines.

Drevermann (Fritz). Die Fauna der oberdevonischen Tuffbrücke von Langenauabach bei Haiger.

Jahrbuch d. K. preuss. Geol. Landesanstalt für, 1900, pp. 99-207, 9 plates.

The author describes and illustrates:

Phacops cryptophthalmus Emm., *P. granulosus* Münster, *P. caccus* Gurich, *P. sulcatus* nov., *P. brevissimus* nov., *P. cf. mastophthalmus* Richter, *P. (Trimerocephalus) anophthalmus* Frech, *P. (T.) Lotzi* nov., *P. (Trim.) miserrimus* nov. *Proctus carinthiacus* nov., *P. dillensis* nov. *Dechenella* sp. ? *Bronteus cf. granulatus* Goldf.

——— Ueber eine Vertretung der Etroemgt-Stufe auf der rechten Rheinseite.

Zeitschr. d. Deutsch. Geol. Ges. 54, pp. 480-524, pl. 14, 1904.

Brachymetopus sp. and *Phillipsia* sp.?

Diener (Carl). The Permocarboniferous Fauna of Chitichun, No. 1.

Memoirs Geol. Sur. of India, Palæontologia Indica, Ser. xv, vol. 1, pt. 3, 1897, p. 105, plate 13.

Cheiropyge nov. gen., *C. Himalayensis* nov. sp.

The genus was proposed for certain Trilobites from the Carboniferous or Permian rocks in which the 6 pleural ridges and 15 axial rings of the pygidium extended beyond the border, such as *Phillipsia lodicensis* Meek and *Dalmanites Cuyahogae* Clappole.

A similar fossil to *Cheiropyge* was made into a new genus by Girty under the term of *Anitopyge*.

This author does not compare *Phaethonides spinosus* Herrick, Bull. Denison Univ., vol. 4, pl. 1, fig. 4, with 14 axial lobes and 9 pleurae.

The author also describes *Phillipsia Middlemissi* nov. sp., which the author compares with certain British Trilobites such as *P. Cliffordi*, etc.

Diener (Carl). Anthracolithic Fossils of Kashmir and Spiti.

Memoirs Geol. Sur. India, Palæontologia Indica, Ser. xv, vol. 1, pt. 2, 1899.

Phillipsia sp. ind. aff. *seminifera* Phillips.

This species which was figured by Lydekker, Mem. Geol. Sur. of India, vol. 22, pl. 2, figs. 5, 5a, may be congeneric with the European species, but the state of preservation of the latter is too indifferent to warrant an exact determination. An Australian species, *Griffithides dubius* Etheridge, is closely allied to the present one.

Dowling (D. B.) Report on a Survey of the Ekwan River and of the Route through Sutton Mill Lake Northward.

Geol. Sur. Canada, Ann. Report, n. ser., vol. 14, 1901, F.

Crustacea, p. 57 F: *Calymene Niagarensis* Hall, *Iliaenus* sp. *Bronteus Ekwanensis* nov. sp., *B. aquilonaris* nov. sp., *B. Niagarensis* Hall. *Ceraurus Tarquinis* Billings.

The Appendix I to this paper was edited by J. F. Whiteaves, pp. 38-60, therefore the new species of *Bronteus* described from the pygidia should be credited to Whiteaves.

Dufet (Henri). Notes sur les déformations des fossiles contenus dans les roches schisteuses et sur la détermination de quelques espèces du genre *Ogygia*.

Ann. de l'Ecole Normale supérieure, 1875, pp. 183-190, 2 figures.

Ogygia Edwardsi Rouault, *O. Brongniarti* Rouault, *O. Guetardi* Rouault, *O. Delesii* nov. sp. figures the pygidium.

The new species has 5 axial rings, 8 side ribs and a pointed tail.

Eastman (Charles R.) Text book of Palaeontology, adopted from the German of Karl A. von Zittel.

Second edition, vol. 1, 1913, 839 pp., 1594 figures.

Edgell-Wyatt (H. A.) On a new *Lichas* and other new forms from the Llandelilo Flags.

Geol. Mag., Decade 1, vol. 3, 1866, pp. 160-163.

Lichas partriarchus nov. sp.

Most of the Swedish *Lichas* are distinguished from it by the incompleteness of the first pair of glabella furrows.

Ellis (G. L.) and Salter (I. I.) The highest Silurian rocks of the Ludlow Dist.

Quart. Jour. Geol. Soc. London, vol. 62, 1906, pp. 195-227, Geol. Map.

List of Ludlow fossils.

Etheridge (Robert, Jr.) The largest Australian Trilobite discovered. Proc. Roy. Soc. Victoria, vol. 6, 1894, new ser., pp. 187-194, plate.

Bronteus enornis nov. sp.

—— Evidence of the existence of the Cambrian fauna in Victoria.

Roy. Soc. Victoria, 1895, pp. 52-64, plate.

Dinesus Ida n. gen. et sp.

The glabella has pyriform basal lobes; the bifurcating grooves near the anterior portion outline triangular lobes, on each side of the glabella. Pygidium ending in 5 or 6 short spines.

—— Official Contributions to the Palaeontology of South Australia, No. 9.

On the occurrence of *Olenellus* in the Northern Territory.

South Austr. Parl. Papers, 1897, No. 1353, pp. 13-16, plate 1, fig. 1.

The author describes *Olenellus Brozvnii* n. sp., which agrees with the Swedish *O. Kjerulfi* Linnrs. He doubts the presence of facial sutures in the genus.

Peach lays great stress on the non-detection of the facial suture in *Olenellus* as proving that the *Olenelli* had no free cheek, and should therefore be separated from the Trilobita.

Quart. Jour. Geol. Soc., vol. 48, 1892, p. 242.

—— Additions to the Cambrian fauna of South Australia.

Trans. Roy. Soc. S. Australia, vol. 29, pp. 246-251, 1905.

Olenellus sp.

ETHERIDGE (Robert, Jr.)—Continued

——— A further Cambrian Trilobite from York Peninsula.

Trans. Roy. Soc. S. Australia, vol. 22, 1898, pt. 3, plate IV.

Ptychoparia Howechini n. sp.

Woodward in 1884 described two Cambrian Trilobites from the Yorke Peninsula as *Dolichometopus Tatei* and *Conocephalites australis*. Tate has also described from the same District *Olenellus Prichardi* and *Microdiscus subsagittatus*, in Trans. R. Soc. S. Austr., 1892, XV, pl. 2, p. 187.

——— Additional Notes on the Palaeontology of Queensland. Part 1, Palaeozoic.

Proc. Linn. Soc. New South Wales, vol. 9, 1894, p. 528, pl. 39, fig. 3.

Griffithides Sæveti Eth. fil. MS.

This is an abnormal form departing both from *Phillipsia* and *Griffithides* in possessing 10 instead of 9 thoracic segments, and in the presence of the supplementary basal lobes on the glabella. The supplementary lobe to the glabella is present in some Proeti, such as *Proctus bohemicus* Corda. Burmeister has classed such species under *Eonia*, but McCoy's *Forbesia* had anticipated him by a few months.

——— The Trilobite *Illaenus* in the Silurian rocks of New South Wales.

Records Geol. Sur. N. S. Wales, vol. 8, p. 319, figs. 1-2.

Illaenus Johnstoni Eth. fil.

The original description. Tasmania Report Sec. for Mines for 1895-96, pl. fig. 3, page XLIII.

Two species of *Illaenus* have been recorded from the Silurian rocks of Australia. DeKoninck refers one to *Illaenus Wahlenbergianus* Barr., and the other from Tasmania was referred to this new species.

——— Trilobite remains collected on the Florentine Valley, West Tasmania, by Mr. T. Stephens.

Records of the Austr. Mus., vol. 5, part 2, 1904.

The author describes and figures the pygidium of *Niobe* sp. ind.; also that of *Dicelcephalus Florentinensis* Eth. fil., plate 10, figs. Walcott refers this to the genus *Dikelecephalina* Brögger.

——— Additions to the Cambrian fauna of South Australia.

Trans. and Proc. Roy. Soc. of South Australia, vol. 29, 1905, pp. 246-251.

The *Olenellus* described, p. 247, pl. 25, fig. 1, is referred by Walcott Cambrian fauna of China to the genus *Redlichia*.

——— The existence of a Cambrian fauna in Victoria.

Proc. Roy. Soc. of Victoria, for 1895, new ser., vol. 8, 1896, pp. 52-64.

——— and Mitchell (John). The Silurian Trilobites of New South Wales, with reference to those of other parts of Australia, Part 4.

The *Odontopleuridae*.

The authors use the term *Odontopleuridae* in preference to *Acidaspidae*, because they believe it to have precedence. Burmeister used the term in 1843 (*Organization of Trilobites*) for eight-jointed Trilobites with a short articulated caudal axis, incapable of enrollment. Division B, Subdivision A.

Proc. Linnean Soc. New South Wales, vol. 21, 1897, pp. 694-721, 6 plates.

ETHERIDGE (Robert, Jr.) and MITCHELL (John)—Continued

The authors describe:

Odontopleura Bozningensis n. sp., *O. Rattei* n. sp., *O. parvissima* n. sp., *O. Jenkinsi* n. sp., (The *Acidaspis Brightii* Jenkins mon. Murchison). *Ceratocephala Fogdesi* n. sp. (*Acidaspis Verneuli* Ratte non. Barrande), *C. Jackii* n. sp., *C. impedita* n. sp., *C. longispina* Mitchell.

—— The Silurian Trilobites of New South Wales with references to those of other parts of Australia.

Proceedings Linn. Soc. N. S. Wales, 1915, vol. 40, part 4, 1916.

Part V, The Encrinuridae, plates 54-57, pp. 646-680.

The authors describe and illustrate the following species:

Encrinurus Mitchelli Foerste, referring *Cromus Murchisoni* DeKoninck, pl. 1, fig. 9 (exclude figs. 9a and 9b) to the species.

Encrinurus Bozningensis Foerste.

The following are described as new species:

Encrinurus silverdalsensis, a robust species, about 2 inches long; the head approaches *E. variolalis*, but its enormous tail separates it from the European species.

Encrinurus Etheridgei, the largest Australian form known, has a length of 2½ inches, of which the tail occupies one inch.

Encrinurus Rothwelli.

The subrectangular and steep-sided thorax, very prominent thorax and pygidial axis, a circular end of the tail—axis, 11 pleural segments in the pygidium, widely expanded and tumid glabella, anteriorly forward eye-lobes, and strong drooping of the pygidium posteriorly, separate this species from *E. Mitchelli*.

Encrinurus? duntroonensis.

The authors illustrate only the head, which differs from all other species referred to *Encrinurus*.

1. In the transversely elongated elliptical form of the cephalon, with its nearly straight anterior border.

2. The closeness of the anterior branches of the facial sutures and the perpendicularity of the posterior branches of these, with the axial furrows, or central axial line.

3. The long, narrow and straight-sided glabella.

4. The anteriorly situated free cheek.

5. The sparse tuberculation.

6. The backward and inward situation of the eyes.

7. The manner in which the axial furrows bifurcate outward and inward on reaching the frontal borders of the free cheeks.

The authors suggest a new genus without naming it. Why not that of *Mitchellia* after this well-known author on the fossil Crustacea.

Fearnside (W. G.), Elles (G. L.) and Smith (Bernard). The Lower Palaeozoic Rocks of Pomeroy.

Proc. Royal Irish Acad., vol. 26, sec. B, No. 9, 1907, pp. 97-128, map and plate.

Trilobites: *Trinuclens concentricus* Eaton; also var. *Portlockii* Salter and var. *clongatus* Portl. and var. *arcuatus*.

Trinuclens seticornis His. *Dionide* cfr. *euglyptus* Ang. *Aeglina rediviva* Barr. *Phacops mucronatus* Brong.

The other Trilobites collected from Pomeroy have been described by Portlock in his Londonderry report.

Field (R. M.) Use of the Roentgen Ray in Paleontology Skiagraphy of Fossils.

Am. Jour. Sci., vol. 39, 1915, p. 543.

The author illustrates *Triarthrus Becki* in text and plate 8, fig. 9. The figure brings out the outline of the trilobite and several appendages which are buried in the matrix.

Finch (Grant E.) Notes on the position of the individuals in a group of *Nilcus vigilius* found at Elgin, Iowa.

Iowa Acad. Sci. Proc., vol. 11, pp. 179-181, plate, 1904.

Foerste (A. F.) Notes on Clinton Group Fossils, with special reference to collection from Indiana, Tennessee and Georgia.

Proc. Boston Soc. Nat. Hist., vol. 24, 1889, p. 261.

The author notes *Calymmene Blumenbachii* var. *Vogdesi* n. var., *C. rostrata* Vogdes.

Dr. Ulrich describes from the Niagara formation at Osgood, Ind., under the name of *Calymmene nasuta* n. sp., a snouted trilobite of a very large size, which resembles *Calymmene Niagarensis* Hall. This specimen was published in the Jour. Cincinnati Soc. Nat. Hist., vol. 2, No. 3, October, 1879, p. 131, figs. 1, 2 and 3. The Harvard Library did not receive this number until Feb. 19th, 1880, or about the time of its probable publication. About this time, in the Amer. Jour. Sci. for December, 1879, a species was described by Vogdes as *Calymmene rostrata* from the Clinton Group of Georgia Catoosa Station. These forms are very closely related to New York specimens, which are not quite so large, and the end of the snout is not so pointed as the published figures would indicate.

Dr. Berjoron, Bull. Soc. Geol. de France, 3d ser., vol. xviii, 1890, p. 365, pl. v, places similar species under a new genus. Describing under it *Calymmenella Boisseli* n. sp. and n. genus. The glabella is short and rounded in front, having three furrows, of which the last two are well marked. The specimen is somewhat like *Calymmene mammillata* Hall, from the Niagara group in Wisconsin.

The author also notes *Ilacenus ambiguus* Foerste, *I. ioxus* Hall. *Phacops pulchellus* Foerste. *Encrinurus punctatus* Wahl. *Lichas Boltoni* var. *occidentalis* ? Hall and *Cyphaspis clintoni* n. sp.

The author, on p. 272, places *Encrinurus ornatus* Hall with *E. Theschi* Foerste. He was in doubt regarding the Ohio specimen referred by Hall and Whitfield to *E. ornatus*, on account of its larger size and its higher geological position.

——— A description of the Trilobites, Mollusks and Brachiopods of the Clinton Group of Ohio and Indiana.

Geology of Ohio, vol. vii, 1893, pp. 522-601, plates 25-37a.

The author notes *Acidaspis Ortoni* Foerste, *I. brevispinosa* n. sp. *Proctus determinatus* Foerste. *Cyphaspis clintonensis* Foerste. *Ilacenus daytonensis* H. and W., *I. ambiguus* Foerste, *I. insignis* Hall, *I. madisonensis* Whitf. *Calymmene Vogdesi* Foerste. *Ceraurus* (*Pseudosphaerexochus*) *clintoni* n. sp. *Sphaerexochus pisum* n. sp. *Lichas breviceps* Hall. *Phacops trisulcatus* Hall. *Dalmanites Wertheri*. *Encrinurus punctatus* Wald. *Elpe Ulrichi* n. sp.

——— Characteristic Silurian Fossils from East Central Kentucky.

Geol. Sur. Kentucky Bulletin, No. 7, 1906, Part 3.

The author describes *Isochilina panolensis*, *Beyrichia lata-triplicata*. He also remarks that Prof. Hall, in Palæontology of New York, vol. 2, p. 301, published descriptions of a species of *Bollia* and of a species of *Beyrichia* under the same name *Beyrichia lata*, erroneously regarding these distinct species as opposite valves of the same species. *Beyrichia* is described first, but on Plate A 66 the *Bollia* is figured first.

The author refers to *Bollia lata* Hall's fig. 10b, and to *Beyrichia lata* Hall's figs. 10, c, d, e, pl. A 66.

FOERSTE (A. F.)—Continued

——— Silurian Fossils from the Kokomo West Union and Alger horizons of Indiana, Ohio and Kentucky.

Jour. Cincinnati Soc., vol. xxi, No. 1, 1909.

The author describes and illustrates *Isochilina panolensis* Foerste, *I. musculosa* n. sp. *Beyrichia lata-triplicata* Foerste. *Kloedenia kokomocensis* n. sp. *Illacnus depressus* Foerste. *Calymmene Clintoni* Vanuxem, *C. niagarensis* Hall. *Homolanotus delpinocephalus* Green. *Dalmanites tirulurus brevicaudus* var. nov.

——— Preliminary note on Cincinnati Fossils.

Bull. Denison Univ., June, 1909, vol. 14.

The author describes *Ceraurus miscneri* nov. sp. from Richmond, Ind.

——— Preliminary note on Cincinnati and Lexington Fossils of Ohio, Indiana, Kentucky and Tennessee.

Bull. Denison University, June, 1910

The author favors the use of *Cryptolithus* Green, for the genus *Trinucleus*, a generic term used by Bronn, Goldfuss, Emmrich, Angelin and Vogdes; although the generic name of *Nuttainia* was used by Eaton in 1832, in his Geological Text Book, 1832, p. 33, for a similar species to *Trinucleus tessellatus* Green.

The original description of this genus by Green, The Monthly American Journal of Geology, June, 1832, p. 560, pl. fig. 4, is as follows:

Genus *Cryptolithus*, *C. Tessellatus* Green, fig. 4.

"Clypeo rotundato, fronte valde convexo, capite antice semicirculari, margine tessellato, ornato."

Green Mon. Trilobites, p. 88, remarks *Cryptolithus* was proposed before the publication of *Nuttainia* Eaton.

Rafinesque in his paper dated Philadelphia, May, 1832, Atlantic Journal and Friend to Knowledge, vol. 1, No. 2, 1832, article on "The Genera of fossil Trilobites or Glomerites of N. America," mentioned *Cryptolithes* Green, on p. 72, and remarks that Dr. Green issued in April a first series of eight cast and species, accompanied with a synoptical table, among which a new genus *Dipleura*, and four new species of *Asaphus* and *Calymmene*.

Vogdes, in Bib. Palaeozoic Crustacea, 1893, p. 359, remarks that *Trinucleus* Lhwyd, 1698, *Lithophyccii Britannici Ichnographia*, Epistola 1, also Murchison Silurian System, 1839, p. 659, was a revived old name. Dr. Lhwyd's description meant no more than the general name of Trilobite of the more modern writers and could not, except by courtesy, set aside Dr. Jacob Green's gen. *Cryptolithus*. This generic name has been advocated by Foerste, also by Raymond, in a later publication.

The author also describes *Calymmene platycephala* sp. nov., *C. senaria* Conrad, *C. abbreviata* sp. nov., *C. callicephala* Green, *C. Meeki* sp. nov., *C. Meeki-retrorsa* and *Dalmanites Carleyi-rogersensis*.

Calymmene Meeki Foerste, Bull. Denison Univ., vol. 16, 1910, p. 84, pl. 3, fig. 18. This is the *Calymmene senaria* described by Meek from the Cincinnati Rocks. As types the larger specimens from Fairmont bed are selected. They have a rather extended posterior outline of the cephalon, resulting in acute genal angles.

Frech (Fritz). Die Karnischen Alpen, 1894.

The author refers *Phacops (Trimeroccephalus) cryptophthalmus* (Emm.) Trestze to the new species of *anophthalmus*.

——— Palaeozoica, 1897, Bd. 2, Theil 1.

The author describes as new *Phacops (Trimeroccephalus) anophthalmus*, p. 278, plate 35, fig. 18.

——— *Lethaea geognostica*, part 1. *Lethaea palaeozoica*, Bd. 2, p. 66, 1902.

The author proposes the genus *Proampyx* for *Anomocare acuminatum* Angelin. This species, with its pointed glabella, seems to be the forerunner of *Ampyx*, and differs from the typical *Anomocare* with rounded, cephalic shield, very greatly.

Fritsch (Dr. Ant.) Preliminary notes on *Prolimulus Woodwardi* from the Permian Gaskohle als Nyran Bohemia.

Geol. Mag. London, Decade iv, vol. 6, 1899, pp. 57-59.

The author gives a figure of *Prolimulus Woodwardi* on p. 58, and remarks that *Prolimulus* very closely resembles one of the embryonic stages of the living North American *Limulus polyphemus*. The earliest known Limuloid Crustacean named *Neolimulus falcatus*, Woodward Geol. Mag., vol. 5, p. 1, pl. 1, figs. 1, 1a, 1868, was from the Silurian of Lesmahagow, Scotland. Bailey described *Bellinurus Kiltorkensis* from the Upper Old Red Sandstone Kiltoreen, Ireland, in 1869.

The genus *Bellinurus* was established by König in 1825, for certain small king crabs, under the specific name of *B. bellulus*, without a description of the genus or species. It is now known as *Bellinurus lumatus* Martin Petrefacata Derbiensia, pl. 45, fig. 4.

Bailey in 1863 described *B. arcuatus* and *B. reginae*, from the Coal Measures of Queens County, Ireland. In 1872 Woodward described *B. Koenigianus* Coal Measures, Dudley.

Meek and Worthen from the Coal Measures of Illinois, describes *Prestwichia* (*Limulus*) *anthrax* Prest. and *P. rotundata* Prest.

In 1872 Woodward described *P. Birtwelli* from Coal Measures, Padilham, Lancashire.

These Crustaceans have been described from the Muschelkalk, Jurassic, Cretaceous and Tertiaries, and are now living in the seas of Eastern North America and of Japan. A remarkable persistent type of the Xiphosura from the Silurian to the present time.

Frood (A. H.) Description of fossils from Kimberley District, Western Australia.

Geol. Mag. London, Decade 3, 1890, vol. 7, p. 98.

Olecnellus ? *Forresti* n. sp., pl. 4, figs. 2 a-b.

Walcott, 1913, p. 104, refers this to the genus *Redlichia*.

Gaudry (A.) Les enchainements du monde animal dans les temps Géologiques Fossils Primaires, Chapter X, 1877.

The author illustrates many species of Palaeozoic Crustacea with figures of *Asaphus platycephalus* and *Calymene senaria* exhibiting the ventral side and structure of the feet and antennae.

Geinitz (H. B.) Die Versteinerungen der Steinkohlen formation in Sachsen, Leipzig, 1855.

The author describes as *Halonion irregularis* several fragments of Arthropod, p. 38, pl. 4, fig. 5.

Gemmellaro (G. G.) Crostacei dei calcari con fusulina della Valle del fiume sosio nella Prov. di Palermo in Sicilia.

Mem. Soc. Ital. Sci., vol. 8, 1890, 3d ser., 40 pp., with 5 plates.

Trilobiti—*Proetus postcarbonarius*, n. sp., *P. ? Salomonensis* n. sp. *Phillipsia sicula* n. sp., *P. Ochleri* n. sp., *P. Sosisiensis* n. sp., *P. pulchella* n. sp. *Griffithides verrucosus* n. sp. *Pseudophillipsia elegans* n. gen. et sp.

The type of the new genus is *Pseudophillipsia Sumatrensis* Roemer.

Macrurus Crustaceans—*Palacopemphix* n. gen., *P. Sosisensis* n. sp., *P. affinis* n. sp., *P. Meyeri* n. sp.

Brachyurous Crustaceans—*Paraprosopon* n. gen., *P. Reussi* n. sp. *Oonocarcinus* n. gen., *O. insignis* n. sp., *O. anceps* n. sp., *O. Geintzi*.

Ostracoda—*Cypridinella rostrata* n. sp., *C. inflata* n. sp., *C. cypridellopsis* n. sp., *Cypridella Jonesi* n. sp., *C. granulifera* n. sp. *Cypridina Adrianensis* n. sp., *C. elliptica* n. sp., *C. marginata* n. sp., *C. aff.*, *C. primaevae* McCoy. *Philomedes acanthoides* n. sp. *Entomoconchus elongatus* n. sp. *Entomis polita* n. sp., *E. aequilobatus* n. sp. *Beyrichia* sp.?

Girty (George H.) Devonian and Carboniferous Fossils.

U. S. Geol. Survey, Monograph No. 32, 1899; part 2, pp. 476-581.

Proetus peroccidens H. and W., *P. Loganensis* H. and W.

The author is inclined to include both of these species under one, but leaves it an open question.

——— Notes on the Carboniferous Fossils. Geology and ore deposits Bisbee Quadrangle, Arizona.

U. S. Geol. Survey, Professional Papers No. 21, 1904, pp. 46-53, 2 plates.

Phillipsia peroccidens H. and W. figured the pygidium, pl. X, fig. 22. The species is rather characteristic of the Escabrosa Limestone.

——— The Guadalupian fauna.

Professional Paper U. S. Geol. Sur., No. 58, Washington, 1908.

The author uses *Anitopyge* new genus for *Phillipsia peranulata* Shumard.

The genus *Phillipsia* has 9 thoracic segments, and the new genus, as far as known, has but 7. In the pygidium the axis contains about 30 joints.

Anitopyge is similar to *Cheiropyge* (a new genus described by Dieuer of Himalayan fossils) in the unequal segmentation of the axial and lateral portions of the pygidium—in *Anisopyge* the pygidium is surrounded by a broad, smooth band, while in *Cheiropyge* the lobes are extended so as to give this member a denticulate outline.

The author describes *Anisopyge antiqua* n. sp. *Cythere* ? sp. *Bairdia* aff., *B. plebeia* Ruess, *Argilloecia* sp.

——— The fauna of the phosphate beds of the Park City formation in Idaho, Wyoming and Utah.

Bull. U. S. Geol. Sur., No. 436, Washington, 1910.

The author describes and figures *Hollina emaciata* var. *occidentalis* n. var. *Jonesiana carbonifera* n. sp., which closely resembles the English species *J. arcata*, but differs in a more equilateral form with a much narrower sulcus.

Cytherella benniei J. and B.

——— The fauna of the Moorefield shale of Arkansas.

Bull. U. S. Geol. Sur. No. 439, 1911.

The author records an undetermined Griffithides and three Ostracoda. *Paraparchites nicklesi* Ulrich, *Primitia moorefieldana* n. sp. and *Bairdia attenuata* Girty.

——— On some new genera and species of Pennsylvania fossils, from the Wewoka formation of Oklahoma.

Ann. N. Y. Acad. Sci., vol. 21, pp. 119-156, 1911.

Describes *Griffithides parvulus* n. sp. Differs from *G. ornatus* in the configuration of the basal portion of the glabella.

GIRTY (George H.)—Continued

——— A report on the upper Palaeozoic fossils collected in China in 1903-04.

Carnegie Inst. Washington, Research in China, vol. 3, 1913, pp. 297-328, pls. 27-29.

The author illustrates an imperfect pygidium of *Phillipsia*, somewhat like *P. scitula* of the American Coal Measures.

——— New genera and species of Carboniferous fossils from the Fayetteville shales of Arkansas.

Annals New York Acad. Sci., vol. 24, 1910, pp. 189-238.

Griffithides parvulus nov., *G. mucronatus* nov.

——— Fauna of the Wewoka formation of Oklahoma.

Bull. U. S. Geol. Sur., No. 544, 1915.

The author refers *Phillipsia* (*Griffithides* ?) *Sangamonensis* M. and W. to the genus *Phillipsia*. *Griffithides parvulus* Girty. The surface is marked by granules of small nodes.

The author compares it with *G. ornatus*, but is much smaller and differs in the configuration of the basal portions of the glabella.

——— Fauna of the Batesville sandstone of Northern Arkansas.

Bull. No. 593, U. S. Geol. Sur., 1915.

The author describes *Griffithides mucronatus* nov. The same name was used by Traquair in 1862, for an Irish species of the genus, which Woodward, 1883, referred to *Phillipsia Eichwaldi* var. *mucronatus*.

Goldenberg (Fr.) Fauna Sarepontana Fossilis Die fossilen Thiere aus Steinkohlenformation von Saarbüeken Hefts 1 and 2, 1875 and 1877.

Arthropleura affinis sp. nov., pl. 1, figs. 11-12.

Gorham (Frederic P.) The Cambrian deposits of North Attleboro.

Bull. No. 9, Roger Williams Park Mus., Providence, R. I., 1905.

The author illustrates from Shaler and Foerste's Bull. Mus. Comp. Zool. of Harvard Univ., 1888.

Olenellus Walcottii Shaler and Foerste may be identical with *Elliptocephala asaphoides* Emmons. *Microdiscus lobatus* Hall. *Ptychoparia attleboroensis* S. and F. Aris-
tozoe *Microdiscus belli-marginatus* S. and F. *Ptychoparia mucronata* S. and F. This may be *Atops trilineatus* Emmons. *Microdiscus speciosus*.

Grabau (A. W.) Guide to the Geology and Palaeontology of the Niagara Falls and vicinity.

Bull. N. Y. State Mus., No. 45, vol. 9, 1891.

The author illustrates the Palaeozoic crustacea of the New York Niagara Group with original figure of *Eurypterus remipes*.

——— Palaeontology of the Cambrian Terraines of the Boston Basin.

Occasional Papers Boston Soc. Nat. Hist., vol. 4, part 3, 1901, pp. 601-694, plates 31-39.

Trilobita: *Olenellus* (*Holmia*) *Bröggeri* Walc. O. sp., *O. (Mesonacis) asaphoides* (Emm.), *O. Walcottii* S. and F. *Metadoxides magnificus* Matth. *Microdiscus belli-marginatus* S. & F., *M. lobatus* Hall, *M. sp. Strenuella strenura* (Bill.). *Argulus quadrangularis* Whitt.

The author represents a restored figure on p. 676, with 16 ? thorax segments, with measurements of the head, which varies in length, exclusive of the occipital ring, from

GRABAU (A. W.)—Continued

7 to 20 mm. *Ptychoparia Rogersi* Walc., *P. ? attleborensis* S. and F. *Paradoxides Harlani* Green.

The author remarks that among the American relative of *Paradoxides Harlani* the most nearly related to the broad form is *P. regini* Matthew, from St. John Group; also *P. Bennetti* Salt.

The nearest relative of the narrow form is the *Paradoxides spinosus* the Bohemian species. Many years ago Linne Mus. Tessiniaum, 1753, p. 98, pl. 3, described under the name of *Eutomolithus paradoxus* a trilobite of a wide form, about 6¾ inches long. Brongniart describes it as *Paradoxides Tessini*, using the narrow form of Wahlenberg's pl. 1, fig. 1, which he has copied.

The original, quoted from Dimbo, Sweden, by Linné, has never been again found in Sweden, the specimen may be one from Boston, Mass., obtained from the Boston Wharves by some Swedish naturalist in early days, the stones from the Braintree quarries were used in the Boston Harbor.

——— Guide to the Geology and Palaeontology of the Niagara Falls and vicinity.

Bull. No. 45, vol. 9, 1901, New York State Museum.

The following Foss crustacea are described and illustrated:

Iscochilina cylindrica (Hall). *Leperditia scalaris* Jones, fig. 150. *Bollia symmetrica* (Hall), fig. 151. *Aehmina spinosa* (Hall), fig. 152.

Trilobita—*Homalonotus delphinocephalus* (Green), fig. 153. *Iliaenus ioxus* Hall, fig. 154. *Dalmanites linulurus*, fig. 155. *Calymmene Blumenbachi Niagarensis* Hall, fig. 156. *Lichas Boltoui*, plate 17. *Eucrinurus ormata* H. and W., fig. 157. *Broutens Niagarensis* Hall, fig. 158. *Ceratiocaris acuminata* Hall, fig., *C. Physganocaris ? Deweyi* Hall, fig. 160. *Eurypterus lacustris* Harland, *E. remipes* DeKay, fig., pl. 18, *E. pustulosus* Hall, *E. robustus* Hall, *E. pachychirus* Hall, *E. Dekayi* Hall. *Dolichopterus macrochirus* Hall. *Eusarcus grandis* G. and P. *Pterygotus macrophthalmus* Hall, *P. Cobbi* Hall, *P. globicaudatus* Pohl.

——— The Palaeontology of Eighteen Mile Creek and Lake Shore sections of Erie County, New York.

Bull. Buffalo Soc. Nat. Sci., vol. 6, 1901, in four parts.

Ceratiocaris Deweyi Hall, *C. acuminata* Hall.

——— Guide to the Geology and Palaeontology of the Niagara Falls and vicinity.

Bull. Buffalo Soc. Nat. Sci., vol. 9, 1902.

——— and Sherzer (W. H.) The Monroe formation of southern Michigan and adjoining regions.

Michigan Geol. and Biological Sur. Geol., ser. 1, 1910.

Ostracoda—*Leperditia scalaris* Jones, *L. angulifer* Whitf., *L. attoides* nov., *L. alta* Con. *Kloedenia Monroensis* nov.

Trilobitae—*Proetus crassimarginatus* Hall.

Merostomata—*Eurypterus Eriensis* Whitf.

——— North American index Fossil Invertebrates.

Two volumes, New York, 1910, 909 pp., 726 figures.

Gives brief descriptions of genera and species. Appendices give tables of geological formation and a faunal summary showing distribution, also a classified bibliography.

Gronwall (Karl A.) Bornholm Paradoxideslag og deres Fauna Darnarks.

Geol. Under. II Rackke, No. 13, Kjobenhavn, 1892.

Thirty-five species or varieties of the genus *Agnostus* are figured and described:

Agnostus aculeatus Ang., *A. altus* n. sp., *A. atavus* Tbg., *A. bibullatus* Barr., *A. bidens* Meek, *A. bituberculatus* Ang., *A. brevifrons* Ang., *A. cambrensis* Hicks, *A. cicer* Tbg. and var. *forfex* n. var., *A. elegans* Tbg., *A. Eskriggei* Hicks, *A. exaratus* n. sp., *A. exsculptus* Ang. ex parte cf. *integra* Walc. and cf. *sulcifera* Walc. *Agnostus fallax* Lurs. cf. *ferox* Tbg. and var. *insignis* Walc., *A. fissus* Lug. MS. and var. *per-rugatan* var. and var. *trifissa* Matth. *Agnostus gibbus* Lurs. and var. *hydrida* Br. *Agnostus gladiiformis* Ang. and var. *resecta* n. var. *Agnostus incertus* Barr., *A. insularis* n. sp., *A. integer* Barr. and var. *spinosa* Pomp., *A. intermedius* Tbg., *A. Kjerulfi* Br., *A. laevigatus* Dalm., also var. *ciceroides* Matth., var. *forfex* Br., var. *mammilla* Matth., var. *similis* Br. and var. *terravica* Matth. *Agnostus lens* n. sp. and var. *frontosa* n. var., *A. lingula* n. sp., *A. Lundgreni* Tbg. and var. *nana* n. var., *A. Nathorsti* Br. and var. *confiens* Matth. *Agnostus nudus* Beyr., also var. *marginata* Br. and *scanica* Tbg. *Agnostus parvifrons* Lurs., also var. *mammillata* Br. and *nepos* Br. *Agnostus planicauda* Ang. and var. *vestgothica* Wall., *A. punctuosus* Ang., also var. *affinis* Br. and *bipunctata* Br. *Agnostus pusillus* Tbg., *A. quadratus* Tbg., *A. rex* Barr., *A. rotundus* n. sp., *A. stenorrhachis* n. sp., *A. tessela* Matth., *A. truncatus* Br. and *A. umbo* Matth. *Agralos ceticephalus* Barr., *A. depressa* n. sp., *A. difformis* Ang., also var. *aculeate* (Ang.) Br. and *acuminata* (Ang.) Br., *A. longicephalus* Hicks. *Anomocare Angelini* n. sp., *A. angustifrons* Tbg., MS., *A. excavatum* Ang., *A. laeve* Ang., *A. latelimbatus* Dames, *A. limbatus* Ang. *Anopolenus* Salter. *Apatocephalus* Br. *Arionellus* Ang. *Atops* Emmons. *Beyrichia Angelini* Barr. and var. *armata* n. var.

Cainatops Matth. *Carausia Menesviensis* Hicks. *Centropleura Henrici* Salt., *C. impar* Hicks, *C. Loveni* Ang., *C. Salteri* Hicks, *C. Steenstrupi* Ang., *C. venusta* Bill. *Conocephalina ornata* Br. The author uses Brögger's generic name, but does not define the genus. *Conocoryphe aequalis* Lurs., *C. Baileyi* Matth., *C. bufo* Hicks, *C. Dalmanni* Ang., *C. elegans* Walc., *C. emarginata* Lurs., *C. glabrata* Ang., *C. Heberti* Berg., *C. Levyi* Berg., *C. pustulosa* Matt., *C. reticulata* Walc., *C. Sulzeri* v. Schloth., *C. tenuicincta* Lurs., *C. trilineata* Emm., *C. (Erinnys) breviceps* Ang., *C. (Erinnys) venulosa* Salt., *C. (Ctenocephalus) coronata* Barr., *C. (Ctenocephalus) exsulans* Lurs., *C. (Ctenocephalus) laticeps*, *C. (Ctenocephalus) Matthevi* Hartt., *C. (Ctenocephalus) Solvensis* Hicks, *C. (Ctenocephalus) tumida* n. sp., *C. (Liocephalus) impressa* Lurs., *C. (Liocephalus) Linnarssoni* n. sp., *C. (Liocephalus) Lyelli* Hicks, *C. (Liocephalus) teres* n. sp. *Corynexochus bornholmiensis* n. sp., *C. Romingeri* Matt., *C. spinulosus* Ang., *C. umbonatus* Ang. *Dorypyge Curticei* Walc., *D. danica* n. sp., *D. desiderata* Walc., *D. Ellsi* Walc., *D. gothica* H. and W., also var. *acadica* Matth., *D. horrida* Matth., *D. oriens* n. sp., *D. quadriceps* H. and W., also var. *valida* Matth., *D. Richthofeni* Dames, *D. Slatkowskii* Fr. Schm. *Holocephalina inflata* Hicks, *H. primordialis* Salt. *Leperditia primordialis* Lurs. *Liocephalus* n. subgen.

The new subgenus *Liocephalus* has as type species *C. impressa* Lurs. and *C. Lyelli* Salt., and it is also probable that Salter's genus *Holocephalina* is to be referred hither.

Liostracus globiceps n. sp., *L. Linnarssoni* Br., *L. Maydelli* Fr. Schm., *L. microphthalmus* Ang., *L. platyrhinus* n. sp. *Microdiscus pulchellus* Hartt., *M. punctatus* Salt., *M. scanicus* Lurs., also cf. *eucentra* Lurs. *Neolenus granulatus* Matth., *N. serratus* Rom. *Olenoides Fordi* Walc., *O. Marcoui* Whitf., *O. nevadensis* Meek.

Paradoxides Abenacus Hartt., *P. bohemicus* Boeck, *P. brachyrrhachis* Lurs., *P. Davidis*

GRONWALL (Karl A.)—Continued

Salt., *P. eteminicus* Matth., *P. Forchhammeri* Ang., *P. Harknessi* Hicks, *P. Hicksii* Salt., also var. *palpebrosa* Lhrs., *P. lamellatus* Hartt, *P. mediterraneus* Pomp., *P. Pingelii* (nov. Beck MS.).

Grönwall, p. 107, refers *Paradoxides Davidis* Salt., to *P. Pingelli* Beck MS. The author refers to an unpublished plate 43 of Angelin's fasc., on which *P. Davidis* Salt. is reproduced under the name of *P. Pingelii* Beck MS.

Paradoxides pradoanus Barr., *P. rugulosus* Corda, *P. Sjögreni* Lhrs. and var. *nepos* n. var., *P. spinosus* Boeck, *P. Tessini* Brong., *P. tumidus* Ang., *P. Ölandicus* Sjögr., *P.* sp. indet. Nos. 1-3.

Ptychoparia Johnstrupi n. sp., *P. striata* Emmr. *Solenopleura acadica* Whiteave's MS. and var. *elongata* Matth. *Solenopleura brachymetopa* Ang. and var. *alutacea* Br., also *nuntia* n. var., *S. bucculenta* n. sp., *S. canaliculata* Ang., *S. holometopa* Ang., *S. parva* Lhrs. *Zacanthoides Eatoni* Walc., *Z. flagricaudus* White, *Z. humerosus* Salt., *Z. levis* Walc., *Z. spinosus* Walc., *Z. typicalis* Walc.

Gortani (Michele). Contribuzioni allo studio del Palæozoico Carnico. Le Fauna a Climenie del Monte Primosio.

Mem. R. Acad. Sci. Bologna, ser. 6, vol. 6, 1907, pp. 201-243, plates 1-2.

The author divides the genus *Trimerocephalus* McCoy into the subgenus *Eutrimerocephalus*. In which he places *T. laevis* Münster, *Phacops* (*Trim.*) *anophthalmus* Frech, *P.* (*Trim.*) *carithiacus* Frech, and a new species under the title of *Trimerocephalus* (*Eutrimerocephalus*) *carnicus*. This series without eyes.

2—Subg. *Microphthalmus* with small eyes slightly faceted. The author places under this: *Trimerocephalus* (*Microphthalmus*) *cryptophthalmus* Emm., *T. (M.) pseudogranulatus* sp. nov., *T. (M.) mastophthalmus* Richter sp., *T. (M.) Roemeri* Gortani, *T. (M.) macrocephalus* Richter sp., *T. (M.) incisus* Roemer sp., *T. (M.) acuticeps* Kayser.

Under the genus *Proetus* the author records one species. *Proetus* cf. *Phocion* Billings, 1874; a small tail only. Under *Dechenella* the author records two species. Fragments of the head so far only figured. *Dechenella Vinassai* n. sp., Rudf. Richter refers this to *Cyrtosymbole vinassai* (Gortani), also the other species *Dechenella italica*.

Gortani (M.) and **Regny** (P. Vinassa). de Fossili neosilurici del Pizzo di Tinau e dei Pal Nell'alta Carnia.

Memoria Acad. Sci. Bologna, ser. 6, 1909, p. 87-119, plate 1.

The fossil Crustacea indicated by the authors are Ostracoda Aparchites indt. compared with *A. mitis* Jones and *Lindströmi* Jones.

Trilobites: *Encrinurus Beaumonti* Barr. var. *Nozaki* Frech, *Proetus* n. f. (*foveolatus* n. sp.) The authors illustrate moveable cheek of this species comparing it with *Proetus crassimargo* Hall.

Harpes crassifrons Barr. var. *forojulensis* n. sp. The authors illustrate a fragment of the head of this species.

Groom (T. T.) On a new Trilobite from the Dietyomena shales of Malvern Hills.

Geol. Mag. London, Dec. IV, vol. 9, 1902, pp. 70-73, 4 figures.

Acanthopleurella Grindrodi n. gen. et sp.

The conformation of the head suggest Trinucleoid affinities, but there is no marginal rim, and the rest of the body appears to show Olinid characters. Shumardia is possibly an ally, but the new genus differs in the extension of the glabella to the front margin of the head, in the absence of glabella furrows, and in the spinous prolongation of the thoracic pleurae.

Gümbel (C. W.) Geognostische Beschreibung des Fichtegebirges. 1879.

The author refigures the original of *Trinnucleus laevis* Münster with eyes, together with granulations over the surface of the head shield. He identifies *Trinnucleus laevis* Münster with *phacops cryptophthalmus*.

Gortani, 1909, p. 229, refers Münster's species to *Trimerocerophalus*. (*Eutrimerocerophalus*) *laevis* v. Münster.

Gunther (A. F.) Ueber die Trilobiten u Rudisten.

Sitzber. d. Ges. Isis, Dresden, Jhg., 1869 (1870), pp. 12-15.

Sao hirsuta Barr.

Gürich (Georg). Das Palaeozoikum des Polnischen Mittelgebirges.

Verhandl. d. Russ. Kaiserl. Mineralog. Ges., vol. 32, 1896.

Arthropoda, pp. 353-373, plates 10 and 15.

The work contains descriptions and illustrations.

Agnostidae: *Agnostus fallax* Linnr. *A. gibbus* Linnr.

Olenidae: Paradoxides of Tessini Brong.

Conceptulidae: *Liostracus Linnarsoni* Brögger.

Bronteidae: Bronteus sp., *B. Kielcensis* n. sp.

The author refers *B. flabellifer* var. F. Roemer Z. D. Geol. Ges., 1866, p. 671, pl. 15, fig. 1a-c 6 to this new species.

Phacopidae: *Trimerocerophalus typhlops* sp. nov.

Frech gives the name of *Phacops anophthalmus* for *Phacops cryptophthalmus* Emmer. (F. Roemer Z. D. Geol. Ges., 1866, pl. 13, figs. 6-7.)

Gürich refers it to his new species.

Trimerocerophalus sp.

Phacops caecus n. sp. (a species without eyes), *P. Posidoniae* n. sp., *P. Schlotheimi* Bronn. and *P. latifrons* Br. *Cryphaeus lacinatus* F. Roemer.

The author refers *C. Grooti* Beushausen, 1884, to this species.

The author gives the name of *Cryphaeus Kayseri* for Kayser's *Cryphaeus Lethaeae* Faunades Hauptquarzites der Wiedaer Schiefer, p. 86.

Acidaspidae: Two species.

Proetidae: *Cyphaspis ceratophthalmus* Goldf., *C.* sp. *Proetus* cf., *cornutum* Goldf., *P. margaritaceus* n. sp. *Dechenella Dombrowsiensis* n. sp. Richter refers this to his new subgenus Basidechenella. *Dechenella polonica* n. sp. Richter refers this to his new subgenus Eudechenella. *Dechenella pusilla* n. sp. Richter refers this to the new genus Cyrtosymbole.

Ostracoda: pp. 374-391.

Entomidae: *Entomis migratoria* n. sp., *E. serratostrata* Sandb., *E.* sp., *E. tenera* n. sp., *E. angulosa* n. sp., *E. vittata* n. sp., *E. scabra* n. sp., *E.* cf. *gyratan* Richter, 1869. *Entomis* sp. (cf. *nitidan* F. A. Roemer, Beil., pl. 4, fig. 20).

Lepiditidae: *Lepiditia phaseolus* His. Silurian.

Lepiditia Amphiporae n. sp. Devonian. *Bolbozoe polonica* n. sp.

New genus Antitomis, type *A. bisulcata* n. sp.

Trigonocaris dubia n. sp.

Primitia humiliiformis n. sp., *P. obliqua* n. sp., *P. ornatissima* n. sp., *P. plana* n. sp., *P. lentiformis* n. sp., *P. fabaeformis* n. sp., *P. Calceolae* n. sp. *Primitia* sp., *P. entomidella* n. sp. *Primitiopsis piciiformis* n. sp.

Aparchites sp.

Beyrichia Kloedeni McCoy, *B.* cf. *Buchianan* R. J., *B.* cf. *Salterianam* R. J. *Kloedenia* cf. *Wilkinsianam* R. J.

GÜRICH (Georg)—Continued

Bollia sp.

New genus Polyzgia, type *P. symmetrica*.

New genus Poloniella, type *P. devonica*.

Bythocypris polaris n. sp. *Bairdia devonica* n. sp.

——— Nachtrage zum Palaeozoicum des Polnischen Mittelgebirges.

Neuen Jahrb. für Mineral Geol. and Palaeont. Beilage, Band XIII, 1900, pp. 331-388, plates 14 and 15.

The author describes several new species of Trilobites, which he illustrates as *Illaenus polonicus* nov. sp., which he compares with *I. parvulus* Holm and *Panderia minima* Volborth. *Aeglina Koutkiewiczzi* nov. sp., figure of the pygidium. *Proetus margaritaceus* Gür., fig. in text, *P. pyriformis* sp. nov., fig. of glabella, *P. Michalskii* Gür. *Dechenella pusilla* Gür. *Beyrichia trigonata* Gür.

——— Jura und Devon Fossilien von White Cliff, Australien.

Neuen Jahrbuch für Min. Geol. and Palaeont. Beilage, Band xiv, pp. 484-539, plates 18-20, 1901.

The author describes a new genus of Lichas as *Craspedarges* including under it one species, *C. Willmanniae* Gürich. He also gives figures of *Euarges meridionalis* Frech and *E. granulatus* F. A. Roemer. The author uses as subgenera to Lichas the following subgenera:

Ceratarges for the preoccupied term *Arges* Goldf., with *L. armatus* Goldf. for its type.

Plusiages for *Corydocephalus* Corda, owing to the uncertainty attached to Corda's types, Type *L. palmatus* Barr.

Liparges substituted for Corda's *Dicranomyus*, type *L. simplex* Barr.

Trachylichas name proposed in place of *Dicranopeltis* Corda, type *Lichas scarba* Beyr.

Echinolichas Gurich type *L. eriopis* Hall.

Metopolichas used for preoccupied name *Metopias* Eichw., type *L. Hubneri* Eichw.

Platopolichas Gurich, type *L. avus* Barr.

Platylichas, type *Lichas margaritifera* Nieszk.

Dr. Gurich takes *Platymetopus Holmi* Schmidt as the type of this genus, but it should be abandoned for the group, as it was used by Dejean in 1829 for a genus of insects.

Pterolichas for *Arctinurus Boltoni*.

Platynotus was used by Conrad in 1838 for the same species.

Euarges for preoccupied term *Acanthopyge* Corda, type *L. Haureri* Barr.

Leiolichas Schmidt, type *L. illaenoides* Nieszk.

Homolichas Schmidt, type *L. depressus* Ang.

Hoploichas Dames, type *L. tricuspidata* Beyr.

Ceratolichas Hall and Clarke, type *L. gryps* Hall.

Conolichas Dames, type *L. aequiloba* Steinhardt.

Hemiarges Gurich, type *L. Wessenbergensis* Schmidt.

Platymetopus Ang., type *L. planifrons* Ang. (*Amphilichas* Raymond).

Oncholichas Schmidt, type *L. ornatus* Ang.

Hall (James). Relations of the genus *Eurypterus*.

Proc. Am. Acad. Arts and Sci., vol. 4, 1860, p. 353.

——— On the genus *Eurypterus*.

Trans. Albany Inst., vol. 4, 1860, p. 280.

HALL (James)—Continued

——— Preliminary notice of the Fauna of the Potsdam sandstone, with remarks upon previously known species of fossils and descriptions of some new ones from the sandstone of the Upper Mississippi Valley.

Trans. Albany Institute, vol. 5, 1867, pp. 93-195, with six plates.

A notice of this paper was read before the Albany Institute April 29, 1862, and by an arrangement between the Publishing Committee and the Regents of the University, it was published in the 16th Report on the State Cabinet, pp. 119-226. The starred pages 135 and 136 were not issued in the Trans. Albany Inst.

On page 193 of the Trans. Albany Inst., the text contains figures of *Pemphigaspis bullata*, also figures of *Amphion ? matutina*, *Conocephalites (Trionellus) dorsalis* and *C. optatus*, not republished in the text of the 16th Report N. Y. State Cabinet, but included in Plate V. A. except *C. dorsalis*.

For list of fossil Crustacea, see 16th Report N. Y. State Cabinet, 1863; also Contributions to Palæontology from investigations made during the years 1861-1862.

Harbort (E.) Ueber mitteldevonische Trilobitenarten im Herger Kalk bei Grund im Harz.

Zeitschr. Deutsch. Geol. Ges. Bd., 55 Jahrg, 1903, pp. 474-485, 2 plates.

Acidaspis pigra Barr. *Cyphaspis ceratophthalma* Goldf., *C. convexa* Barr. *Bronteus granulatus* Goldf., *B. flabellifer* Goldf. *Harpes* cf. *socialis* Barr., *H. convexus* Trenkn.

Haynes (Winthrop P.) Discovery of bivalve Crustacea in the coal measures near Pawtucket, R. I.

Science N. S., vol. 37, No. 944, pp. 191-192, 1913.

The author records the discovery of the carapaces of bivalve Crustacea of the genus *Leaia* and *Estheria* from the Narragansett Basin coal measures, which the author compares with *Leaia tricarinata* Meek and *Estheria* not sufficiently well preserved to determine.

Henderson (John). Short notices of three species of Trilobites from Silurian Beds of the Pentland Hills.

Trans. Edinburgh Geol. Soc., vol. 1, pt. 1, 1868, pp. 21-23.

The author mentions *Phacops Stokesii* and *Calymmene Blumenbachii*. He remarks that the species described as *Encrinurus expansus* by Haswell, in his Geology of the Pentland Hills, must not have been perfect, as he omitted any description of the free cheeks or facial suture. The author refers the *Zethus Pageii* Haswell to the free cheek of *Encrinurus expansus*. This species is broadly ovate, length about one and one-fourth of an inch; breadth two-thirds of the length, cephalic shield, semi-circular tuberculated posterior angles rounded; the glabella pear-shaped, convex, and covered with tubercles, and punctured between the tubercles; large tubercles, occupying the place of lateral lobes; cheeks triangular convex and embracing the front of the glabella; eyes pedunculated and placed between the centre of the cheek; and the glabella obovate and covered with a fine net work of facets.

——— Notice of *Silimonia acuminata* from the Silurian of the Pentland Hills.

Trans. Edinburgh Geol. Soc., vol. 1, 1870, pp. 18-19.

——— On some recently discovered fossiliferous beds in the Silurian rocks of the Pentland Hills.

Trans. Edinburgh Geol. Soc., vol. 3, 1880, pp. 353-356.

Herrick (C. L.) Observations upon the so-called Waverly Group of Ohio.

Geol. Ohio, vol. 7, 1893, pp. 495-515, plates 14-24, Chapter IV.

Proetus praecursor Herrick. *Phaethonides spinosus* Herrick. *Phillipsia meramecensis* Shumard. *Proetus minutus* Herrick. *Phillipsia serraticaudata* Herrick. *Phaethonides immaturus* Herrick, *P. occidentalis* Herrick. *Proetus* sp. ?, *P. auriculatus* Hall.

This chapter is a summary of the results of observations published in the Bulletins of Denison University, the American Geologist, and the Bulletins of the American Geological Society.

The plates are from the Bull. Denison University.

Hind (G. J.) and Fox (H.) On Radiolarian rocks in the Lower Culm.

Quart. Jour. Geol. Soc., vol. 51, p. 609.

Trilobites by Dr. Henry Woodward, pp. 646-649.

Phillipsia Leei Woodw., *P. minor* Woodw. *Phillipsia* larval form.

Griffithides acanthiceps Woodw., *G. longispinus* Portl. *Proetus* species A-B.

Hitchcock (C. H.) Notice of a new species of *Acidaspis* from a boulder of Marcellus shale found in drift at West Bloomfield, New Jersey.

Bull. Am. Mus. Nat. Hist., vol. 19, 1903, pp. 97-98, plate 6.

The author describes *Acidaspis Whitfieldi* n. sp., which he compares with *Acidaspis mira* Barr., but the new species is rather more complicated in the distribution of the spines.

Hochsteetter (F.) Silursniten (12 Gypsabgüssen seltener Trilobiten). Verh. d. k. k. Geol. Reichsanst., Wien Jhg., 1877, p. 74.

Hoek (P. P. C.) Neues Jahrb für Min. Geol. and Pal., 1912.

Hoenes (R.) Die Trilobiten Gattung *Phacops* und *Dalmanites*.

Jahrb. k. k. Geol. Reich., 1880, vol. 30, part 4, pp. 657-686.

Ordovician: *Dalmanites Angelini* Barr., *D. atavus* Barr., *D. Deshayesi* Barr., *D. Hazleii* Barr., *D. Morrisiana* Barr., *D. orba* Barr., *D. Phillipsi* Barr., *D. socialis* Barr. and var. *proaeva* Emm., also var. *grandis*.

Silurian: *Dalmanites auriculata* Dalm., *D. cristata* Corda, *D. Fletcheri* Barr., *D. Hausmanni* Brongn., *D. McCoyi* Barr., *D. Reussi* Barr., *D. spinifera* Barr. *Phacops rugosa* Corda, *P. spinifera* Barr., *P. Glockeri* Barr., *P. Boeckii* Corda, *P. breviceps* Barr., *P. Bronni* Barr., *P. buliceps* Barr., *P. cephalotes* Corda, *P. emarginatus* Barr., *P. secundus* Barr., *P. Hoeninghausi* Barr., *P. intermedius* Barr., *P. miser* Barr., *P. Signatus* Corda, *P. Sternburgi* Corda, *P. trapeziceps* Barr., *P. Volberthi* Barr.

The author discusses:

1. Characteristic of the genera *Phacops* and *Dalmanites*; similar and dissimilar features.

2. The group of *Dalmanites socialis* and their relationship to those of the *Dalmanites Hausmanni*; also to the genus *Phacops*.

3. The group of *Phacops Glockeri* as connecting link between *Phacops* and *Dalmanites*.

4. The probable evolution between the genera *Phacops* and *Dalmanites*.

Holm (G.) Ueber eine neue Bearbeitung des *Eurypterus Fischéri* Eichw.

Acad. Imp. Sci. Bull., St. Petersburg, ser. 5, vol. 4, p. 369.

——— Om förekomsten af en *Pterygotus* i Dalarnes öfversilur.

Geol. För. i Stockholm Förhandl., vol. 19, 1897, p. 475.

Holm (Gerhard). Palaeontologiska Notiser 1-10.

Sveriges Gel. Unders. Afh., ser. C, No. 176, 1902.

Olenellus skifern vid Tomten Ringsaker's socken.

4. Om *Bohemilla*? *denticulata* Linrs. och *Remopleurides microphthalmus* Linrs.
This forms the type of *Robergia*, a new genus by Moberg, 1907.

6. Om förekomsten af en *Pterygotus* i Dalarnes Översilur.

7. Om Angelin's *Bronteus*? *nudus* *Illaenus* (*Bumastus*) *nudus*.

8. Om kinden hos *Illaenus punctillosus* Tornq.

9. Om ett fullständigt exemplar af *Pseudo-sphaerexochus laticeps* Linrs.

Illustrations of *Illaenus punctillosus* Tornq. *Pseudo-sphaerexochus laticeps* Linrs.

——— Palaeontologiska Notiser.

Geol. Foren. i Stockholm Förhandl., Bd. 19, p. 169, 1897.

Ueber *Dikellocephalus* and *Olenellus* Mickwitzi.

——— Palaeontologiska Notiser 13.

Geol. Foren. i Stockholm Förhandl., Bd. 21, Häft 1, 1899.

Om den yttre anatomen hos *Eurypterus Fischéri*, 4 plates.

——— Ueber die organisation des *Eurypterus Fischéri* Eichwald.

Mem. Acad. Petersburg, ser. 3, vol. 8, 1899, pp. 1-57, plates 1-10.

Eurypterus Fischéri Eichwald. *Dolichopterus laticeps* Fr. Schm.

The close similarity approaching identity of *Eurypterus Fischéri* to *E. remipes* and *E. lacustris*, American forms, suggested to Dr. Schmidt that the difference between the Baltic and American forms were only geographical variations arising through migration. With this idea Clarke and Ruedemann have concurred.

Holzapfel (E.) Das obere Mitteldevon in Rheinischen Gebirge, Berlin, 1895.

Proetus Cuvieri Stein, *P. Holzapfeli* Burhenne. Richter refers this to *P. cornutus* Goldf.

Cyphaspis ceratophthalma Goldf.

Houging (Van). Trilobieten und Limulus.

Album der Natuur, 1899, p. 24.

Hussak (E.) Ueber Trilobiten.

Jahresber d'Acad. Naturwiss ver Graz, Jahrg., 1875, pp. 35-36.

Illés von (A.) Magyarországon talált első Trilobita.

Földtani Kozlony, vol. 22, 1902, pp. 351-354.

Griffithides Dobsinensis n. sp., figs a-b.

The author illustrated part of the thorax and pygidium; compares *Griffithides verrucosus* Gemmellaro, 1890.

——— Die erste in ungarn gefundene Trilobite.

Földtani Kozlony, vol. 22, 1902, pp. 408-411, figs. a-b.

The same in the German language.

Illing (V. C.) Notes on certain Trilobites found in the Stockingford Shales.

Brit. Assoc. Adv. Science, 83 Ann. Meeting, Sec. C, 1913.

Abstract in Geol. Mag., Dec. V, vol. 10, p. 452, 1913.

The author remarks that among the fossils found at Hartshill Hayes, numerous forms occur, representing young stages in the development of certain Trilobites. Among these are the following:

1. *Liostracus* sp., similar to one described by G. F. Matthew.
2. *Holocephalina* sp. The early stages of this genus possess a well-marked glabella, widening anteriorly.
3. *Paradoxides Hicksii*.
4. Certain new forms of *Agnostus*.

Jackel (O.) Ueber die Organisation der Trilobiten.

Zeitschr. Deutsch. Geol., Ges. 53, 1901, pp. 133-171, plates 4-6.

——— Ueber verschiedene Wege Phylogenetischer Entwicklung.
Verhandl. des V. Internationalen Zoologen Congresses zu Berlin, 1901, pp. 1058-1117, 28 figures in text.

Evolution of Trilobites, pp. 1086.

The author illustrates *Phacops*, *Agnostus* and *Olenus*, fig. Nos. 20-24.

On the evolution of *Gigantostroaca*, p. 1105.

——— über die Agnostiden.

Zeit. d. Deutsch. Geol. Ges., vol. 61, 1909, pp. 380-401, figures 1-23.

The author proposed *Paragnostus* with *Agnostus rex* as its type. This was the type of Corda's *Condylopyge*. He further proposed *Dichagnostus* with *Agnostus granulatus* as the type duplicating Corda's *Pleuroctenium*. The author gives the name of *Mesagnostus* for *A. integer* Beyr., which was used for Corda's genus *Peronopsis*.

Miagnostus Jackel has the same type species, *A. laevigatus* Dalm., as *Lejopyge* Corda. The new genus *Leiagnostus*, which has the same generic characters as *Phalocroma* Corda.

Metagnostus erraticus and *A. glabratus* have the same short glabella with faint basal lobes as *Agnostus tardus* Barr., which was the type of Corda's *Arthrorhachis*.

Vogdes, in Am. Geol., vol. 9, 1892, p. 395, in his paper on North American species of the genus *Agnostus*, uses this term for section IV.

The author arranges the families as follows:

1. Fam. *Paragnostidae*. *Paragnostus* n. gen., type *A. rex* Barr.

Dichagnostus n. gen., type *A. granulatus* Barr.

Diplagnostus, type *A. planicauda* Ang.

Mesagnostus n. gen., type *A. integer* Barr.

2. Fam. *Metagnostidae*.

Metagnostus n. gen., type *M. erraticus* n. sp.

Hypagnostus n. gen., type *A. parvifrons* Linnrs.

3. Fam. *Agnostidae* sensu stricto.

Agnostus sensu stricto, type *A. pisiiformis* Linné.

Pseudagnostus n. gen., type *A. cyclopyge* Tullberg.

4. Fam. *Leiagnostidae*.

Ptychagnostus n. gen., type *A. reticulatus* Ang.

Miagnostus n. gen., type *A. laevigatus* Dalman.

Leiagnostus n. gen., type *L. erraticus* n. sp.

Jahn (J. J.) Ueber das Tejroviceer Cambrium, Böhmen.

Verhandl. k. k. Geol. Reichs., 1893, p. 271.

Arionellus spinosus n. sp.

This species is illustrated by Pompeckj Die Fauna des Cambrium von Tejrovice, p. 548, pl. 17, figs. 14-20.

Jarosz (J.) Fauna des Kohlenkalk in der Umgebung von Krakau I Teil. Trilobiten.

Acad. d. Wissensch. in Krakau Math. Naturw., Kl., für 1909, 2 Semester, Krakau, 1910.

Jones (T. R.) and **Woodward** (Henry). On some Scandinavian Phyllocardae, Part 2.

Geol. Mag., Dec. 3, vol. 5, 1888, p. 145.

Ceratiocaris Scharyi Barr., *C. pectinata* J. & W. *Phasganocaris puvio* Barr. var. *serrata* J. & W. *Ceratiocaris Angelini* J. & W.

——— Notes on Dr. G. F. Matthew's Cambrian Ostracoda from North-eastern America.

Geol. Mag., Dec. IV, vol. 9, 1902, pp. 401-403.

Outline figures of the genera—Indiana, Bradorona, Beyrichona, Hipponicharion, Bradoria and Escasona.

——— Note on a Palaeozoic Cypridina from Canada.

Geol. Mag., Dec. V, vol. 1, 1904, pp. 438-439, fig.

Cypridina antiqua n. sp.

——— On some Isochilinae from Canada and elsewhere in North America.

Geol. Mag., new ser., Dec 4, vol. 10, 1903, pp. 300-304.

Isochilina gręgraria (Whitf.), var. *Ulrichiana* nov. Tetradella. sp.

——— Some Palaeozoic Ostracods from Maryland.

Johns Hopkins Univ., Circ., 1905, No. 3, pp. 20-33.

——— and **Kirby** (J. W.) Sur une Leperditia (Primitia) nouvelle du calcaire carbonifere de la Belgique.

Ann. Soc. Geol. de Belgique, vol. 20, 1893, plate.

The species described as *Leperditia Dewalquei* is now referred by authors to the genus *Primitia*.

——— Notes on Palaeozoic Bivalved Entomostraca No. xxxii.

Ann. Mag. Nat. Hist., ser. VI, vol. 16, 1895, pp. 452-460, plate.

Bairdia Hisingeri Munster. *Bythocypris cornigera* J. & K. *Phreatura concinna* J. & K. *Cytherella intercalaris* n. sp. *Youngiella rectidorsalis* J. & K. *Bairdia plebeia* Reuss var. *alta* n. var., *B. Hisingeri* var. *contracta* n. var. *Argillaecia* (*Bythocypris*) *aequilis* J. & K. *Bythocypris breviata* n. sp.

——— Quelques Ostracodes fossiles de la Belgique.

Traduit par G. Dewalque, Liege, 1896, plate.

Leperditia Okeni Munster, *L. Okeni* var. *gracillis* n. var., *L. obtusa* n. sp., *L. consorbrina* n. sp., *L. Briarti* Dewalque: *Schmidtella belgica* n. sp. *Primitia Dewalquei* n. sp.

See also Ann. Soc. Geol. de Belgique, vol. 23, 1896.

JONES (T. R.)—Continued

——— On the fossil Cypridinidae and some allied Ostracoda.

Ann. Mag. Nat. Hist., 7th ser., vol. 1, 1898, pp. 333-344, plate.

List of fossil Cypridinidae with illustrations of—

Cypridina primaeva McCoy. *Bradycinctus Rankianus* J. & K. *Philomedes* ? *Bairdiana* J. & K. *Cyprosina Whidbornei* Jones. *Cypridinella MacCoyiana* J. & K., *C. Burrovii* J. & K. *Cypridinella Koninckiana* Jones. *Cyprella annulata* DeKon. *Cypridina* ? (*Leperditia* ? von Toll.) Silurian, *C. ? polonica* (*Bolbozoe* Gurich), Upper Silurian, *C. Grayae* Jones, Lower Silurian, *C. Raisiniae* Jones, Lower Silurian.

——— Contributions to Fossil Crustacea.

Geol. Mag., Dec. IV, vol. 6, 1899, pp. 388-395.

Bellinurus grandaeus n. sp. *Leaia Leidyi* Jones. *Hibbertia orbicularis* gen. et sp. nov.

The genus is placed by the authors along with and nearer to those forms referred to the genus *Cyclus* than with any other group.

Anthrhopalacmon glaber J. & W. *Echinocaris Whidbornei* J. & W. *Estherina ex-tubercata* n. sp.

——— The Eurypterus bearing rocks of the Pentland Hills.

Report Brit. Assoc., 1900, pp. 557-558.

——— Bather (R. A.), and Chapman (F.) On some fossils of Wenlock age from Mulde near Klinteberg, Gotland. With notes by Prof. Jones and Dr. Bather.

Ann. Mag. Nat. Hist., 7th ser., vol. 7, 1901, pp. 141-160, plate.

Family Leperditidae: *Primitia valida* J. & H., also var. *breviata* J. & H. and var. *angustata* J. & H., *P. fabulina* J. & H., *P. elongata* Krause, *P. punctata* Jones, *P. humilis* J. & H., *P. ornata* J. & H., *P. reticristata* Jones, *P. mundula* Jones.

Sub-family Beyrichiinae: *Kloedenia apiculata* Jones, *K. gotlandia* n. sp.

Bollia auricularis Jones. *Beyrichia concinna* J. & H., *B. muldensis* n. sp., *B. Jonesii* Boll., *B. Kloedeni* McCoy, var. *tuberculata* Salter, *B. tuberculata* (Kloeden) var. *lineato-tuberculata* n. var., *B. Bolliana umbonata* Reuter, *B. clavata* Kolmodin.

Family Cytheridae?: *Cythere Finci* Jones ? *Cythere subquadrata* Jones. *Thlipsura plicata* var. *unipunctata* Jones, *T. v-scripta* J. & H. *Aechmina bovina* Jones and var. *punctata* Krause. *Primitiopsis planifrons* Jones.

Family Cyprididae: *Pontocypris Marxii* Jones., *P. Marxii* var. *proxima* Jones.

Family Bairdiidae: *Macrocypris siliquoides* Jones. *Bythocypris symmetrica* Jones, *B. symmetrica* var. *obesa* Jones, *B. phaseolus* Jones, *B. Hollii* Jones, *B. Hollii* var. *oblonga* Jones.

Family Cytherellidae: *Cytherella Smithii* Jones.

Trilobita: *Phacops (Dalmanites) limulurus* Hall (Green's sp.).

The authors illustrate *Beyrichia Muldensis*, *B. tuberculata* var. *lineato-tuberculata* *Kloedenia Gotlandica* n. sp.

Jonker (H. G.) Bijdragen tot de kennis der Sedimentaire Zwerfsteen in Nederland. Contributions to a knowledge of the sedimentary erratic blocks in the Netherlands.

Amsterdam Verh. K. Akad., Wet. 2, part 12, No. 3, 1906, pp. 1-33, pl. 1.

Kayser (E.) Die Fauna des Hauptquartzits und zorger Schiefer des Unter-Harz.

Abhandl. K. Preussischen Geol. Land., vol. 10, 1889, part 1.

KAYSER (E.)—Continued

Phacops Potieri Bayle. *Homalonotus* (*Dipleura*) sp., *H. multicostatus* Koch?.
Cryphacus Lethaeae n. sp. *Cryphacus* sp. *Phacops* aff. *fecundus* Barr.

——— Ueber einige neue order wenig gekannte Versteinerungen des rheinischen Devon.

Zeitschr. Deutsch. Geol. Ges., vol. —, 1889, pp. 288-926, plate.

Phacops (*Trimeroccephalus*) *acuticeps* n. sp.

——— Die Fauna des Dahuaitensandsteins von Kleinlinden bei.

Giessen, Marburg, 1896, 42 pp., 5 plates.

Odontochile hassiaca n. sp., *O.* sp. *Phacops Frechi* Kays. *Cheirurus gibbus* Beyr.
Cyphaspis ceratophthalma Goldf. *Bronteus* (*Thysanopeltis*) *laciniatus* Sandb.? *Phacops* cf. *Sternbergi* Corda.

——— Beitrage zur Kenntniss einiger Palaeozoischer Faunen Sud Americas.

Zeitschr. Deutsch. Geol. Ges., vol. 49, 1897, pp. 274-317, plates.

Liostracus Steimanni n. sp., *L. Ulrichi* n. sp. *Agnostus irugensis* n. sp. *Olenus argentinus* n. sp. *Conocoryphe* (subgen.) *Crepicephalus*.

——— Weiterer Beitrage zur Kenntniss der älteren Palaeozoischen Faunen Sud Amerikas.

Zeitschr. Deutsch. Geol. Ges., vol. 59, 1898, pp. 423-429, plate 16.

Megalaspis sp., *M. Brackebuschi* n. sp., *M. planilimbata* Ang. *Pterygomctopus saltensis* n. sp.

Thysanopyge argentina n. sp. et n. gen.

The new genus was established on a pygidium, similar to that of *Dalmanites caudata* and certain species of *Megalaspis*.

The main peculiarity of this new type consists of the tooth-edged limb of the pygidium, in other features it corresponds with the genus *Megalaspis*.

Keyes (Charles R.) Missouri Geol. Survey, vol. 4, part 1, 1894, Palaeont. Missouri Crustaceans, Chap. X, p. 226.

Lichas Boltoni Bigsby. *Illacnus Graftonensis* M. & W., *I. insignis* ? Hall. *Acidaspis hamata* ? Conrad. *Cyphaspis Girardeauensis* Shumard. *Encrinurus deltoides* Shumard. *Dalmanites tridentifera* Shumard. *Acidaspis Halli* Shumard. *Calymmene senaria* Conrad, *C. rugosa* Shumard. *Ptychoparia conica* ? Billings. *Proetus Missouriensis* Shumard, *P. Szallosi* Shumard. *Phillipsia Sedaliensis* Vogd., *P. Sampsoni* Vogd., *P. tuberculata* M. & W., *P. Missouriensis* Shumard, *P. Meramecensis* Shumard, *P. Portlocki* M. & W., *P. major* Shumard, *P. ? immaturus* Herrick. *Leperditia sublaevis* Shumard. *Solenocaris Sancti-Ludovici* Worthen. *Colpocaris Chesterensis* Worthen.

Plate 32 illustrates *Illacnus insignis*, *Cyphaspis Girardeauensis*, *Dalmanites tridentifera*, *Acidaspis Halli*, *Calymmene niagarensis*, *Phillipsia tuberculata*, *P. Portlocki* and *P. major*.

Kindle (E. M.) and Breger (C. L.) The Stratigraphy and Palaeontology of the Niagara of Northern Indiana. Geol. Sur. Indiana, 28 Ann. Report, 1903, p. 397.

Under the title of Trilobita the authors describe and illustrate (plate XXII-XXIV):

Illacnus armatus Hall, *I. insignis* Hall, *I. ioxus* Hall. *Ceratoccephala goniata* Warner. *Odontopleura ortonii* Foerste. *Encrinurus indianensis* n. sp. *Calymmene Vogdesi* Foerste. *Ceraurus* (*Crotalocephalus*) *niagarensis* Hall. *Sphaerexochus romingeri* Hall. *Phacops* cf. *pulchellus* Foerste. *Dalmanites* (*Synphoria*) *vigilans* Hall.

The new species *Encrinurus Indianensis* of the Niagara Group has a semi-circular cephalon, test tuberculated. Glabella with 3 strong tubercles on each side, anterior to the occipital groove; fixed cheeks separated from the glabella by deep dorsal grooves; genal angles spined; pygidium elongated, triangular, convex; axis 15 joints; lateral ribs 10. Each ring of the axis has 3-5 tubercles, the median one being the strongest.

Compares *E. variolaris*.

Kindle (E. M.) The Onondaga Fauna of the Alleghany Region.

Bull. 508, U. S. Geol. Sur., 1912, 144 pp. with 13 plates.

The author notes and illustrates the following Crustacea:

Phacops rana Green, *P. cristata* Hall, with var. *pipa* Hall. *Cryphacops* cf. *Boothi* var. *calliteles* (Kayser). *Dalmanites* (*Coronura*) *aspetans* Conrad. *Odontocephalus selenurus* (Eaton), *O. aegeria* Hall. *Phaethonides gemmaeus* H. & C. *Conolichas* cf. *hispidus* H. & C. *Cyphaspis* cf. *stephanophora* H. & C. *Lichas* (*Irges*) *contusus* H. & C. var. *Acidaspis callicera* H. & C. *Dalmanites* sp. undet.

Ostracoda: *Bollia ungula* Jones, *B. obesa* Ulrich. *Bythocypris faxulosa* Jones. *Ulrichia conradi* Jones. *Octonaria stigmata* Ulrich. *Leperditia* cf. *subrotunda* Ulrich.

The above list of 13 species contains three trilobites known in the Hamilton fauna. One, *Phaethonides gemmaeus*, is common to the Onondaga and Hamilton faunas in New York. The doubtful species (*Cryphacops* cf. *boothi* var. *callites*) has an occurrence at a horizon, earlier than the Hamilton now first reported. The third *Phacops rana* is one of the very few Devonian trilobites having a wide range.

Kingsley (J. S.) The systematic position of Trilobites.

Amer. Geol., vol. 20, 1897, pp. 33-40.

The author remarks, on p. 34: "Not a single homology can be drawn with any degree of certainty between *Limulus* and any trilobite. The regional divisions are different; the appendages are built upon a different plan, while the larvae of the two groups present but the slightest and most superficial resemblance to each other."

Kliver (M.) Über einige neue Blattinarien, zwei Dictyonera und zwei Arthropleura Arten aus der Saarbrücker Steinkohlenformation.

Paleontographica N. F. IX, pp. 251-265, pl. 34-36, 1883.

Arthropleura armata Jord.

Koenen (A. von). Ueber die Organisation der Trilobiten.

Marburger Sitzber., 1872, pp. 77-78.

Verhandl. d. Naturhist. Ver. d. Preuss. Rheinl. and Westphal. 29 Jhg. (3F. 9 Jhg.). 1872, pp. 93-95.

——— Ueber die Underseite der Trilobiten.

Neues Jahrb. für Mineral, Jhg., 1880, vol. 1, pp. 430-431.

Koninck (L. G.) de Description of the Palaeozoic Fossils of New South Wales (Australia). Translated by Prof. T. W. Edgeworth David, Mrs. David and W. S. Dunn.

Memoirs Geol. Survey N. S. Wales Palaeontology, No. 6, xii, 298 p., 24 plates, 1898.

For list of Crustacea see Mem. Sci. Liège, vol. vii, 1878; also Bibliography of the Palaeozoic Crustacea, Vogdes, p. 128.

Krause (A.) Ueber die Ostrakodenfauna eines holländischen Silur-schichtes.

Zeitschr. Deutsch. Geol. Ges., vol. 48, Jahg., 1896, p. 932, plate XXV.

Ischilina cf. *canaliculata* Krause. *Primitia distans* Krause, *P.* cf. *bursa* Krause. *P. Schmidtii* Krause, *P. elongata* Krause, *P. elongata* var. *obliqua* Steusloff, *P. binodis* n. sp., *P.* cf. *canaliculata* Steusloff. *Entomis* cf. *sigma* Krause, *E.* cf. *obliqua* Krause, *E. oblonga* Steusloff, *E. imperfecta* n. sp. *Placentula Jonesii* n. sp. *Bollia minor* Krause var. *ornata* n. var. *Tetradella harpa* Krause. *Ctenobolina rostratae* Krause, *C. rostrata* var. *cornuta* n. var. *Bythocypris* cf. *symmetrica* Jones.

Krejci (J.) O trilobitech.

Ziva 11, 1854, pp. 83-89, plate 3.

Dalmanites socialis Barr. *Trinnucleus ornatus*, *Acidaspis mira*.

Kutgen (Carl). Die Trilobiten des K. G. H. naturhistorischen Museums.

Publicat de 1, Instit. Roy. grand-ducal Luxembourg, Sec. Sci. Nat. vol. 16, 1877, pp. 127-142.

Proctus Cuvieri Steininger. *Phacops latijrons* Bronn. *Dalmanites caudata* Emm. *Homalonotus platynotus* Daln., *H. delphinocephalus* Murch., *H. laticauda*, *H. Knightii* Koenig, *H. obtusus* Sandb., *H. crassicauda* Sandb. *Calymmene Blumenbachii* Brong.

Lake (Philip). On the British species of *Acidaspis*.

Quart. Jour. Geol. Soc. London, vol. 52, pp. 235-245, plates 7-8.

The author describes and illustrates the following species:

Acidaspis Brighti Murch., *A. coronata* Salter, *A. deflexa* n. sp., *A. crenata* Emm., *A. quinquespinoza* Salt. MS., *A. Barrandei* Fletcher & Salter non Angelin, *A. Hughesi* Salt. MS., *A. crinaceous* Marr & Nicholson, *A. calliparcos* Wyv. Thomson.

The author remarks the British species which have been described have in many cases been imperfectly figured, and the result is endless confusion.

The common English trilobite *Acidaspis coronata* has received abroad no less than three names, all of them different from ours. In England the foreign name *Acidaspis crenata* is often applied to a species which is quite distinct from the original *Acidaspis crenata*.

The author remarks in regard to the synonymy of *Acidaspis coronata* that it is known in England by the name of *A. coronata*, as *A. Marklini* in Sweden, and *A. mutica* in Germany; Murchison's term *quadrimumeronatus* is older than any of them.

Even the name of the genus itself is matter of controversy. Murchison's Silurian System, p. 653, employed the term *Acidaspis*, and in the same year Emmrich, De Tril. Diss. inaug., p. 53, proposed the name *Odontopleura*. This controversy depends on the publication of Murchison's and Emmrich's terms *Acidaspis* and *Odontopleura*.

A copy of Murchison's Silurian System was presented to the Geological Society London, Jan. 9, 1839. This would indicate that the book was published early in January, 1839. Captain Portlock, in his address delivered at the 8th annual meeting, Geological Society of Dublin, Feb. 14, 1839, remarks he had been favored with a copy of the work in sheets, prior to its general publication. Jour. Geol. Soc. Dublin, vol. 2, pt. 1, 1839, p. 29.

Emmrich's paper bears the date, April, 1839.

There is, however, an earlier name still, the use of which has been advocated by Vogdes (Proc. Nat. Sci. Phila., 1877, p. 138); also afterwards by Clarke (10th Rep. N. Y. State Geologist, 1891, p. 61). This name is *Ceratocephala* Warder (Am. Jour. Sci., vol. 34, 1838, p. 377). Dr. Lake remarks that "even if its rival be eligible, *Acidaspis* has been so widely used for so long a time that here at least I do not propose to adopt any other."

LAKE (Philip)—Continued

Warder's species *Ceratocephala goniata* belongs to the same group as *Acidaspis vesiculosa* Barrande.

Beyrich's *Odontopleura Brightii* is identical with *A. quinquespinoza* Salter MS.

——— The Trilobites of the Bokkeveld Beds.

Ann. South African Mus., vol. 4, part 4, 1904, pp. 201-220, 5 plates.

Phacops pupillus n. sp., *P. arbutus* n. sp., *P. crista-galli* Woodw., *P. africanus* Salter, *P. ocellus* n. sp., *P. impressus* n. sp., *P. (Cryphacrus) caffer* Salter. *Phacops* sp. *Dalmanites lumatus* n. sp. *Dalmanites* sp. *Proetus malacrus* n. sp. *Typhoniscus Baini* Salter. *Homalonotus Herscheli* Murch., *H. quernus* n. sp., *H. colossus* n. sp. *Homalonotus* sp.

Several of these species were described by Salter, Trans. Geol. Soc., series 2, vol. vii, 1856; also by Henry Woodward, Quart. Jour. Geol. Soc., vol. xxix, 1873; and by Dr. Frech, who describes a *Homalonotus* which he believed to be new, in *Lethaea Geognostica* Th. 1, Bd. ii, Leif. 1, 1897, p. 218. *H. perarmatus* n. sp.

——— On Trilobites from Bolivia.

Quart. Jour. Geol. Soc. London, vol. 42, 1906, pp. 425-430, plate XL.

Peltura sp. *Symphysurus apolonista* n. sp. *Trinuclens boliviensis* n. sp. *Ogygia*. *Phacops* cf. *arbutus* Lake. *Dalmanites Paituna* H. & R., *D. maccruria* Clarke. *Dalmanites* sp.

The earlier genera show affinities with the contemporaneous European fauna.

The Devonian species are much more closely allied to those of South Africa and North America.

——— The Cambrian Trilobites.

A Monograph on the British Cambrian Trilobites. Palæontographical Society, 1906, part 1, pp. 1-28, plates 1-2.

Agnostus fissus Lundgren, *A. punctuosus* Ang. (The *Agnostus scarabacoides* Salter, as described by Hicks, is clearly only a flattened and imperfect specimen of this species.) The *Agnostus scutalis* Hicks. Quart. Jour. Geol. Soc., vol. 28, pl. v, f. 9, is a beautiful tail of *A. punctuosus* Ang.

Agnostus Davidis Salt., *A. exaratus* Gronwall. (The *Agnostus scutalis* as described by Hicks, Quart. Jour. Geol. Soc., vol. 28, p. 175, pl. v, figs. 12 and 13, and probably figs. 11 and 14, not figs. 9 and 10, includes at least two distinct species. The descriptions of the heads corresponds with Gronwall's species, but the tail is apparently based on a specimen of *A. punctuosus*.)

Agnostus reticulatus Ang., *A. pisiformis* Linne, *A. pisiformis* var. *obesus* Belt, *A. trisectus* Salt., *A. altus* Gronwall, *A. Barrandei* Salt., *A. rotundus* Gronwall, *A. nudus* Beyr., *A. Eskriggei* Hicks, *A. Barlowi* Belt.

Section Limbati: (a) *Regii Agnostus cambrensis* Hicks. (b) Fallaces *Agnostus integer* Beyr., *A. securiger* n. sp., *A. fallax* Linnrs., *A. rudis* Salt., *A. sidenbladhi* Linnrs., *A. calvus* n. sp., *A. dux* Callaway, *A. Callavei* Raw MS., *A. cyclopyge* Tullberg, *A. obtusus* Belt.

Section Parvifrontes: *Agnostus truncatus* Brogger.

——— A Monograph of the British Trilobites.

Part 2, Palæontological Society, 1907, pp. 29-48, plates 3-4.

Agnostus incertus Brogg. *Microdiscus* Salter (non Emmons).

The genus *Microdiscus* was first established by Emmons Am. Geol., vol. 1, pt. 2, p. 116, pl. 1, fig. 8, for a small trilobite to which he gave the name of *Microdiscus quadricostatus*, which Dr. Lake refers to *Trinuclens* and takes Salter's *Microdiscus punctatus* for the type of the genus.

LAKE (Philip)—Continued

Microdiscus lobatus Hall, *M. speciosus* Ford, *M. punctatus* Salter, refers *M. scanicus* Linnrs., *M. eucentrus* Linnrs. to this species. *Microdiscus Sculptus* Hicks. *Shumardia pusilla* Sars (refers *Conophrys salopiensis* Callaway to this species). *Shumardia miqueli* Pompeckî, *S. bottnica* Wiman. (*Acanthopleurella Grindroni* Groom, to this species.) *Shumardia pusilla* var. *moræensis* n. var. *Shumardia* sp. *Orometopus clatiformis* Ang. Refers this genus to the family Trinucleidae as a primitive form. *Orometopus prae-nuntius* Salter (Ampyx Salter, Mem. Geol. Sur., vol. 3, p. 321, pl. 8, fig. 5).

——— A Monograph of the British Trilobites.

Part III, Palæont. Soc. London, 1908, pp. 49-64, plates V-VI.

Olenus truncatus Brünich, *O. gibbosus* Wahl., *O. micurus* Salt., *O. cataractes* Salt., *O. mundus* n. sp., *O. longispinus* Belt. *Parabolina Spinulosa* Wahl. *Parabolinella Williamsoni* Belt.

——— A Monograph of the British Cambrian Trilobites.

Part 4, pp. 65-88, plates vii-x, Palæontographical Society, 1912.

The author describes and illustrates *Parabolinella caesa* nov.; compares it with *P. æilliamsoni*, to which it is closely allied.

Parabolinella rugosa Brögger var., *P. triarthra* Callaway, described by that author under the genus *Olenus* in 1877.

Triarthrus shinetouensis Raw. The species named by Raw, Rep. Brit. Assoc. for 1907, p. 512, without a description or figure.

The author compares it with *T. spinosus* Billings.

Dr. Ami, Trans. Ottawa Field Nat., vol. 1, No. 4, 1882-83, indicates that *Triarthrus spinosus* Billings, had spines on the 8th to 13th segment of the thorax. The English species has 14 segments in the thorax, with the 12th axis ring spined.

Genus *Sphærophthalmus* Angelin.

The author remarks that the genera *Leptoplastus*, *Sphærophthalmus*, *Ctenopyge* and *Eurycare*, form a natural group of the *Olenidae*, characterized by the fact, that the cheek spines do not spring from the posterior angles of the head, but from the middle of the external margin or even from the lateral angles.

Brögger considers that all these forms should be placed in a single genus, which he calls *Leptoplastus*, divided into four subgenera.

The author describes *Sphærophthalmus alatus* Boeck. This species is the same as *Olenus humilis* Phillips, 1848, according to Linnarsson's investigations of original specimen.

Sphærophthalmus major nov.

Ctenopyge: The author does not agree with Brögger and Moberg that only the axial rings are fused, while the pleuræ are free. The pleuræ seem to be closely connected and rarely show any signs of separation.

The author describes *Ctenopyge fusiformis* nov., *C. bisulcatus* Phillips. Salter, taking *Angelin's Sph. alatus* figure as his guide, indicating it with *Olenus bisulcatus* Phillips; therefore this species in English publications means *Ctenopyge bisulcata* or some similar form. *Ctenopyge falcifera* nov., *C. pecten* Salter, *C. expansa* Salter, *C. teretifrons* Angelin, described under the generic name of *Sphærophthalmus*.

Lambert (A. E.) Description of *Dalmanites lunatus*.

Bull. Geol. Soc. America, vol. 15, p. 480, plate 44, 1904.

Lapparent (A.) De Note sur un gisement de Trilobites decouvert par M. Maurice Gourdon aux environs de Luchen.

Bull. Geol. Soc. France, 3rd ser., vol. 8, 1879-1880, pp. 47-48.

Lapworth (Charles). On the discovery of the *Olenellus* fauna in the Lower Cambrian Rocks of Britain.

Geol. Mag. Dec. 3, vol. 5, 1888, p. 484; also p. 190, vol. 6, 1889.

The author remarks: "The remarkable fauna of the *Olenellus* or lowest Cambrian zone originally discovered in America by Dr. Emmons in 1844 (the Taconic system based on observations in New York, Massachusetts, Maine, Vermont and Rhode Island, Albany, 1844, p. 21, *Elliptocephala asaphoides*.) was first recognized in Europe by the late Dr. Linnarsson in 1871 (Ofversigt af Kongl. Vetenskaps Akad. Forhandl., No. 3, p. 790, *Paradoxides Kjerulfi*), in the basal zones of the Cambrian near Lake Mosen in Norway, but its typical genus *Olenellus* was then referred by him to the allied but more recent genus *Paradoxides*.

This reference was corrected by Prof. Brögger in 1875 (Geol. Förening Stockholm Förhandl., vol. 2, 1875, p. 573), and the various brilliant papers on the primordilal formations by this author have given the *Olenellus* fauna a marked and peculiar interest.

In 1882 Linnarsson next made known the existence of the *Olenellus* fauna in Scania at the base of the Swedish Cambrian. In 1886 the same fauna was detected by Mickwitz in the Lower Cambrian of Russia (Esthonia) and this Russian fauna has been lately figured and described by Dr. Schmidt. Dr. Holm has signalized the existence of the *Olenellus* fauna in the Cambrian of Lapland, where it was detected by Morstell in 1885.

The original discovery of the *Olenellus* zone in Europe was made by Dr. A. G. Nathorst in 1868. This species, *Olenellus Kjerulfi*, was named *Paradoxides Wahlenbergi*, Torell Petrefacta Suecana from Cambrica, 1869-70, p. 4, but he did not describe or figure the new form; therefore, *O. Kjerulfi* must be retained for the name of the species.

Laurie (M.) The Embryology of the Scorpion.

Micr. Sci. Quart. Jour. ser., vol. 31, 1890, pt. 2, p. 105.

Euscorpitus italicus.

——— On some Eurypterid remains from the Silurian Rocks of Pentland Hills.

Trans. Roy. Soc. Edinb., vol. 37, 1892, p. 151.

Stylonurus ornatus nov., *S. macrophthalmus* nov., *Eurypterus Scorpiodes* Woodw., *E. conicus* nov., *E. cyclophthalmus* nov. *Drepanopterus pentlandicus*.

——— Recent additions to our knowledge of Eurypterida.

Nat. Sci., vol. 3, 1893, p. 124.

——— The Anatomy and Relations of the Eurypteridae.

Trans. Roy. Soc. Edinb., vol. 37, 1893, p. 509.

——— On some Eurypterid remains from Upper Silurian Rocks of the Pentland Hills.

This author has described in a paper before the British Association, 1892, p. 729, and the Royal Society of Edinburgh between the years 1892 and 1899, Trans. Roy. Soc. Edinb., vol. 38, pt. 1, p. 151, 1893, and vol. 39, 1890, p. 575, four new species to the genus *Eurypterus*, three to *Stylonurus*, and makes a new species of *Silmonia*. He is compelled to make two new genera to receive some more generalized forms. One of these, *Drepanopterus*, comprising three species, combines characters found in *Stylonurus* and *Eurypterus*; and for one species with very generalized characters he makes the genus *Bembicosoma*.

LAURIE (M.)—Continued

Stylonurus ornatus nov., *S. macrophthalmus* nov., *S. elegans*, *S. bembicoides*, *Eurypterus scorpoides* Woodw., *E. conicus* nov., *E. cyclophthalmus* nov., *E. dolichoschelus* nov., *E. minor* nov., *Drepanopterus pentlandicus* nov., *D. bembicoides*, *D. lobatus*, *Slimonia dubia* nov., *Bembicosoma pomphicus* nov.

——— On a Silurian Scorpion and some additional Eurypterid remains from the Pentland Hills.

Trans. Roy. Soc. Edinburgh, vol. 39, pt. 3, p. 575, 1899.

Clarke and Ruedemann remark on this genus that as Eusarcus and the Silurian scorpions are so much alike in their body form they may be assumed to have had similar habits.

Lee (G. W.) A Carboniferous fauna from Nowaja Semlja, collected by Dr. W. S. Brnce, with notes on Corals by R. G. Carruthers.

Trans. Roy. Soc. Edinburgh, vol. 47, pt. 1, 1909, pp. 143-186, 2 plates.

Carboniferous Ostracoda:

Phillipsia Eichwaldi? *Leperditia okeni* Münster. *Bairdia curta* McCoy. *Cytherella*? *inflata* Münster.

——— Note on Arctic Palaeozoic fossils from the Hecla and Fury collections.

Proc. Roy. Soc. Edinburgh, vol. 18, No. 4, 1912, pp. 244-264, text figs.

Ostracoda: *Leperditia phascolus*, L. aff. *balthica* var. *guelphica*, L. cf. *caeca*.

Leriche (Maurice). La faune du Gedinien inférieur de l'Ardenne.

Mem. Mus. Belgique, Bruxelles, vol. 6, 1912, pp. 1-58, plates 1-3.

Ostracoda: *Beyrichia Kloedeni* Primitia Jonesi. *Homalonotus Roemeri* and *Acaste Downingiae*.

The author refers *H. Fialai* Gosselet, 1912, to this species.

Leyh (C. Fr.) Beiträge zur Kenntniss des Paläozoium der Umgegend von Hof a Saale.

Zeitschr. Deutsch. Geol. Ges., 1897, Bd. 49, pp. 504-560, plates 17-18.

The author describes *Dechenella hofensis* n. sp., *Proetus angustigenatus* n. sp., *Phillipsia* cf. *aequalis* H. V. Meyer, *P. Glassi* n. sp., *P. pustulata* Schloth. *Griffithides longicornutus* n. sp., *G. articulatus* n. sp., *G. pupuloides* n. sp., *G. Moroffi* n. sp., *Phillipsia* sp.

Ostracoda: *Beyrichia* aff. *intermedia* J. & H. *Leperditia Okeni* Münst., *L. parallela* J. & K., *L. suborbiculata* Münst. *Cytherella* aff. *inflata*.

Lima (Wenceslau de). Note sur un nouvel Eurypterus du Rothliegendes de Busaco.

Comm. da Comissão dos Trabalhos Geol. de Portugal, Tom. 2, 1890, pp. 153-157, plate.

Lindström (G.) Förteckning på Gotlands Siluriska Crustacéer.

Öfversigt af Kongl. Vetenskaps-Akad. Forhandlingar, 1885, No. 6, pp. 37-100, plates 12-16.

Reviewed Geol. Mag., Dec. 3, vol. 3, 1886, p. 33.

The author describes under Phacops subgenus Dalmanites:

Phacops vulgaris Salt., *P. imbricatula* Ang., *P. obtusa* nov. Subgenus Phacops. *Phacops Downingiae* Murch., *P. quadrilineata* Ang., *P. Musheni* Salt. *Chirurus speciosus* His., *C. conformis* Ang., *C. bimucronatus* Murch., *C. gotlandicus* nov. *Sphaerexochus*

LINDSTROM (G.)—Continued

scarbridus Ang., *S. latifrons* Ang., *S. lacinatus* nov., *S. Beyrichi* nov. Youngia new genus genotype *Cheirurus trispinus* Etheridge and Nicholson.

Cephalon semi-circular with long spines to the genal angles; glabella sub-circular convex truncated posteriorly by occipital furrow overhanging front 3 pairs of lateral furrows to the glabella; occipital ring with long spine; fixed cheeks, small, short, narrow. Pygidium not known.

The author describes as new *Youngia globiceps* and *Y. inermis* *Deiphon Forbesi* Barr. *Encrinurus punctatus* Wahlen., *E. laevis* Ang., *E. obtusus* Ang. *Acidaspis crenata* Emm., *A. Barrandei* Ang., *A. Marklini* Ang., *A. pectinata* Ang., *A. (Trapelocera) bicuspis* Anglin. *Lichas concinnus* Ang., *L. latifrons* Ang., *L. palifer* nov., *L. araneus* nov., *L. ornatus*, *L. marginatus* nov., *L. visbyensis* nov., *L. plicatus* nov., *L. triquetrus* nov., *L. rotundifrons* Ang., *L. gotlandicus* Ang. *Trochurus Salteri* Fletcher.

The generic name of *Trochurus* was used by Beyrich Böhm, Tril., 1845, p. 31, for a composite and artificial species consisting of the head of *Stanocephalus Murchisoni* and the tail of *Lichas palmata* Barr., which the author recognized in the *Untersuch* uber Tril., 1846, p. 10, and declared that the genus did not exist. The name was revived by Lindström in a wider and slightly different sense, giving *Lichas Salteri* as the type, including *Trochurus pusillus* Ang. *Harpes acuminatus* nov.

Calymmene tuberculata Brunnich, *C. spectabilis* Ang., *C. laevis* nov., preoccupied by Munster of a species of *Calymmene* which is now referred to *Phacops* (*C. Lindströmi* nov.) *Calymmene frontosa* nov., *C. intermedia* nov., *C. excavata* nov., *C. papillata* nov. *Homalonotus Knighti* König. *Phacetonides Stokesi* Murch., *P. rugulosus* nov., *P. longifrons* nov. *Cyphaspis elegantula* Ang., *C. punctilosa* nov. *Proetus concinnus* Dalm., *P. obconicus* nov., *P. distans* nov., *P. acutus* nov., *P. conspersus* Ang., *P. signatus* nov., *P. granulatus* nov., *P. verrucosus* nov. *Iliaenus* subgen. *Bumastus barriensis* Murch., *B. Holmi* nov., *B. sulcatus* nov. for *Iliaenus insignis* Holm. *Bronteus platyactin* Ang., *B. Marklini* Ang., *B. polyactin* Ang., *B. irradians* nov., *B. umbonatus* nov., *B. crebristriatus* nov.

Merostomer: *Eurypterus Fischeri* Eichw. *Pterygotus osiliensis* Schm.

——— Ueber die Schichtenfolge des Silur des Insel Gotland. Neues Jahrb. Min. Geol. Pal., Bd. 1, 1888, pp. 147-164.

——— Researches on the visual organs of the Trilobites.

Kongl. Svenska Vetenskaps Akad. Handlingar Bandet 34, No. 8, 1901.

Dr. Lindstrom considers certain nodes on the hypostoma to be visual organs. This is based on the discovery of Dr. Liljevall from the hypostoma of *Bronteus polyactin* Ang. They are located on the inferior edge of the upper groove, close to the lateral margins. To these tubercles he gives the name of "maculae". They are oblong or ellipsoid; their inferior apices bluntly pointed or rounded, two-thirds of their surface is perfectly smooth or glossy, and the lower one-third covered with a compact accumulation of small granules, similar to the facets of the compound eyes of Trilobites. The author, therefore, assumes that they are a pair of small adventive eyes on the exterior side of the hypostoma, from the perfect structural agreement between them and the eyes of the head. The author sums up the literature on blind trilobites without facial ridge; also those with facial ridge, and illustrates the maculae on the hypostoma of 39 genera and 136 species.

The different genera are divided into six groups as follows:

Group 1—In the sectioned maculae there is no tract of any structure. The test of the maculae considerably thinner than that of the hypostoma. According to the affinities of the genera they may be subdivided as follows. a—*Bumastus*, *Dysplanus*. b—

LINDSTROM (G.)—Continued

Nileus, *Symphysurus*? *Ogygia*. c—*Calymmene*, *Homalonotus*. d—*Cheirurus* pro parte.

Group 2—The whole maculae is of a spongy or irregularly polyhedric structure showing prisms in vertical sections. *Asaphus*, *Isotelus*, *Megalaspis*, *Ptychopyge*, *Niobe*? *Megalaspides*? *Barrandia*, *Iliaenus* *Lichas*, *Trochurus*? *Platymetopus* *Encrinurus* also probably belongs to this group.

Group 3—Maculae with well-developed globular lens on the interior third of the maculae; the blank part of the maculae without any structure. In such species as *Cheirurus spinulosus* the whole maculae covered with lenses. *Bronteus*, *Cheirurus spinulosus*.

Group 4—The maculae form sunk pits, with smooth bottom. Structure unknown. *Dalmanites*.

Group 5—The elongate, straight maculae, carrying on their innermost point from 3 to 5 diminutive segregate ocelli, situated on a clear, white patch. *Proetus*. These ocelli have not been observed on the related genera *Cyphaspis*, *Phaetonides*, *Phillipsia* and *Griffithides*, but they may be preliminarily ranked here in consequence of their close conformity.

Group 6—The maculae have in this group been reduced to a pair of tiny ocelli, situated high up on the hypostoma, near its anterior margin. *Phacops*, *Acaste*.

Loomis (F. B.) The dwarf fauna of the pyrite layer at the horizon of the Tully limestone in Western New York.

Bull. New York Mus., No. 69, pp. 892-920, plates iv, 1903.

Cryphaeus Boothi var. *calliteles* Greene, *Beyrichia dagon* Clarke. *Entomis prosenhina* n. sp.

Lorenz (Th.) Beiträge zur Geologie und Paläontologie von Ostasien unter besonderer Berücksichtigung der Provinz Schantung, in China. 2 Paläontologischer Teil.

Zeitschrift der Deutsch. Geol. Ges., 1906, pp. 67-122, with 3 plates and 55 figures in text.

The author attaches classificatory importance to the minute structure and superficial ornamentation of the test, which has led him to change the generic allocation of many well known species, and to institute many new genera.

Lorenz, on account of the different structure or ornamentation of the test, divides the group *Conocephalites* into two genera: *Conocephalina* and *Concephalites*, but the type *C. Emmrichi* Barr. of the latter he puts into the former, thereby making needless confusion. *Conocephalina* Brögger has as its type *C. ornata* Brögger, and the author has referred to it several English species placed by Salter in *Conocephalites*, such as *C. invita*.

The author illustrates *Ptychoparia striata* Em. and places the genus *Solenopleura* as a synonym to *Ptychoparia*, figuring *Solenopleura brachymetopus* Angelin.

The author remarks in regard to the new genus *Lioparia*, that it has medium-sized eyes, in common with both *Ptychoparia* and *Liostracus*; likewise the deep dorsal furrow of *Ptychoparia*. In relation to the shell structure and the flat selvage, it is on the side of *Liostracus*. On careful consideration one must admit that *Liostracus* is in closer relation to the species *Lioparia*, than that of the genus *Ptychoparia*.

He refers *Conocephalites minutus* Hall to the genus, and uses *Lioparia latclimbatum* Dames, with one new species, *L. blautocides*, as the type of the genus.

Trachyostracus new genus: Is distinguished by medium-sized wide-apart eyes flat selvage and little or no dorsal furrows. In its outer form it is not to be distinguished from *Liostracus*. The difference in the genera lies alone in the different shell struc-

LORENZ (Th.)—Continued

ture. *Trachyostracus* has a thick, rough shell; *Liostracus* a smooth, finely porous shell. These two genera exhibit a rare case of convergence.

Examples of this species are the two following forms: *Solenopleura Hozcleyi* Walc. and *Ptychoparia limbata* Matt.

Under *Liostracus* Angelin, as emend. by Brögger, the author includes *Liostracus microphthalmus* Ang., fig. 4. *Ptychoparia Piochensis* Walcott. *Anomocare planum* Dames. *Liostracus Linnarssoni* Brögger, *L. aculeatus* Ang.

Macrotoxus n. gen.: The principal characteristics consist in the very long arch-shaped eyes, the deep dorsal furrows and the thick, rough shell. The author refers *Anomocare Angelini* Grönwall and *Conocephalites perseus* Hall to the genus.

Alokistocare new genus: This genus has in common with *Macrotoxus* the long, arch-shaped eyes, and the long dorsal furrow around the glabella. By its porous shell it is differentiated from the former. The author refers *Ptychoparia subcornata* H. & W. to this genus.

Megalophthalmus new genus: Also here are the long, arch-shaped eyes the principal element. The glabella does not lie deeply in the head shield, but comes out high over the cheeks. Even trace of dorsal furrows is lacking. The shell is thick, rough, not porous.

The author refers *Liostracus megalurus* Dames and *Anomocare minus* Dames to this new genus, remarking that it is not improbable that this group is also distributed in North America. In its external appearance it resembles throughout the old Swedish species of *Anomocare*. The last, however, has a highly porous shell.

Under the genus *Anomocare* the author includes *Anomocare latelimbatum* Dames, *A. excavatum* Ang., *A. limbatum* Ang. *Liostracus Maydelli* Schmidt, *Anomocare commune* n. sp. and *A. laeve* Ang.

The author places *Conocephalina* Brögger and *Conocephalites* Barrande, under two groups, on the difference of the ornamentation of the test, using *Ptychoparia Emmrichi* for the type of the first genus, with granulated shell; and *Concephalites ornatus* Brögger for the second genus, although Brögger used this for his type.

The author figures *Ptychoparia Emmrichi* Barr. also *Conocephalites ornatus* Brögger and *C. suecicus* Wallerius.

The author gives the following description of the new genus *Amphoton* with the species *A. Steinnanni* for its type:

Glabella narrow, highly cylindrical, with deep furrows. On both sides of the high glabella wing-shaped, similuna-shaped cushions, that resemble ears on a great elephant head. The eyes are long, box-shaped and stand upright. The anterior eye corners lie close to the glabella. The facial sutures follow the eye lobes, diverging slightly from the anterior eye corners to the frontal margin. From the rear eye corners it branched outwardly into a horizontal piece before it cuts through the rear margin; thereby forms a small band attached to the rear of the cheek. Close to the front end of the glabella is a narrow, flat, bent-up edge. The pygidium greatly resembles that of *Anomocare*, for in a slab of fossils from Laiwa, are found numerous head shields of this species, corresponding to head and tail shields of *Anomocare*.

On page 91, the author describes *Anomocare commune* n. sp. (referred by Walcott to *Anomocarella chinensis* Walcott); also *Anomocare oratum* n. sp. and *A. speciosum* n. sp. (referred by Walcott to the genus *Anomocarella*).

The author includes a description of *Olenus* sp. *Ptychoparia* (*Solenopleura*) sp., and the description of a new genus *Schantungia*, with *S. Buchruckeri* for its type (this has been referred by Walcott to *Chuangia nitida*).

The other fossil crustacea described in this work are: *Schantungi Monkei* n. sp. *Liostracus latus* n. sp. *Agnostus fallax* Linrs. var. *Laiwuensis* n. var., *A. parvifrons*

LORENZ (Th.)—Continued

Linrs. var. *latelimbatus* n. var. *Asaphus Boehmi* n. sp. *Lioparia latelimbata* Dames (*Inomocare latelimbatum* Dames) *Teinistou* sp. *Drepanura* sp. and hypostoma of *Anomocare*.

Lucas (H.) Otarion et Paradoxie.

Articles du Dictionaire Universel d'Hist. Nat., dirigé par Ch. d'Orbigny, 1847.

Macconochie (A.) Discovery of Organic remains in the Old Red Sandstone of Lorne.

Summary of Progress for 1897, Mem. Geol. Sur. of Great Britain, pp. 82-83.

Macnair (P.) The geology of the Rouken Glen and its neighbourhood.

Glasgow Trans. Geol. Soc. 12, 1906, pp. 362-397, pl. ix-x.

Mailleux (Eugene). Quelques mots sur les Trilobites du Couvinien des environs de Couvin.

Bull. de la Soc. Belge de Geol., vol. 17, 1904, pp. 579-585.

The author describes a new species of *Proctus Barroisi* with figures; also gives a list of species occurring near Couvin.

Mansfield (J. F.) Note on Eurypterus from the Darlington Shales, Penn.

Am. Philos. Soc. Proc., vol. 19, 1881, p. 352.

This species is classified by Clarke and Ruedemann under the subgenus *Anthracontes*.

Mansuy (H.) Etude géologique du Yun Nan oriental IIe partie Palaeontolog.

Mem. service geol. l'Indo-Chine, vol. 1, 1912, pp. 1-146, pl. 1-25.

The author describes the following crustaceae:

Ostracods: *Bradoria douvillieri* Mansuy, *Aluta* sp. Nothozoe.

Trilobites: *Redlichia chinensis* Wale., *R. nobilis* Wale., *R. Halcotti* Mansuy, *R. carinata* Mansuy, *R. sp. Palaeolenus douvillieri* n. sp. and gen., *P. lantenoisi* Mansuy, *P. deprati* Mansuy, *Ptychoparia yunnanensis* Mansuy. The new genus *Palaeolinus* is allied to *Agraulos*.

Matthew (G. F.) Traces of the Ordovician on the Atlantic coast.

Trans. Royal Soc. Canada, vol. 1, 1893, p. 253.

Holasaphus centropyge n. gen. et sp.

——— Organic remains of the Little River Group, No. IV.

Trans. Royal Soc. Canada, vol. 1, section iv, 1895, pp. 273-279, plate.

Amphipeltis paradoxus, Salter.

——— The Protolenus Fauna.

Trans. New York Acad. Sci., vol. 14, 1895, pp. 101-153, plates.

Ostracoda: *Hipponicharion eos* Matth., *H. cavatum* Matth., *H. minus* Matth. *Beyrichona papilio* Matth., *B. linea* Matth., *B. planata* n. sp., *B. triangula* n. sp., *B. ovata* n. sp., *B. rotundata* n. sp. *Aparchites secunda* n. sp., *Primitia aurora* Matth., *P. oculata* n. sp., *P. ? fusiformis* n. sp. *Schmidtella cambrica* n. sp. *Leperditia ? ventricosa* Matth., *L. ? Steadi* Matth., *L. ? minor* n. sp., *L. ? primeava* n. sp.

Phyllopoda: *Leperditia sigillata*, Matth.

MATTHEW (G. F.)—Continued

Trilobita: *Protagraulus priscus* n. sp. *Ellipsocephalus galeatus* Matth., *E. grandis* Matth., *E. sp.* *Avalonia acadica* n. sp. *Micmacca Matthevi* n. gen. et sp., *M. Van Ingeni* n. sp., *M. recurva* n. sp., *M. ? plana* n. sp. *Protolenus paradoxides* Matth., *P. bi-tuberculatus* n. sp. *Bergeronia* n. subgen., *B. elegans* W. D. Matthew, *B. aricephala* Matth.

——— Fauna of the Paradoxides beds in Eastern North America.

Trans. New York Acad. Sci., vol. 15, 1896, pp. 191-247, plates.

Phyllopoda: *Leperditia alata* Matth., *L. curta* Matth., *L. auriculata* Matth.

Ostracoda: *Primitia acadica* Matth., *Aluta flexilis* n. gen. et sp.

Cirripedia: *Plumulites Manuclensis* n. sp. *Stenothecca concentrica* Matth. and var. *radiata*, *S. triangularis* Matth., *S. nasuta* Matth., *S. Hicksiana* Matth. *Cirripodites cam-breensis* n. gen. et sp.

Trilobita: *Agnostus regulus* Matth., *A. rex* Barr. var. *transectus* n. var., *A. jallax* Linsr.; also var. *vir* n. var. *concinus* n. var. and *trilobatus* n. var., *A. Acadicus* Hartt var. *declivis* n. var., *A. parvifrons* Linsr. var. *tessella* n. var. *truncatus* n. var., *A. umbo* Matth., *A. obtusilobus* Matth., *A. Davidis* Salt., *A. gibbus* Linsr. var. *partitus* n. var. *acutilobus* n. var., *A. Nathorsti* Br. *confluens* n. var., *A. fissus* Lund. *trifissus* n. var. *A. punctuosus* Ang., *A. laevigatus* Dalm., *A. terranovicus* n. var. *ciceroides* n. var., *A. mamilla* n. var., *A. nudus* Beyr. *Microdiscus Schucherti* Matth., *M. precursor* Matth., *M. Dawsoni* Hartt, *M. pulchellus* Hartt, *M. punctatus* Salter.

——— On *Microdiscus*.

Amer. Geologist, vol. 18, 1896, p. 30.

Microdiscus Schucherti n. sp.

——— Studies on Cambrian Faunas (No. 1).

Trans. Royal Soc. Canada, vol. 3, Sec. iv, 1897, pp. 165-203, 4 plates.

Agnostus Nathorsti Br., *A. fissus* Lund., *A. punctuosus* Ang., *A. parvifrons* Linsr. cf. var. *nepos* Br., *A. umbo* Matth., *A. laevigatus* Dalm. *Microdiscus pulchellus* Hartt? *Conocoryphe pustulosa* n. sp.

Matthews in his division of this genus, Studies on Cambrian Faunas No. 3, p. 89, uses for dwarf species with large glabella and apical spine to the front margin, suture within the rim, the term *Cainatops*, with this species as the type.

Paradoxides abenacus Matth. *Agraulos ceticephalus* Barr. var. *carinatus* n. var., *A. holocephalus* Matth., *A. Roberti* n. sp., *A. ? nanus* n. sp., *A. pusillus* n. sp. *Liostracus validus* n. sp. *Ptychoparia limbata* n. sp., *P. Adamsi* Bill. *Solenopleura arenosa* Bill. var. *angulimbata* n. var., *S. Robbii* mut. *parva*. *Anomocare magnum* Br. *Dolichometopus Acadicus* n. sp. *Dorypyge Wasatchensis* H. & W., also var. *Acadicus* n. var., *D. quadriceps* H. & W. var. *valida* n. var., *D. horrida* n. sp.

——— Billings's Primordial Fossils of Vermont and Labrador.

Trans. Royal Soc. Canada, vol. 3, Sec. iv, 1897, pp. 194-200.

Bathyniscus Meek *B. senectus* Bill. *Dorypyge parvula* Bill. *Anomocare Tucer* Bill. *Ptychoparia Adamsi* Bill. *Solenopleura arenosa* Bill. *Conocephalites miser* Bill. *Dorypyge parvula* Bill. var. *angifrons* n. var.

——— What is the Olenellus fauna?

Am. Geol., vol. 18, 1897, p. 396.

Proposes the subgenus *Callavia* type *O. Bröggeri* Walc. and *O. callavii* Lapworth, because the glabella differs from *O. Kjerulfii*.

——— Some characteristic genera of the Cambrian.

Address Brit. Assoc., 1897, Geol. Mag. London, Decade iv, vol. 5, 1898, pp. 82-83. The specie and genera have been described in other papers by this author.

MATTHEW (G. F.)—Continued

——— Recent discoveries in the St. John Group, No. 2.

Bull. Nat. Hist. Soc., New Brunswick, No. xvi, 1898, pp. 32-34, plate.

Protolenus elegans n. sp., *P. paradoxoides* n. sp. *P. articephalus* n. sp., *Ellipsocephalus galeatus* n. sp. *Olenus Zoppi* Menigh.

——— Studies on Cambrian faunas, No. 2.

Trans. Royal Soc. Canada, vol. 4, Sec. iv, 1898, pp. 123-150, 2 plates.

Ostracoda: *Primitia pyriformis* n. sp. *Aparchites ? robustus* n. sp. *Beyrichia ? primæva* n. sp.

Trilobita: *Protagraulos priscus* Math. *Micmacca Van Ingeni* Math. *Agnostus pisiformis* with variations. *Anomocare stenotoides* Math. *Olenus* (subgen. *Acantholenus*) n. subgen. *Acantholenus spinger* Math.

——— A new Cambrian Trilobite.

Bull. Soc. N. B., vol. 4, 1899, pp. 137-142, plate.

Metadoxides magniferus n. sp.

——— Studies on Cambrian faunas, No. 3. Upper Cambrian fauna of Mount Stephen, B. C.

Trans. Royal Soc. Canada, vol. 5, Sec. iv, 1899, pp. 39-66, 7 plates.

Agnostus montis n. sp. *Ptychoparia cordillerae* Roem. *Conocephalites (Conaspis?) cf. perseus* Hall. *Corynexochus Roemingeri* Math. *Dolichometopus occidentalis* n. sp. *Bathyriscus Howelli* Walc., *B. pupa* n. sp. *Neolenus serratus* n. gen. et sp., *N. granulatus* n. sp. *Dorypyge Dawsoni* Walc. *Zacanthoides spinosus* Walc. *Ogygia (Ogygopsis) Klotzi* Roem. *Oryctocephalus Walkeri* n. sp.

——— Studies on Cambrian faunas, No. 4. Fragments of the Cambrian faunas of Newfoundland.

Trans. Royal Soc. Canada, vol. 5, Sec. iv, 1899, pp. 67-96.

Microdoscoelus bellimarginatus S. & F. *Agraulos (Strenuella) strenua* Bill. mut. *robusta* n. mut., *S. Attleboroensis* S. & F. mut. *vigilans* n. mut. *Micmacca Halcotti* n. sp., *M. angimargo* n. sp. *Avalonia plana* n. sp., *Protolenus Howleyi* Walc. *Metadoxides magnificus* Math. *Atops trilineatus* Emm. *Erinnys breviceps* Angelin.

——— The Etcheminian fauna of Smith Sound, Newfoundland.

Trans. Royal Soc. Canada, vol. 5, Sec. iv, 1899, pp. 97-119, plates.

Aptychopsis terranovicus Math. mut. *arcata*.

——— Preliminary notice of the Etcheminian fauna of Newfoundland.

Bull. Nat. Hist. New Brunswick, No. 18, vol. 4, 1899, Article 1, pp. 189-197, plate 1-3.

Aptychopsis terranovicus.

——— Preliminary notice of the Etcheminian fauna of Cape Breton.

Bull. Nat. Hist. New Brunswick, No. 18, vol. 4, 1899, Art. 2, pp. 198-208, plates 1-4.

Bradoria n. gen., *B. scrutator* n. sp., *B. vigilans* n. sp., *B. rugulosa* n. sp. *Schmidtella ? perætes* n. sp., *S. acuta* nov.

The peculiarities of this fauna as distinguished from the Cambrian are the following: 1—Great preponderance of Hyolithidae. 2—Absence or rarity of Trilobites. 3—Minuteness of the Gasteropods, except Capulidae. 4—Minuteness of the Brachiopods. 5—Minuteness of the Crustaceans.

——— Cambrian rocks and fossils of Cape Breton.

Geol. Sur. Canada, n. ser., vol. 14, 1901, pp. 223-224.

Gives the leading genera of the several groups.

MATTHEW (G. F.)—Continued

——— Additional notes on the Cambrian rocks of Cape Breton.

Bull. Nat. Hist. Soc. New Brunswick, No. 20, vol. 4, 1902.

Parabolinella quadrata n. sp. *Triarthrus belli* n. sp. *Angelina* ? sp. *Asaphellus Homfrayi* var. a, *A.* ? *planus*.

——— Ostracoda of the basal Cambrian rocks in Cape Breton.

Canadian Record of Science, vol. 8, No. 7, 1902, pp. 437-468, 2 p. with 2 plates.

Leperditia rugosa n. sp. *Bradorona* n. sub. gen., *B. perspicator* n. sp. mutation *maxima*, *magna*, *major*, *B. spectator* n. sp., also var. *acuta*, mutation *spinosa*, *aequata*, *B. observator* n. sp. and var. *benepuncta*, *laevis*, *ligata*. *Bradoria scrutator* Matth., *B. vigilans* Matth. mut. *obesa*, *B. rugulosa* Mauth., *B.* ? *ornata* n. sp. *Escasona* n. gen., *E. rutellum* n. sp., *E.* ? *vetus* n. sp., *E.* ? *ingens* n. sp. *Indiana* n. gen., *I. ovalis* n. sp. mut. *prima*, *I. lippa* n. sp. *Schmidtella* ? *pervetus* Matth. mut. *concinna*, *S. acuta* Matth.

The author remarks that the *Bradoria* do not have the medium pit or sulcus of *Primitia*, the shallow median depression of *Primitella*, or the smooth valve of the *Aparchites*. Their most marked character is a prominence or tubercle just at the front of the hinge line.

——— Report on the Cambrian rocks of Cape Breton.

Geol. Survey of Canada, 1903, 246 pp., 18 plates.

Ostracoda of the basal Cambrian rocks in Cape Breton:

Leperditia ? *rugosa* Matth. *Bradorona perspicator* Matth. mutations *maxima*, *magna*, *Major* *B. spectator* Matth. mutations *acuta*, *spinosa*, *aequata* *B. observator* Matth. also var. *benepuncta* mutations *laevis*, *ligata*. *Bradoria scrutator* Matth., *B. vigilans* Matth. *obesa*, *B. rugulosa* Matth., *B.* ? *ornata* Matth. *Escasona rutellum* Matth., *E.* ? *vetus* Matth., *E.* ? *ingens* Matth. *Indiana ovalis* Matth. mutation *prima*, *I. lippa* Matth. *Schmidtella* ? *pervetus* Matth. mutation *concinna*, *S.* ? *acuta* Matth.

Trilobita: *Holasaphus centropyge* Matth. Paradoxidoid trilobite. *Solenopleura Bretonensis* n. sp. Eurypteroid crustacean?

Faunas of the St. John terrane.

Ostracoda: *Beyrichia triceps* n. sp.

Trilobita: *Agnostus trisetus* Salt. mut. *ponepunctus* Matth. mut. *germanus*, *A.* cf. *cyclopyge* Tullb., *A.* cf. var. *declivis* Matth. *Parabolina Dawsoni* Matth., *P.* ? *quadrata* Matth., *P.* cf. *limitis*, Br. *Spaerophthalmus Fletcheri* Matth., *S. alatus* Boeck. *Ctenopyge pecten* Salt. *Peltura scarabaeoides* Wahl. *Triarthrus Belli* Matth. *Angelina* ? *Asaphellus Homfrayi* Salt., *A.* ? *planus* Matth.

——— Remarkable forms of the Little River Group.

Trans. Roy. Soc. Canada, ser. 3, vol. 3, 1909, Sec. iv, pp. 115-125, plates 1-4.

Leaia silurica n. sp.

This species is allied to *L. Leidyi* of the Coal Measures of Pennsylvania, but has fewer concentric ridges.

Belinuropsis Wigudensis n. sp. et gen.

This crustacean is of the general type of *Belinurus*, but differs in its peculiar notched posterior border, the intergenal spine or flap, and the very narrow axis to the thorax, with seven instead of five segments as in *Belinurus*.

Maurer (F.) *Nathrage zur Fauna und Stratigraphie der Orthocerasschiefer der Ruppachthales.*

Neues Jahrb. für Mineral Geol. Beil., vol. 10, pp. 613-756, plates.

Phacops fecundus Barr. *Cryphaeus acutifrons* Schluter. *Acidaspis pigra* Barr. *Bron-teus* sp. and *Leperditia rhenana* n. sp.

——— Der Quartzeit von Neuweilnau.

Ber. d. Senckenb. Naturf. Ges. in Frankfurt, 1902, pp. 27-82, plates 3-5.

Gives figures of the head and tail of *Homalonotus striatus* nov. Head of *H. ornatus* Koch and tail of *Homalonotus multicostatus* Koch.

McCoy (F.) Note on a new Australian *Pterygotus*.

Geol. Mag., Decade iv, vol. 6, 1899, pp. 193-194.

Pterygotus australis n. sp.

The species resembles *Pterygotus bilobus* Salter.

Meyer von (H.) *Jonotus reflexus* ein Trilobit aus der Grauwacke der Eifel.

Dunker and Meyer Paläontologica, vol. 1, p. 182, pl. 26, fig. 1a-b, 1848.

This new generic name given for *Harpes reflexus*, Hoeninghaus, 1847. Dr. Von Meyer copies Hoeninghaus' figures.

Michleborough (John). Locomotory appendages of Trilobites.

Geol. Mag., Decade 3, vol. 1, 1884, pp. 80-84, woodcuts on p. 162, figs. 1-3.

Asaphus megistos.

Miller (S. A.) and **Gurley** (W. F. E.) New species of Echinodermata and a new Crustacean from the Palaeozoic Rocks.

Illinois State Museum Bull. No. 10, 1896.

The authors describe *Eurypterus kokomoensis* n. sp.

Clarke & Ruedemann Mem. N. Y. State Mus., No. 14, p. 212, place this under a new subgenus *Onychopterus*.

Moberg (J. C.) Anteckningar om Olands orthocerkalk.

Sver. Geol. Under. Ser. C, No. 109, 1890.

Asaphus platyrus maximus n. var.

——— Om en afdelning inom Olands dictyonemaskiffer såsom motsvarighet till ceratopygeskiffern i Norge.

Sver. Geol. Under. Ser. C, No. 109, 1890.

Shumardia pusilla Sars.

——— Om den af *Trinucleus coseinorrhinus* Karakteriserade kalken geologiska ålder.

Sver. Geol. Unders., Ser. C, No. 125, Geol. Foren. Forh., 14-5, 1892.

Nileus armadillo var. *cornutus* n. var.

——— Till frågan om pygidiets byggnad hos *Ctenopyge pecten* Salter.

Geol. Fören. Förhandl., vol. 14, 1892, pp. 351-355, figures.

——— Silurisk Posidonomyaskiffer en egendomlig utbildning af Skånes oversilur med I tafla.

Sver. Geol. Unders., ser. C, No. 156, 1895.

Eoconchoecia n. gen., *E. mucronata* n. sp., *E. ? imbecilis* n. sp. *Cypridina Tosterupi* n. sp., *C. ? obtusa* n. sp., *Colpos insignis* n. sp. et gen. *Primitia mundula* Jones var. *Beyrichia Steusloffii* Krausi, *B. Salterina* Jones.

MOBERG (J. C.)—Continued

——— Supplement till Om Acerocarezonen.

Geol. Fören. i Stockholm Förh., Bd. 20, No. 5, 1898.

Acerocare claudican n. sp., figured.

——— En trilobit från Skånes Dictyograptusskiffer.

Geol. Fören. Förh., Bd. 20, No. 6, 1898, plate XVII, pp. 317-324.

Hysteroleenus Tornquisti n. sp. et gen.

——— En trilobit från Skånes Dictyograptusskiffer Meddel. No. 5.

Fr. L. G. F. Geol. Fören., i Sthlm. Förh., Bd. 20, 1898.

Shumardia oelandica n. sp., p. 357, pl. 14, figs. 4-6.

Hysteroleinus Tornquisti n. sp., p. 318, pl. 17, figs. 1-9.

——— Sveriges äldsta kända Trilobiter.

Geol. Fören. Förhandl., vol. 21, 1899, pp. 309-348, plates 13-15.

Georgiellus (Elliptocephala) asaphoides Emmons. *Olenellus Thompsoni* Hall. *Holmia Kjerulfi* Linnr. *Holmia Lundgreni* Moberg. *Mesonacis Vermontana* Hall. *Schmidtia Mickewitzii* Schmidt. *Schmidtia ? Torelli* Moberg. *Olenelloides armatus* Peach.

The original discovery of the *Olenellus* zone in Europe was made by Dr. A. G. Nathorst in 1868, Öfvers Kongl Vetens. Akad Förhandl., 1869, p. 64, in which he described a new and distinct horizon below the *Paradoxides* beds at Andrarum, Scania, containing trails and *Lingula*. The species now known as *Olenellus Kjerulfi* Linnr. was named *Paradoxides Wahlenbergi* by Torell in his *Petrefacta Suecana Formationis Cambriae*, 1869-70, p. 4, but he did not describe or figure the new species.

——— Nya bidrag till utredning af frågan om gränsen mellan undersilur och kambrium.

Geol. Fören. i Stockholm Förh., Bd. 22, 1900.

Dicelloccephalina dicracura Ang. *Shumardia oelandica* Mbg.

——— Bidrag till kännedom om Trilobiternas byggnad.

Fören. Förhandl., vol. 24, 1902, pp. 295-302, plate 3.

Nileus armadillo Dalm.

From an example of *Nileus armadillo* Moberg shows the point of attachment of the muscles of the antennae, hypostoma epistome and several limbs of his species; eyes with 3,000 to 4,000 facets. He takes exception to Lindström, that the maculae on the hypostome carry organs of vision and that of the earlier *Olenidae* were blind.

——— *Schmalenseccia Amphionura* en ny Trilobit typ Meddelanden.

Lund. Geol. Mineral Inst., No. 5, Stockholm, 1903.

——— Om *Robergia microphthalma* Linnr.

Geol. Fören. Förhandl., Bd. 28, Haft 2, p. 83, 1907.

——— Ett par bidrag till kännedom om Skånes dicellograptusskiffer.

Geol. Fören. Förhandl., Bd. 29, Häft 2, Feb., 1907, p. 75.

Robergia microphthalma Linnr.

This new genus was founded on *Remopleurides microphthalmus* Linnr.

Geol. Fören. Förhandl., 1875, No. 26, Bd. 2, No. 12, p. 494, pl. 1, f. 3.

——— Om ett gätfyllt fossil från Sveriges olenidskiffer samt en kort öfversigt af viktiga data rörande trilobiternas ventrala skelettdelar.

Geol. Fören. i Stockholm Förh., Bd., 29, 1907, No. 5.

MOBERG (J. C.)—Continued

——— *Acglina umbonata* Angelin.

Lund's Geologiska Fältkubb., No. 12, 1907, Bd. 29, pp. 257-264, pl. 3.

The author refers *Corynexochus ? umbonatus* Ang. Palæont. Scand., p. 60, pl. 33, fig. 10, to this species; also *Æglina rediviva* Barrande. Syst. silur. Bohm, vol. 1, Suppl., p. 64, pl. 14, fig. 11.

——— Historical Stratigraphical Review of the Silurian of Sweden.

Sveriges Geol. Undersökning, Sec. C, Nos. 229-202, pp. and map.

——— and Gronwall (K. A.) Om Fyledalens Gottlandium.

Lund Geologiska Fältkubb., Ser. B, No. 3, 1909, 84 pp., with 6 plates.

The authors describe and illustrate the following fossil Crustacea: *Lepreiditia inaequalis* Grönw. referring to it the following species: *L. Angelini* (Fr. Schmidt).

Lundgren Lund's Univ. Arsskr., Bd. 10, p. 9.

L. tyraica (Fr. Schmidt) Linnarsson, *L. phoscolus* (Hisinger).

Schmidt Misc. Silurica, No. 3, p. 9, as syn.

Aparchites obsoletus Jones and Holl. *Primitia mundula* Jones.

Beyrichia Buchiana Jones, *B. cuspidata* Grönw., *B. Kochi*. Boll; *B. Maccoyiana* Jones, referring *B. cincta* and *B. elegans* Boll, 1862, to this species.

Beyrichia nodulosa Boll, referring *B. spinulosa* and *nodulosa* Boll; also *B. dubia* Reuter, 1885, and *B. Lindstromi* cum var. *expansa* Kiesow, 1888, as syn. to the species.

Beyrichia obsoleta Grönw., 1897, *B. Salteriana* Jones, *B. scanensis* Kolmodin, referring *Beyrichia hians* Boll, 1856, to this species. *Beyrichia Steusloffii* Krause, 1891. *Kloedenia Kiesowi* Krause. This is the unnamed sp. of Angelin's, pl. A, figs. 16 and 17.

Beyrichia Wilkeusiana Jones and var. *plicata* Jones. *Thlipsura tetragona* Krause, 1891. *Cytherellina siliqua* Jones. *Bythocypris triangularis* Grönw., 1897. *Phacops Dowsningiae* Murch. *Calymene intermedia* Lindstr., 1885. *Homalonotus Knighti* var. *rhinotropis* Ang. *Ceratiocaris* sp. and *Pterygotus* sp.

——— and Møller (H.) Om Acerocarezonen ett bidrag till Kännedomen om Skånes olenidskiffrar.

Geol. Fören. Förhandl., vol. 20, 1898, pp. 197-290, plates 10-14.

Acerocare corne Ang., *A. micropygum* Linnr., *A. granulatum* n. sp., *A. paradoxum* n. sp., *A. Tulbergi* n. sp., *A. claudicans* n. sp. *Parabolina acanthura* Ang., *P. heres* Br., *P. megalops* n. sp. *Acerocare norvegicum* n. sp.

——— and Segerberg (Carl O.) Bidrag till Kännedomen om Cera-
topygeregionen med särskild hänsyn till dess utveckling i Fogelsång-
strakten.

Kongl. Fysiogr. Sällsk. Handl., Bd. 17, No. 7, 1906.

Crustacea: *Eremos bryograftorum* Wgd., msr. n. gen. et n. sp. *Primitia ostragothica* n. sp. *Beyrichia nana* Brögg., *B. nanella* Mbg. n. sp. *Ceratiocaris scanicus* n. sp. *Agnostus Sidenbladhi* var. *urceolatus* Shg. msr. n. var., *A. trinodus* Salt., *A. fossulatus* n. sp. *Shumardia oelandica* Mbg., *S. pusilla* Sars., *S. bottnica* Wiman, *S. Dicksoni* n. sp. *Parabolinella limitis* Brögg., *P. rugosa* Brögg. *Boeckia Mobergi* Wiman. *Acerocare norvegicum* Mbg. and Møller. *Triarthrus Angelini* Linnr. *Hysteroleenus Torquisti* Mbg., *H. ? laevicauda* n. sp. *Euloma ornatum* Ang. *Harpides rugosus* S. & B. *Ceratopys forficula* Sars., *C. latelimbata* n. sp. *Dicelloccephalus Bröggeri* n. sp. *Apatocephalus serratus* S. & B., also var. *dubius* n. var. *Dicelloccephalina dicracura* Ang. *Symphysurus angustatus* S. & B., *S. incipiens* Brögg., *S. breviceps* Ang., *S. elongatus*

MOBERG (J. C.) and SEGERBERG (Carl O.)—Continued

n. sp. *Nileus armadillo* Dalm., *N. limbatus* Brögg. *Niobe insignis* Linrs., *N. insignis* var. *angustifrons* Shg. n. var., *N. obsoleta* Linrs., *N. laeviceps* Dalm. *Megalaspis intacta* n. sp., *M. stenorhachis* Ang., *M. planilimbata* Ang. *Illacenus oriens* n. sp. *Orometopus elatifrons* Ang., *Holometopus Tornquisti* n. sp. *Amphyx domatus* Ang., *J. obtusus* n. sp. *Cyrtometopus primigenus* Ang., *C. foecolatus* Ang., *Cyrtometopus speciosus* Dalm. *Harpina* (*Harpes*) *excavata* Linrs. *Crossoura parvula* n. gen. et n. sp., *C. lata* n. sp.

Monke (H.) Beiträge zur Geologie von Schantung I—Obercambrianbrische Trilobiten von Yentsy-yai.

Jahrb. d. Preuss. Landesanstalt und Bergakad. zu Berlin, 23, pt. 1, 1903, pp. 103-151, plates.

An abstract of this paper was published by Woodward in Geol. Mag., Dec. v, vol. 2, 1905, pp. 211 and 251, with a plate.

The author remarks: *Drepanura Ketteleri* Monke (like *D. Premesnilli* Berg.) is founded upon detached pygidia, and separate and imperfect head shields; it also has elongated cheek-spines, which remind one of the very long lateral cheek and caudal spines of *Bathynotus holopyga* Hall, from the Lower Cambrian of Vermont.

Woodward refers *Stephanocare Richthofeni* Monke to Meek's genus *Olenoides*.

The following species and genera are described by Monke: *Agnostus Koerferi* n. sp. *Liostracina Krausei* n. gen. et n. sp. *Teinistion Lansii* n. gen. et sp., *T. Sodenii* nov. *Drepanura Premesnilli* Berg., *D. Ketteleri* n. sp. *Stephanocare Gichthofeni* n. gen. et sp. *Stephanocare Sinense* Berg.

The following species, described by Walcott, Proc. Natl. Mus., vol. 29, 1905, are synonyms: *Ptychopariaceus* Walc. syn. of *Liostracina Krausei* Monke. *Dorypygella typicalis* Walc. syn. of *Teinistion Lansii* Monke. *Damesella chione* Walc., syn. of *Stephanocare Richthofeni* Monke. *Teinistion Lansii* Monke is similar to *Shantungia spinifera* Walc., but differs in the presence of an incurved frontal margin and the absence of the long frontal spine.

Moysey (Lewis). On some Arthropod remains from Nottinghamshire and Derbyshire Coal Field.

Geol. Mag., Decade V, vol. 8, 1911, pp. 497-507, text figures.

The author illustrates *Leaia trigoniodes* sp. nov.; also the glabellar region *Prestwichia* and the terminal segments of air-breathing Arthropod. It shows a thick and possibly calcareous integument. *Anthracosiro fritschii* Pocock, and other crustacea.

Narraway (J. E.) List of Trilobites found at Ottawa and immediate vicinity.

Ottawa Naturalist, vol. 26, No. 8, pp. 98-100, November, 1912.

Nason (Frank S.) The Geological relations and age of the St. Joseph and Potosi Limestone of St. Francis County, Missouri.

Am. Jour. Sci., 4th ser., vol. 12, 1901, pp. 358-361.

Nifantof (A.) Beiträge zum Studium der Fauna des Devons der Berge von Mugodjary.

Tomsk. Izv. Technol. Inst., vol. 21, 1911, p. 26, pl. 3, figs. 29-33.

Dithyrocaris sp.

Norton (Wm. H.) Variations in the position of the nodes on the axial segments of pygidium of a species of *Encrinurus*.

Proc. Iowa Acad. Sci., vol. 3, 1896, pp. 79-81.

The author remarks that in defining the different species of the genus *Encrinurus*, use has frequently been made of the disposition of the nodes on the joints of the axis of the pygidium. Foerste distinguishes *E. thresheri* from *E. ornatus* on this characteristic. The author gives the axial annulations of some 43 specimens from the Quarry at Mount Vernon, Iowa.

O'Connell (Marjorie). Summary of the distribution and occurrence of Eurypterids.

Geol. Soc. Am. Bull., vol. 24, pp. 498-515, 1913.

——— Description of some new Silurian Gastropods.

Bull. Buffalo Soc. Nat. Sci., vol. XI, 1914, pp. 93-101, plates 1-6.

Eurypterus Ruedemanni nov.

——— The habitat of the Eurypterida.

Bull. Buffalo Soc. of Nat. Hist., vol. XI, 1916.

The author gives a systematic review of the occurrence of the Eurypterida in each period from the Cambrian through the Permian.

Chapter 2. Résumé of the opinions on the habitat of the Eurypterida.

Chapter 3. The bionomy of the Eurypterid faunas.

Chapter 4. The Lithogenesis of the Eurypterid bearing beds.

Chapter 5. The geological and geographical distributions of the Eurypterids, with bibliography.

The conclusion reached by the author, after the study of all the available data, is that the Eurypterids throughout their entire phylogenetic history lived in the rivers. Schuchert in the earliest fresh water Arthropods, 1916, remarks that Eurypterids were marine animals previous to the Devonian, and that towards the close of the Silurian they became Euryhaline, or able to live in both salt and brackish water, and after Silurian time they probably became wholly restricted to the fresh water. Proc. Natl. Acad. Sci., vol. 2, 1916, p. 728.

Oehlert (D. P.) Sur les Trinucleus de l'ouest de la France.

Bull. Soc. Geol. France, 3rd ser., vol. 23, 1896, p. 299, plate.

Trinucleus Bureaui n. sp. The species is remarkable for the large tail. The author compares it with *T. ornatus*, the Bohemian form.

T. Grenieri Berg., *T. pongerardi* Roualt.

——— Fossiles Devonian Santa Lucia (Espagne). Première partie.

Bull. Soc. Geol. France, 3rd ser., vol. 23, 1896, p. 299, plates.

The author describes *Cryphaeus sublandiniatus* DeVern.

Cryphaeus (Malladaia) Luciae nov. sp. The author gives a figure in the text of this new subgenus, and compares it with *Dalmanites* and *Phacops*.

Cryphaeus Munieri Oehlert, and *Phacops Portieri* Bayle.

Cytherella cf. *subfusiformis* Sandberger.

——— *Uralichas Ribicoroi* des schistes d'Angers.

Mém. Soc. Geol. France, Palaeontologie, vol. 6, Fasc., 1896.

——— Résumé des derniers travaux sur l'organisation et le développement des Trilobites.

Bull. Soc. Geol. France, ser. 3, vol. 24, 1896, p. 97.

Triarthrus Beckii Green.

Ohern (D. W.) and Maynard (T. P.) Trilobites.

Maryland Geol. Sur. Lower Devonian, Baltimore, 1913, pp. 489-512, pl. 89-94.

The authors describe and illustrate the following species:

Proetus pachydermatus Weller, *P. cf. protuberans* Hall. *Cordania cyclurus* Hall and Clarke. *Cyphaspis Australis* n. sp. Ohern. *Calymmene camerata* Conrad. *Homalonotus Swartzii* n. sp. Ohern, *H. Vanuxemi* Hall. *Phacops Loganii* Hall. *Dalmanites aspinosa* Weller, *D. Keyserensis* n. sp. Swartz, *D. multiannulatus* n. sp. Ohern, *D. latus* n. sp. Ohern, *Dalmanites (Synphoria) stemmatus* Clarke, *D. (Corycephalus) dentatus* Barrett, *D. micurus* Green, *D. (Chasmops) anchiops* Green, *D. (Hausmannia) pleuropityx* Green, *D. berkleyensis* n. sp. Swartz.

Olin (E.) Om de Chasmopskalken och Trinucleusskiffern motsvarande bildningarne i Skane.

Lund Geologiska Fältklubb, Ser. B, No. 1, 1906, 79 pp., with 4 plates.

Acidaspis Törnquisti n. sp. *Æglina redixiva* Barr. *Agnostus cingulatus* n. sp., *A. trinodus* Salt. *Ampyx globifrons* n. sp., *A. gratus* Barr., *A. Portlocki* Barr., *A. rostratus* Sars., *A. tenellus* Barr. *Arctia succica* n. sp. *Asaphus ingens* Barr. *Calymmene dilatata* Tulb., *C. incerta* Barr., *C. pulchra* Beyr., *C. trinucleina* Linrs. *Chirurus insignis* Beyr., *C. pectinifer* Barr., *C. subulatus* Linrs. *Cybele* cf. *Grewingki* F. Schmidt. *Dindymene cornuta* n. sp., *D. pulchra* n. sp., *D. spinulosa* n. sp., *D. venusta* n. sp. *Dionide euglypta* Ang. *Holometopus cf. aciculatus* Ang. *Iliaenus Angelini* Holm., *I. longifrons* n. sp., *I. megalophthalmus* Linrs. *Li-chas laxatus* McCoy, *L. quadrispinus* Ang. *Phacops ecclesiatica* n. sp., *P. eucentra* Ang., *P. macroura* Sjogr., *P. recurva* Linrs., *P. sandhyensis* n. sp. *Phillipsia parabola* Barr. *Proetus scanicus* n. sp. *Pseudosphaerexochus laticeps* Linrs., *P. Ravini* n. sp. *Ptychopyge glabrata* Ang. *Remopleurides latus* n. sp., *R. radians* Barr., *R. sexlineatus* Ang. *Sphaerexochus* sp. *Staurocephalus clavifrons* Ang. *Stygina latifrons* Port. *Symphysurus superstes* n. sp. *Trinucleus Bucklandi* Barr., *T. ceriodes* Ang., *T. elliptifrons* n. sp., *T. latilimbus* Linrs.

Pack (Fred J.) Cambrian fossils from the Pioche Mountains, Nevada.

Jour. Geol., vol. 14, pp. 290-302, plates 1-3, 1906.

Bathyuriscus howelli Walcott, *B. productus* H. & W. *Ptychoparia piochensis* Walcott, *P. Kempi* n. sp. This species is an allied form of *P. subcoronata*, but has a peculiar boss in front of the glabella.

Zacanthoides typicalis Walc., *Z. grabaui* n. sp., differs from *Z. typicalis* in general shape of the head, the frontal margin and the genal spines.

Packard (A. S.) The Palaeontological History of Trilobites, etc., as opposed by Barrande to the evolution theory.

Amer. Naturalist, vol. 8, 1874, p. 439.

——— On the systematic position of the Trilobites.

Proc. Amer. Assoc., 1893, p. 365.

Refers the Trilobites to a separate class, and regards them as being an older, more primitive group than the Crustacea. Hence, the Trilobites probably were the first to originate from the annelid worms, while the crustacea arose by a separate line of descent.

Partridge (E. M. Miss). Echinocaris Whidbornes (Jones & Woodward) and Echinocaris stolicensis n. sp.

Geol. Mag., Dec. 4, vol. 9, 1912, pp. 307-308, plate 17.

The last species much resembles *E. sociales* (Beecher) by the carapace and is much longer in proportion to its width.

Parker (William A.) The fossil Arthropoda and Pices of Sparth, Rochdale.

Lancashire Naturalist Darwin, new ser., vol. 2, 1909, pp. 2-8.

Pygocephalus.

Parkinson (Harold). Ueber eine neue Culmfauna von Königsberg unweit Giessen und ihre Bedeutung für die Gliederung des rheinischen Culm.

Inaugural Dissertation, Marburg, 1903, 46 pp., plates.

Trilobites: pp. 336-340, Zeitschr Deutsch Geol. Ges., 1902.

Griffithides seminifer Phillips. *Phillipsia Eichwaldi* Fischer nov. var. *hassiac*, *P. gemmulifera* Phillips.

Perner (Jaroslav). Miscellanea Silurica Bohemiac.

Acad. Cisare Frankiska, Josefa, 1900.

The author describes *Cheirurus Hofmani* n. sp. pl. 1, figs 1-5.

Compares *Ch. pater* and *Ch. globosus*.

Perkins (G. H.) Geology of the Burlington Quadrangle.

7th Report Geology of Vermont, Bellows Falls, Vt., 1910, pp. 249-313, plates 53-62.

The author illustrates in the text *Triarthrus becki* Green, and in the plates without description the following species:

Harpes cassinensis Whitf. *Nileus stratus* Whitf. *Bathyrurus perkinsi* Whitf. *Bolbocephalus scelyi* Whitf. *Bathyrurus conicus* Whitf., *B. scelyi* Whitf. *Asaphus canalis* Conrad. *Isochilina cristata* Whitf., *I. gregaria* Whitf., *I. scelyi* Whitf.

Peach (B. N.) The Trilobites of the Silurian rocks of Southwest Scotland. Fauna, Flora and Geology of the Clyde area. Edited by C. F. Elliot, Malcolm, Laurie and J. Barclay Murdoch.

Brit. Assoc. Handbook, Glasgow, 1901, pp. 445-447.

List of Arthropoda of Scotland, pp. 450-455.

——— Scottish Palaeontology during the last twenty years.

Proc. Phys. Soc. Edinb., vol. 14, 1902, pp. 361-394.

The author remarks under Schizopoda, that Pseudogastrea agrees with Anthrapalaeomon and must find a place with it. Both appear to me to be ancient forms of Lophogastrid schizopods. Huxley's Pygocephalus should be classed with the same group.

——— Monograph on the higher Crustacea of the Carboniferous rocks of Scotland.

Memoirs of the Geol. Sur. of Great Britain Palaeontology, 1908, 822 pp. and 12 plates.

The author describes 34 species of fossil Schizopods.

The classification followed is chiefly based upon that adopted by G. O. Sars, arranged in two great groups, viz.:

1. The Mysid Group, including the families Lophogastridae, Perimecturidae, Anaspidae and Mysidae.

2. The Euphausiid Group has only one family, Euphausiidae.

Family Lophogastridae, Group No. 1.

Genus Tealliocaris gen. nov.

Body moderately long and slightly applanated; integuments firm and chitinous pitted or grained; carapace large, nearly one-half length of the body; seven trunk segments and externally more or less provided with longitudinal keels; rostrum spear-shaped,

PEACH (B. N.)—Continued

three-edged and denticulated; hinder part of carapace not produced into backwardly directed spines; caudal segments wide, single-lobed epimera; eyes large with papilla issuing from the pedicle; antennular peduncle long, slender, the flagella being short and of nearly equal length. First pair of legs much more massive than the succeeding ones, which are slender; branchiae given off from the base of all the seven pairs of legs with lobate sternal branches; telson large.

The author includes under this genus:

Tealliocaris loudonensis sp. nov., *T. woodwardi*, Etheridge, Jr.; described under the genus *Anthrapalaemon* in 1877; also a variety *Tealliocaris etheridgei* Peach (originally described under the genus *Anthrapalaemon* in 1882) with the var. *lata* Peach, *T. robusta* sp. nov. and var., *T. tarrasiana* sp. nov., *T. formosa* Peach (originally described as an *Anthrapalaemon* in 1882).

Genus *Pseudo-Galathea* Peach, 1883:

P. macconochiei Etheridge, Jr. (described in 1879 as an *Anthrapalaemon*), *P. rotunda* Peach, *P. ornatisissima* Peach (described in 1882 as *Anthrapalaemon ornatisimus*.)

Genus *Anthrapalaemon* Salter, 1861:

The author restricts this generic name to such applanated forms as the type *A. grossarti* Salter. *Anthrapalaemon russellianus* Salter (originally described under *Palaeocarabus* in 1863), also var. *spinulosus* and var. nov.

Family *Perimecturus* gen. nov.:

The characteristic feature of this genus is the enormous development of the tail.

The author includes under this genus: *P. parki* and var. *duplicicarinatus*, *P. stocki* sp. nov., *P. elegans* sp. nov., *P. communis* sp. nov., *P. ensifer* sp. nov., *P. pattoni* Peach (*Palaequilla pattoni* Peach 1888).

Family *Anaspidae*:

Genus *Palaeocaris* Meek & Worthen, 1868.

Palaeocaris scotica Peach, *P. landsboroughi* sp. nov.

Family *Mysidae*:

Genus *Palaemysis* gen. nov.

Trunk unknown; tails long and fusiform, and segments supplied with well-developed epimera and well-developed pleopods. External branches of the uropods much longer than the forked telson; internal branches of uropods short so that the tail fan is deeply forked.

The author included in the genus:

Palaemysis dunlopi sp. nov., *P. coultsi* sp. nov. and *P. tenuis* sp. nov.

Family *Euphausiidae*:

Genus *Anthracophausia* gen. nov.

Elongated laterally compressed, prawn-like forms, with thin, smooth chitinous integuments; carapace one-third the length of the body; peduncle on antennules long and massive, with last 2 joints extending beyond the rostrum; antenna, with basal scale and with flagellum longer than those of antennule; 7 pairs of legs, uniform; tail segments with deep epimera, all directed downwards and backwards; first 2 pairs of appendages of tail in the males very massive and specially modified for sexual purposes; telson as long as the uropods, and furnished near its ends with 2 articulated plates, one on each side.

The author describes *Anthracophausia dunsiana* sp. nov. with var. *obesa* and *A. traquairi* Peach.

Genus *Crangopsis* Salter, 1863; syn. the *Palæocrangon* and *Uronectes* Salter, 1861. *Crangopsis socialis* Salter, *C. rhodesi* sp. nov., *C. magna* sp. nov., *C. coultsi* sp. nov., *C. robusta* sp. nov., *C. eskdalensis* Peach (originally described under the genus *Palæocrangon* in 1882), *C. elegans* Peach (described in 1883 under the genus *Palæocrangon*), and *C. hastata* sp. nov., also *C. minuta* nov.

Persson (Emil). Till knneknen om Oleniderna i Zone n med Eurycece Och Leptoplastus vid Andrarum l.

Meddel. No. 11, fr. L. G. F. Geol. Fren. i Sthlm. Frhandl., Bd. 26, 1904.

Pocock (T.) The geology of the country around Macclesfield, Congle, Crewe and Middlewich.

Mem. Geol. Sur. Eng. London, 1906, p. 110.

Pompeckj (J. F.) Die Fauna des Cambrium von Tejrovie and Skrej in Bohmen.

Jahrb. d. k. k. Geol. Reich, 1895, Bd. 45, Heft 2 and 3, pp. 495-614, plates 13-17.

Agnostus section Laevigati: *Agnostus nudus* Beyr., *A. bibullatus* Barr.

Agnostus section Limbati: *Agnostus rex* Barr., *A. granulatus* Barr. *Agnostus integer* Barr., also var. *spinosa* n. var. *Paradoxides spinosus* Boeck, *P. rotundatus* Barr., *P. rugulosus* Corda, *P. imperialis* Barr., *P. orphanus* Barr., *P. expectans* Barr., *P. inflatus* Barr., *P. pusillus* Barr., *P. Jahni* n. sp. *Hydrocephalus carens* Barr., *H. saturboides* Barr. *Conocoryphe Sulzeri* Schloth., *C. (Ctenocephalus) coronata* Barr. *Ptychoparia striata* Emm., also var. *tenuis* n. var., *P. (Conocephalites) Emmrichi* Barr., *P. (Conocephalites) marginata* n. sp. *Solenopleura torifrons* n. sp., *S. ? conifrons* n. sp. *Agraulos ceticephalus* Barr., *A. spinosus* Jahn. *Ellipsocephalus Hoffi* Schloth., *E. Germari* Barr., *E. vetustus* n. sp. *Protypus ? bohemicus* n. sp. *Sao hirsuta* Barr.

—— Ein neuentdecktes Vorkomen von Tremadoc-Fossilien bei Hof. Munchen, 1896.

Bavarilla Hofensis Barr. *Dikelocephalus ? bavaricus* Barr. *Niobe inotata* Barr., *N. discrepans* Barr.

—— Ueber Calymmene Brongniart.

Neuen Jahb. Mineral. Geol. Pal. Jahrg., 1898, vol. 1.

The Calymmenidae are divided as follows:

1. Subgenus Pharostoma Corda type, *P. pulchrum* Barr.
2. Subgenus Calymmene type, *C. tuberculata* Brunn.

First Family—*Calymmene senaria* Conrad.

Second Family—*Calymmene cambrensis* Salter.

1. Synhomalonotus type, *Calymmene Tristani* Brong.
2. Synhomalonotus type, *Calymmene Arago* Roul.
3. Subgenus Ptychometopus type, *P. Polborthi* Schmidt.

—— Versteinerungen der Paradoxides Stufe von La Cabitzza in Sardiniens und Bemerkungen zur Gliederung des Sardischen Cambrium. Zeitschr. Deutsch. Geol. Ges., 1901, pp. 1-23, plate.

Paradoxides mediterraneus n. sp. *Conocoryphe Hberti* Mun-Chalm et Berg. *Ptychoparia* sp. *Olenopsis Bornemannii* Menegh. *Olenellus (Holmia) Broggeri* Walc. *Conocoryphe Levyi* Mun-Chalm et Berg.

The new name of *Paradoxides mediterraneus* is given to *P. rugulosus* Bergeron Massif. Ancien, p. 336, pl. 2, f. 5-7.

Price (W. Armstrong). Notes on the Palaeontology of Boone County. Geol. Sur. West Virginia, p. 614.

Griffithides scitulus Meek and Worthen.

Prosser (Charles) and **Kindle** (Edward M.) Geol. Sur. Maryland Middle Devonian.

Baltimore, 1913, pp. 326-335, pls. 42-44.

The authors describe the following Fossil Crustaceae:

Trilobita: *Cryphaspis Stephanophara* Hall. *Homalonotus DeKayi* Green. *Phacops rana* Gr., *P. cristata* Hall and var. *pipa* Hall.

Dalmanites (Cryphaeus) Boothi Gr.

The genus *Cryphaspis* was proposed by Dr. Green for certain Devonian Trilobites, in 1837, Am. Jour. Sci., vol. 32, 1837, p. 343, with figures of the genotype *Cryphaeus Boothi* and *C. calliteles*.

The term was pre-occupied for the Coleoptera in 1833.

Burmeister Org. Tril., 1843, under his sub-group Phacops, in which the pygidium has long spines on its circumference, classes *Asaphus archnoides* Goldf., a similar species, under Phacops. This species is now referred to *Cryphaeus punctatus* Steininger, 1831.

Milne Edwards Hist. Nat. Crust., vol. 3, 1840, pl. 34, fig. 8, copies Hoeninghaus's figure of *Calymmene archnoides*, 1833, and refers it to his new genus *Pleuracanthus*, at this time pre-occupied by Agassiz and Gray for fossil fish, 1832.

Corda Mong., Böhm Tril., 1847, p. 242, pl. 6, fig. 67, uses the term *Metacanthus* for *Phacops stellifer* Burmeister, and that of *Asteropyge*, on p. 241, with *Calymmene archnoides* Goldf. as the genotype.

All the species described under *Cryphaeus* Green should take the generic name of *Asteropyge* Corda.

In the European species of this genus the terminal spine upon the pygidium generally exceeds in length all of the five marginal spines on each side.

Provost (Pierre). Notes sur les Entomostraces bivalves du terrain Houiller du Nord de la France.

Lill. Ann. Soc. Geol., vol. 40, 1911, pp. 60-80, plate.

Phyllopora Estheria simoni n. sp. *Estheriella reumauxi* sp. nov.

Raymond (Percy E.) The Crown Point section.

Bull. Amer. Paleontology, vol. 3, No. 14, 1902, plates 18 and 19.

Gives list of Chazy fossils, including Trilobites and figures of *Thaleops ovatus* Conrad. *Bathyurus spiniger* Hall.

—— Notes on the names *Amphion*, *Harpina* and *Platymetopus*.

Amer. Jour. Sci., vol. 29, 1903, pp. 377-378.

Changes preoccupied name *Amphion* to *Pliomera* Ang. *Harpina* to *Eoharpes* n. gen. *Platymetopus* to *Amphilichas* n. gen.

—— The Trilobites of the Chazy Limestone.

Ann. Carnegie Mus., vol. 3, 1905, pp. 328-386, plates.

Harpina antiquatus Bill., *H. Ottawaensis* Bill. *Lonchodomas Halli* Bill. *Remopleurides canadensis* Bill. *Bathyurus Angelini* Bill. *Bathyurellus brevispinus* n. sp., *B. minor* n. sp. *Asaphus marginalis* Hall. *Asaphus* sp. *alpha beta* and *gamma*. *Isotellus Harrisii* n. sp., *I. obtusum* Hall, *I. angusticaudum* n. sp., *I. ? Beardi* n. sp. *Illaeus indeterminatus* Walc., *I. punctatus* n. sp., *I. Bayfieldi* Bill., *I. globosus* Bill., *I. Erastusi* n. sp. *Thaleops ovata* Conrad. *Proetus Clelandi* n. sp. *Lichas (Platymetopus)* Ang. this subgenus changed to *Amphilichas* n. subgen. by the author in another publication (*Platymetopus minganensis* Bill.). *Acidaspis* (subgen. *Glaphurus* n. subgen.). *Glaphurus pustulatus* Walc., *G. primus* n. sp. *Cybele valcourensis* n. sp.

RAYMOND (Percy E)—Continued

Amphion canadensis Bill. *Ceraurus pompilius* Bill., *C. hudsoni* n. sp. *Pseudosphaerexochus vulcanus* Bill., *P. vulcanus* var. *Billingsi* n. var., *P. approximatus* n. sp., *P. Chazyensis* n. sp., *P. (Nieszkowskia) satyrus* Bill. *Sphaerocorphe Goodnowi* n. sp. *Sphaerexochus parvus* Bill. *Dalmanites (Pterygomotopus) annulatus* n. sp.

Seven genera—Thaleops, Proetus, Glaphurus, Cybele, Sphaerocorphe, Sphaerexochus and Pterygomotopus—make their first appearance in American faunas in the Chazy formation.

Three, Bathyrellus, Glaphurus and Amphion, are not found in formations above the Chazy.

Most of the genera found in the Trenton are represented in the Chazy.

——— The fauna of the Chazy Limestone.

Amer. Jour. Sci., vol. 20, 1905, pp. 353-382.

Leperditia limatula n. sp.

The new generic name of *Heliomera* is used for *Cheirurus sol* Billings, as the type.

——— Trilobites of the Chazy Formation in Vermont.

7th Report of the State Geologist, 1909-1910, Bellows Falls, Vt., 1910, pp. 213-248, plates 32-40.

This paper was published in Ann. Carnegie Mus., vol. 3, No. 2, 1905; but this article has all been reconstructed and important additions have been made.

The subgenus *Fogdesia*, on p. 225, has been given a generic name with *Isotelus bearsi* as the type.

Nileus vigilans Meek and Worthen, as figured in Palæont. Minnesota vol. 3, part 2, p. 712, figs. 17-19, the author compares with *Nileus Perkinsi*, which differs principally in respect to the eyes, which are much larger and further back on the cephalon in *N. Perkinsi*.

The species illustrated and described are:

Eoharpes antiquatus Bill., *E. ottercaensis* Bill. *Lonchodomas halli* Bill. *Remopleurides canadensis* Bill. *Bathyurus angelini* Bill. *Bathyrellus brevispinus* Raym., *B. minor* Raym. *Basiliscus marginalis* Hall. *Fogdesia bearsi* Raym. *Onchometopus obtusus* Hall. *Isotelus harrisi* Raym., *I. platymarginatus* Raym. *Isotelus beta* Raym. *Bumastus limbatus* Raym. *Isoteloides angusticaudus* Raym. *Thaleops arctura* Hall. *Bumastus globosus* Bill., *B. erastusi* Raym. *Iliaenus punctatus* Raym. *Proetus clelandi* Raym. *Amphilichas minganensis* Bill. *Glaphurus pustulatus* Walc. *Cybele prima* Raym. *Pliomerops canadensis* Bill. *Ceraurus pompilius* Bill., *C. hudsoni* Raym. *Pseudosphaerexochus vulcanus* Bill., *P. vulcanus billingsi* Raym., *P. approximatus* Raym., *P. chazyensis* Raym. *Nieszkowskia satyrus* Bill. *Sphaerexochus parvus* Bill., *S. goodnowi* Raym. *Pterygomotopus annulatus* Raym. *Isotelus harrisi* Raym., *I. platymarginatus* Raym. *Basiliscus marginalis* Hall. *Ceratocephala narragansettensis* Raym. *Heliomera sol* Bill. *Nieszkowskia* or *Pseudosphaerexochus*.

——— On two new Trilobites from the Chazy near Ottawa.

The Ottawa Naturalist, vol. 24, Nov., 1910.

The author describes *Bathyurus superbus* n. sp., closely related to *Bathyurus extans* Hall, but larger.

Isotelus arenicola n. sp.

This species is more closely allied to *Isotelus gigas*, but this species has no genal spines like the new species.

——— Notes on Ordovician Trilobites. II. Asaphidae from the Beekmantown.

Ann. Carnegie Museum, vol. 7, No. 1, 1910, pp. 36-44, plate 14.

The author places a new genus under the family *Asaphidae* (*Isoteloides*). In this

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genus the glabella does not reach to the front of the cephalon, nor does it expand towards the front; it has also almost obsolete neck and dorsal furrows with a long and narrow form.

The author takes *Isoteloides Whitfieldi* for the type. This species is the *Asaphus canalis* Whitfield, Bull. Am. Mus., vol. 1, p. 336, pl. 34, f. 1-8, not that of Conrad or Hall.

Hall credits the name to Conrad in MSS. and figures the hypostoma and doublure from Chazy Village, New York. This is probably what is now known as *Isotelus Harrisii* Raymond.

On account of the facial suture termination at a point in the middle of the anterior margin, the author classes as Isoteliform suture the genera Asaphellus, Asaphus and Isotelus.

In Niobe the suture cuts the anterior margin in front of the eyes, and follows around the frontal margin, as in Nileus; classed as the Niobiform suture.

The genera with forked hypostoma and with Isoteliform suture are arranged:

Asaphidae—Asaphus, Onchometopus Ptychopyge, Isoteloides and Isotelus. Basilicus is the only member with Niobiform suture. This form is common with the undivided hypostoma as in Ogygia, Ptychocheilus, Asaphelina, Niobe, Symphysurus, Illaenurus, Nileus Barrande, Homalopteon and Platypeltis.

A few genera with undivided hypostoma have Isoteliform suture, namely: Megalaspis, Megalaspides and Asaphellus.

The author describes *Asaphellus gyracanthus* n. sp. (*Asaphus canalis* Cleland), *A. monticola*. Subgenus to Niobe, Hemigyraspis n. gen. This genus is proposed with *Asaphus affinis* McCoy as a type. *H. collicana* n. sp.

The author includes *Ogygia desiderata* Barr. *Niobe menapiensis* Hicks, and *N. solvensis* Hicks. *Asaphellus planus* Matt. in the genus.

Megalaspis and *Megalaspides*.

Sub-family Asaphidae:

Asaphidae, hypostoma forked.

Section 1: Asaphidae with anterior limb of facial suture marginal Basilicus.

Section 2: Asaphidae with anterior limb of suture intra-marginal, Ptychopyge, Pseudasaphus, Asaphus, Onchometopus, Isotelus, Isoteloides.

The author describes and figures *Asaphus marginalis* Hall, under the genus Basilicus, including as the young of this species *Asaphus alpha* and *A. gamma* Raymond.

The author remarks that the species is closely allied to *Basilicus tyrannus* Murch.

The pygidium figured shows two lobes somewhat similar to that of *Dicelloccephalina dicraura* Ang., as illustrated by Moberg, pp. 1-5, f. 14, Kongl. Fysiogr. Söllsk. Handl., Ang., Bd. 17, No. 7, 1906.

Onchometopus obtusus Hall. *Isotelus harrisii* Raym., *I. platymarginatus* n. sp., *I. beta* Raym. *Isoteloides angusticaudus* Raym. *Nileus perkinsi* n. sp.

Subgenus Vogdesia.

The thorax is similar to that of Nileus, as is the pygidium. The cephalon, which is short and broad, is also similar to that of Nileus, but differs from it in having smaller and much more elevated eyes, and deeper dorsal furrows.

The author refers *Nileus vigilans* (M. & W.) as figured by Clarke, Palaeont. Minnesota, vol. 3, p. 713, and *Isotelus bearsi* Raym. to this genus. *Thaleops arctura* Hall, refers *Illaeus ovatus* Raym. to this species. *Bumastus globosus* Billings, *B. erastusi* Raym., *B. limbatus* n. sp. *Amphilichas minganensis* Billings. *Ceratophala narrowayi* n. sp. *Glaphurus pustulatus* Walc., *Cybele prima* Raym.

The author figures *Pliomera fischeri* Eich. *Pliomerops canadensis* Bill., *P. pseudoraticulatus* Portk., *P. barrandei* Bill., *P. senilis* Barr. The new genus Pliomerops, with

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P. canadensis as its type, the author suggested, Am. Jour. Sci., vol. 19, 1905, p. 377, for the species of *Amphion* (*Pliomera*), in which the cephalon has a denticulate frontal border, while the other species have smooth borders.

Subgenus *Nieszkowskia* sp. ind.

Subgenus *Heliomera sol* Billings.

Sphaerocoryphe goodnowi Raym.

Symphysurus Convexus Cleland, syn. *Iliaenurus columbiana* Weller and *Bathysurus* ? *levis* Cleland.

The author gives illustrations of *S. sicardi* Berg. and *Iliaenurus quadratus* Hall.

—— Notes on Ordovician Trilobites, III. Asaphidae from the Lowville and Black river.

Ann. Carnegie Mus., vol. 7, No. 1, 1910, pp. 46-59, plates 15-16.

In this paper the species *Bathysurus longispinus*, the hypostoma of *B. extans*, the free cheek of *B. spiniger*, and cephalon of *Isoteloides homalonotoides* are figured for the first time.

The author illustrates *Basiliscus romingeri* Walc., placing as syn. *Asaphus Wisconsinensis* Walc. and *Ptychopyge ulrichi* Clarke.

Under the genus *Onchometopus*, which may be readily distinguished from *Isotelus* by the presence of a median tubercle on the glabella; the absence of a concave border on both cephalon and pygidium, the author illustrates *O. simplex* n. sp.

Under the genus *Isoteloides* the author places *Asaphus homalonotoides* Walc.

The paper also includes notes on *Isotelus gigas* Dekay, *I. maximus* Locke.

—— Notes on Ordovician Trilobites, IV. New and old species from the Chazy.

Ann. Carnegie Mus., vol. 7, pp. 60-79, plates 17-19, 1910

The material on which this paper is based is two collections, the first by the author, and the second by Dr. Perkins, State Geologist of Vermont, from Isle La Motte, which was published in advance of the State Report.

The author notes *Eoharpes antiquatus* Billings. *Remopleurides canadensis* Billings.

The author divides the family Asaphidae Emmerich into two sections. Ogyginae nov. Asaphidae with hypostoma entire and 8 segments in the thorax. Geologically the more ancient.

Section 1—Ogygina with anterior limb of facial suture marginal. Ogygia, Niobe, Asaphellus, Symphysurus, Nileus, Vogdesia, Iliaenurus.

Section 2—Ogyginae with anterior limb of suture intra-marginal.

—— Notes on parallelism among the Asaphidae.

Trans. Royal Soc. of Canada, 3rd ser., vol. 5, sec. iv, 1912, pp. 111-120, plates 1-3.

The author remarks: On the ontogeny of the Asaphidae very little is known; also that from the observation of various authors, the following may be looked upon as primitive characters in this family:

1. Strongly segmented cephalon and pygidium.
2. Absence of depressed borders.
3. Long glabella.
4. Eyes distant from the glabella.
5. Facial suture marginal in front of the glabella.
6. Pygidium and cephalon short and broad.
7. Axial lobe narrow.
8. Genal spines present.

Judged merely by these characteristics Ogygopsis, Ogygiocaris, Oygites, Asaphus,

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Niobe, Symphysurus and Basilicus, are more primitive than Isotelus, Nileus, Ptychopyge, Hemigyaspis and Asaphellus.

The author quotes Brögger's studies on the hypostoma and his division of three distinct types.

Pointed behind, Megalaspis and Ogygiocaris.

Quadrate, *Niobe insignis*.

Extended behind into two long, large prongs, Asaphus, Isotelus, etc. He remarks under the Geologic range, that the Asaphids appear earlier in America and have a longer range than in any other country.

The Cambrian, which have entire hypostomas, consists of the genera Ogygopsis, Illaenurus, Symphysurus, Asaphellus, Hemigyaspis and Megalaspis.

Ordovician, Beekmantown, the Asaphids are less varied as only Isoteloides and Nileus are present.

In the Chazy, Isotelus, Isoteloides, Basilicus, Onchometopus, Vogdesia and Nileus occur.

In the Silurian, in the Lowville (Silurian) and Back River (Ordovician), the genera Onchometopus, Isotelus, Isoteloides, Basilicus and Vogdesia.

In the Trenton there are, so far as is now known, only Isotelus and Isoteloides.

In the Utica, Isotelus and Ogygites.

In the Richmond, Isotelus, Onchometopus, Brachyaspis and probably Ogygites.

The author uses *Asaphus expansus* as the type of the genus, which is characterized by its short, broad head, and pygidium from which all depressed borders are absent; by the rather prominent glabella, which expands towards the front and reaches the anterior margin; the large eyes; the course of the anterior portion of the frontal suture, which meets in a point in front of the eye; and the short pygidium, with narrow, well-defined axial lobe and smooth pleural lobes.

The genus is well developed in the Baltic Region.

Under the heading of lines of development from the Asaphus, the author remarks that the variation in the Ordovician Baltic species seems to be in the direction of the obliteration of furrows on the surface; that is a further loss of evidence of original segmentation in cephalon and pygidium.

Onchometopus differs from Asaphus, in having the glabella less marked, the axial lobe of the thorax wider, the thoracic segments flatter, the axial lobe of the pygidium less convex and without rings.

Megalaspides, like Asaphus, with narrow axial lobe, expanding glabella, no depressed border on the pygidium, but with a narrow one on the front of the cephalon.

Isoteloides, in which both the cephalon and pygidium have depressed borders.

Isotelus, in which the axial lobe of the thorax is wide, the glabella and the axial lobe of the pygidium so ill-defined as to merge into the general surface of the head; therefore, both these smooth trilobites and species of Brachyaspis and Onchometopus are so like Isotelus, that the three genera can only be separated by their lines of development.

Basilicus is a primitive genus, with forked hypostoma, with a strongly ribbed tail; the facial suture marginal in front, and the glabella strongly outlined and shows glabella furrows.

The author remarks from Basilicus, Ogygites seems to have developed.

Tromelin and Lebesconte, Assoc. Francaise, Adv. Sci., 1875, p. 33, use the new generic name of Ogygites for Brongniart's Ogygia, it having been used for other genera in natural history. These authors use O. Desnaresti Brog. for the type, and include O. Brongniarti Rou. as a syn. The same authors refer Ogygia, the first species described under the genus by Brongniart, to the genus Asaphus.

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The author considers *Pseudoasphus* Schmidt as the next step in the development from *Basilicus* and *Ogygites*.

The author is in error in his remarks that Brongniart applied the name of *Ogygia* to *O. buchii* and *O. dilatata* with forked hypostoma. Brongniart applied the name to an *Asaphus*. The second species described by Brongniart, according to Tromelin and Lebesconte, *ibid.*, p. 34, has the entire hypostoma characteristic of *O. desiderata* Barr. Syst. Sil de Bohême, vol. 1, Suppl., pl. 4, fig. 3.

The author illustrates *Brachyaspis notans* Billings. *Ogygites canadensis* Chapman. Remarks: this species has a forked hypostoma, and should not be included under the genus.

Plate 2—*Onchometopus susae* Whitfield. *Brachyaspis alacer* Bill., *B. altilis* Raym. n. sp. *Megalaspis goniurus* Bill. *Isotelus gigas* DeKay. *Nileus perkinsi* Raym.

Plate 3—*Nileus perkinsi* Raym. *Onchometopus obtusus* Hall. *Bumastus globosus* Bill. *Nileus affinis* Bill. *Symphysurus ilaenoides* Bill. *Isotelus gigas* DeKay, and *Hemigyaspis* sp.

——— Some changes in the names of genera of Trilobites.

The Ottawa Naturalist, vol. 26, Feb., 1913.

The author remarks on the ten new genera described by Jaekel in Zeit. d. Deutsch Geol. Ges., vol. 61, pp. 380-401, 1909, should be rejected and referred to older names as follows:

Paragnostus to Condylopyge Corda, Dichagnostus to Pleuroctenium Corda, Mesagnostus to Peronopsis Corda, Miagnostus to Lejopyge Corda, Leiagnostus to Phalacroma Corda, Metagnostus to Arthrorhachis Corda. These six new genera the author rejects.

The author would reject *Microdiscus* Emmons, because it was founded on a young specimen of the genus *Trinucleus*, and substitutes *Eodiscus*. This would overlook Salter's *Microdiscus*—the generic name should read *Microdiscus* Salter (not Emmons).

Raymond, who examined the type specimen of *Pemphigaspis bullata* Hall, does not place it with *Microdiscus*, as suggested by Walcott.

The author is in favor of using Green's generic name *Cryptolithus* for Murchison's genus *Trinucleus*. This generic name has long been used by Bronn, Goldfuss, Emmerich, Angelin, Foerste and Vogdes. Eaton's genus *Nuttainia* of 1832 not used. Dr. Jacob Green claimed priority in his Monograph of Trilobites. The generic name was first described in Am. Jour. Geol., June, 1832.

The author uses *Ogygites*, Tromelin and Lebesconte, for primitive *Asaphinae*, with annulated pygidia and forked hypostomata, and *Ogygiocaris* Angelin, for *Ogygia Buchi* and *O. dilatata*.

The author favors the adoption of *Goldius* for *Brontes* and *Bronteus*. For *Acaste* Goldfuss, the author takes the generic name *Phacopidella*. Reed, 1906, as Leach in 1811, used the first genus for a genus of Cirripedes. *Arges* was used by Haan in 1835, and the author uses *Ceratarges* Gurich, for the generic name; also *Aulacopleura* Corda, in place of preoccupied generic name *Arethusina* Barrande.

——— Notes on Cyclosytoides.

Notes on some new and old Trilobites in the Victoria Memorial Museum. Description of some new *Asaphidae*. Two new species of *Tetradium*. Revision of the species which have been referred to the genus *Bathyrurus* (preliminary paper).

Bull. No. 1, Victoria Memorial Museum, October 23, 1913, 80 pp., with 7 plates.

The author remarks on *Harpes dentoni*, which he refers to the new genus *Eoharpes* from a more, or rather poorly preserved specimen, that it has from 18 to 16 segments

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in the thorax, as it is not possible to tell where the pygidium begins. He compares the species with *E. ottawaensis*. In front of the glabella the brim of *E. dentoni* is narrow, deeply concave, and the anterior rim is curved upward; while in *E. ottawaensis* the brim, at the front, is wide and nearly flat.

The author also describes and illustrates *Bumastus billingis* R. & N. *Holasaphus moorei* Matthew. *Pseudosphaerexochus apollo* Billings, to which he refers the *Amphion cayleyi* Billings and *Ceratocephala goniata* Warder.

VI. Description of some new Asaphidae.

The author includes under the genus *Hemigyraspis*, a specimen figured in Trans. Roy. Soc. Canada, vol. V, pl. 3, fig. 7, for a form similar to *Asaphellus planus* Matthew, which the author now refers to *Hemigyraspis mcconnelli* sp. nov. Including under the genus this species, also *Asaphellus planus* Matthew and *Hemigyraspis collicana* Raymond, 1910.

The author used as a type for his subgenus *Hemigyraspis*, *Asaphus affinis* McCoy, as described by Salter, Mong. Brit. Tril., pl. 24, figs. 13-14, p. 164, and included *Ogygia desiderata* Barr. *Niobe menapicensis* Hicks and *N. solvensis* Hicks with the above species.

Under *Basilicus Barrandi* Hall, the author remarks that this species has evaded the eyes of the describers of Trilobites, and it was not until recently that the writer's curiosity to know what form it was which Vogdes referred to *Ogygia* (Catalogue of Trilobites, p. 324) caused him to unearth it.

Raymond places as syn. to Hall's species *Asaphus ævisconsensis* and *romingeri* Walcott, 1879. *Ptychopyge ulrichi* Clarke, and *Basilicus romingeri* R. & N.

Under the Genus *Ogygites* Tromelin and Lebesconte, 1875.

The author describes and illustrates *Ogygites canadensis* Chapman, referring as syn. *Asaphus halli* and *hinksii*, and comparing *Asaphus latimarginatus* Hall, with the species.

The author describes as new *Isotelus latus*, differing from *I. gigas* in having all its parts much wider.

Raymond remarks, that the Museum contains a number of specimens of *Isotelus* from St. Joseph Island, from which Stokes in 1823 figured a specimen as *Asaphus platycephalus*, which compares well with DeKay's *I. gigas* of 1824, and advocates the dropping of DeKay's species.

The following authors use *platycephalus* Stokes, in preference to DeKay's name of *I. gigas*: Bronn in 1835, Buckland in 1840, Burmeister in 1843, Roemer in 1851-56, Nieszkowski in 1857, Billings in 1863, and Vogdes in 1893. I think due credit should be given to Stokes and eliminate *gigas*.

The author also describes and illustrates *Isotelus maximus* Locke, and *Brachyaspis ctilis* Raymond, the *Asaphus platycephalus* Billings. (Catalogue of Silurian Fossils of Anticosti, p. 26, fig. 9b.)

VIII. A revision of the species which have been referred to the genus *Bathyurus*.

The author states that Billings erected the genus *Bathyurus* with *Asaphus extans* Hall, for the type, and described many species under it. Some 50 species have been referred to this genus; but in the revision the author only includes twelve, including three new species.

Under the Family Bathyuridae Walcott, the author gives a revised generic description and describes the following species:

Bathyurus extans Hall, *B. perplexus* Billings, probably a synonym of *B. extans*, *Bathyurus johnstoni* sp. nov. closely allied to *B. extans*. *Bathyurus* sp. intermediate between *B. extans* and *B. superbus*. *Bathyurus superbus* Raymond. This species attains a larger size than any other known *Bathyurus*. *B. longispinus* Walcott, *B. amplimar-*

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ginatus Billings (syn. *B. manganensis* Bill.), *B. glandicephalus* Whitf., *B. angelini* Billings, *B. acutus* sp. nov., *B. arcuatus* Bill., *B. spiniger* Hall, *B. ingalli* sp. nov., and *B. schucherti* Clarke.

With *Bathyurus micro* Bill., for a type the author proposes the new genus *Petigurus*.

The genus is closely allied to *Bathyurus*, but differs as follows:

The facial suture reaches the posterior margin near the genal angle, the anterior end of the glabella overhangs the concave border; glabellar furrows are entirely absent, and the eyes are somewhat farther forward. The pygidium is without concave border, the ribs of the pleural lobes are reduced to nodes, and the axial lobe is ringed for almost its entire length.

Petigurus Nero (Billings) an Irish species described by Reed, 1910, as *Bathyurus aff. micro*, differs in the posterior end of the facial suture, turns sharply outward behind the eye, forming a broad, fixed cheek, different from *Petigurus nero*, and from any species of *Bathyurus*.

The author also refers to the genus *Petigurus cybele* (Billings).

Family Solenopleuridae Angelin:

The author gives the following diagnosis of his new genus *Hystricurus*: Type *Bathyurus conicus* Billings.

Glabella conical, tapering towards the front, outlined by deep furrows at sides and front; glabella furrows absent; fixed cheeks long, extending nearly to the genal angle; dorsal furrows paralleled by a narrow, convex ridge; eyes of medium size, situated opposite the middle of the glabella; cranidium with deeply concave border in front; pygidium rounded, with concave border, axial lobe prominent, with 5 rings, and there are 5 pair of ribs on the pleural lobe; surface smooth or pustulose.

In addition to the type which the author illustrates, he includes under the genus *Hystricurus crotalifrons* (Dwight, 1884) and *H. cordai* (Billings), *B. seelyi* Whitf. Bull. Am. Mus., vol. 2, p. 62, pl. 13, figs. 8-14, as a synonym, and not *B. seelyi*, vol. 1, 1886, referred to *Bolbocephalus*.

Family Proetidae Barrande:

Genus *Haploconus* nov. This genus is proposed to include Trilobites related to *Cyphaspis*, but differing in not having isolated basal lobes on the glabella, and in having a less prominent axial lobe on the pygidium. Type *Bathyurus smithi* Billings.

The author describes *H. smithi*, and includes in the genus *Cyphaspis* ? *galenensis* Clarke, and probably *C. ? brevimarginata* Walcott.

Family Dikelocephalidae, Miller, 1889:

Miller includes in the family *Dicellocephalus*, *Pterocephala* and *Ptychaspis*.

The author proposes the new genus *Platycolpus*, for *Bathyurus capax* Billings, a Trilobite with hemispheric, rather smooth cephalon, a depressed glabella extending to the anterior border, which is a flat, striated rim; glabella furrows faint or absent; eyes small, situated midway on the length of the head; facial sutures cutting the posterior margin just inside the genal angles, and the anterior margin in front of the eye.

Pygidium semi-circular, without depressed border and with faint traces of segmentation.

The author describes *Platycolpus capax* (Billings), *P. catoni* Whitf., which has faint glabella furrows, also *P. dubius* with a more pointed glabella, and *P. barabuenensis* Whitf. with a more convex glabella.

Family Agraaulidae Dalman:

Under the new genus *Plethopeltis* with *Agraulos saratogensis* Walcott, for the type the author gives the following diagnosis:

Cephalon strongly convex, wider than long, without concave border or marginal rim; glabella faintly defined, without glabella furrows; eyes small, situated well for-

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ward; free cheeks, rather wide, smooth, with short spines at the genal angles; pygidium small, with few traces of segmentation; convex; no border.

The author also includes *Plethopeltis armatus* (Billings) described under *Bathyurus* by Billings in 1860.

Family uncertain.

Goniurus nov. Type *Bathyurus perspicator* Billings, 1865.

Type diagnosis for this genus includes Trilobites, in which the facial suture, as in *Bathyurus*, except that the fixed cheek extends a little farther towards the genal angle; eyes very long, narrow and close to the glabella; glabella long, reaching almost to the frontal margin, tapering rapidly in front of the eyes; neck furrow sharp, extending across fixed and free cheeks; genal angles with short, sharp spines; a narrow, elevated rim extends around the whole cephalon, and the cephalon is slightly nasute in front; pygidium convex, triangular, with a long terminal spine.

Goniurus perspicator (Billings), *G. caudatus* (Billings), *G. elongatus* n. sp.

Matthew, Trans. Roy. Soc. Canada, vol., 1895, p. 269, referred to *Bathyurus candatus* Billings, as a possible species of this genus *Holasaphus*; but the pygidium has no furrow within the border.

Genus *Lloydia* Vogdes, 1890.

This genus was proposed by Vogdes in Ball. U. S. Geol. Sur., No. 63, p. 97, for *Bathyurus bituberculatus* Billings, in honor of the first author on Trilobites.

Edward Lloyd published in Philosophical Trans., vol. 20, No. 243, p. 279, 1698, the first description of Trilobites.

Dr. Billings, in the Canadian Naturalist and Geologist, vol. 5, 1860, p. 317, provisionally refers to his genus *Bathyurus*, two species of fossils from Point Levi as *Bathyurus dubius* and *B. bituberculatus* figs. 21 and 22. The second species, which is represented by a rough woodcut, presents a glabella, somewhat tumid and extending to the front margin, with basal lobes elongated, oval and pointed at both ends, separated from the glabella by shallow, obscure grooves; eyes opposite the mid-length of the glabella.

Raymond places the first species of *Bathyurus* in the family Dikelocephalidae, under a new genus *Platycolpus hubius*, and gives the following diagnosis of *Lloydia* Vogdes.

Whole animal oblong in outline; cephalon and pygidium regularly rounded, with elevated convex borders; cephalon convex; glabella usually tapering towards the front and reaching to the marginal border; glabella outlined by shallow or deep dorsal furrows; eyes small, near the dorsal furrows, and situated halfway to the front; facial sutures cut the posterior margin at the genal angles and the anterior margin in front of the eyes; genal angles usually without spines; thorax of 9 segments, pleura deeply grooved, ending in long, acute spines; pygidium with narrow axial lobe, which may have from 1 to 8 joints; pleural lobes smooth. The convex border which encircles the pygidium is set off by a shallow furrow.

Type *Bathyurus bituberculatus* Billings, which is common in the conglomerates at Point Levis near St. Joseph's Church, Beekmantown age.

The author also includes under *Lloydia*, *Bathyurus Saffordi*, which differs from the type, in lacking the basal lobes on the glabella; also *Bathyurus solitarius*, from Hare Bay, Newfoundland. *Lloydia oblongus* (Billings), similar to *L. saffordi*, but has straight sides to the glabella instead of tapering forward.

The author includes with doubt *Lloydia strenuus* Billings.

The illustration given by Billings, Pal. Fossils of Canada, p. 204, fig. 188, compares well with the type of *Bathyurus*.

Dr. Raymond places two species described by Billings as *Bathyurus quadratus* and *breviceps*, under a new genus *Leiostegium*, with the following diagnosis: General

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form elongate, oval; cephalon and pygidium, nearly equal, both rounded, smooth and convex; glabella quadrate, outlined by deep, narrow dorsal furrows and extending to the very narrow elevated anterior rim; fixed cheeks wide, eyes small and far from the glabella; thorax of 9 segments; pygidium almost semi-circular, unsegmented; axial lobe elevated, extending nearly the whole length. No concave border. Type *Bathyrurus quadratus* Billings.

—— Notes on the ontogeny of *Isotelus gigas* DeKay.

Bull. Mus. Comp. Zoology Harvard College, vol. 58, No. 5, 1914, p. 247-263, with 3 plates.

The author gives the ontogeny of three Asaphids, namely, *Isotelus gigas*, *I. maximus* and *Basilicus barrandei*. Raymond remarks on:

I. Basilicus stage. The glabella is convex, narrowed behind, with a median tubercle and basal lobes. The brim is wide and horizontal; the cephalon semi-circular in outline; the genal angles produced into long spines; the axial lobe of the thorax is narrow; the pygidium has a prominent axial lobe, and the pleural lobes of the pygidium are ribbed.

II. Ogygites stage. The glabella soon becomes flattened and the facial sutures intermarginal, as in the adult of Ogygites.

III. *Isotelus* stage. The head and tail both become smooth and the axial lobe widens, as in the adult of *Isotelus*.

IV. *Isotelus gigas* stage. The head and tail becomes triangular and the spines are lost from the genal angles, a combination of characters distinguishing this species.

The author remarks in regard to *Isotelus ioewensis* Owen, that it is so closely allied to *I. gigas*, that where the two species occur together, as at Trenton Falls, it seems almost like hair-splitting to recognize two species. The adult *Isotelus ioewensis*, has long genal spines extending to the 5th, 6th and 7th segments of the thorax.

Isotelus maximus Locke.

The author remarks that the common asaphids at Cincinnati are *Isotelus gigas*, *I. maximus*, *I. latus*, an undescribed species and one of the genus *Onchometopus*.

The four more common species of *Isotelus* in the Middle and Upper Ordovician are classed as follows:

A. Shield about three-fourths as long as wide.

a. Adult without genal spines, shield subtriangular, *I. gigas*.

b. Adult with genal spines, shield rounded, *I. ioewensis*.

B. Shields less than three-fourths as long as wide, regularly rounded.

a. Adult without genal spines, *I. latus*.

b. Adult with genal spines, *I. maximus*.

The author places *Proetus spurlocki* Meek as a young *Isotelus*, probably that of *I. maximus*.

The article closes with a description of *Basilicus Barrandei* Hall, the author referring *Asaphus romingeri* Wale. and *A. wisconsensis* Wale. to the species, including *Ptychopyge ulrichi* Clarke, under the same.

—— Notes on the ontogeny of *Paradoxides*, with description of a new species.

Bull. Mus. Comp. Zoology Harvard College, vol. 58, No. 4, 1914, pp. 225-244, plates.

The author describes and illustrates *Paradoxides Harlani* Green, and a new species, under the name of *Paradoxides Haywardi*, with a Bibliography of the genus.

The author classes the genus after Ford into two groups:

A. With the second segment of the thorax prolonged beyond the others. To this group belong the Bohemian and South European species.

RAYMOND (Percy E)—Continued

B. A group of species, in which the second segment of the thorax is in no way distinguishable from the others. To this group belong the Scandinavian, British and American forms.

The author remarks that *Paradoxides Harlani*, differs from other species and one which makes it almost unique, in the wide, depressed brim at the anterior end of the cranidium.

——— New and old Silurian Trilobites from S. E. Wisconsin, with notes on the genera of Illaenidae.

Bull. Mus. Comp. Zool., vol. 60, 1916, No. 1.

The author divides the Illaenoidae into two sections:

I. Illaenoidae.

Genera Illaenus, Thaleops, Dysplanus, Wossekia gen. nov. and Octillaenus, Bumastinae, Genera Bumastus, Actinolobus, Illaenoides.

Under Bumastus the author includes descriptions of the following species:

Bumastus cuniculus Hall, *B. Niagarensis* Whitf., *B. Dayi* nov., *B. decipiens* nov., *B. tenuis* nov., *B. insignis* Hall, *B. ioxus*, *B. graftonensis*.

M. & W. & *B. indeterminatus* Wale.

Under Eichwald's genus Actinolobus, he refers a single pygidium as *Actinolobus Americanus* from Racine Dolomite.

II. Lichadidae—The author refers Weller's *Dicranopeltis nasuta* to *Trochurus nasuta*.

Odontopleuridae—*Ceratocephala goniata* Warder, 1838.

Encrinuridae—*Encrinurus reflexus* nov.

The author refers to a new species a pygidium of large size, with 8 pairs of ribs on the lateral lobes, which he compares with other American species.

Calymmenidae—The author enumerates the following species:

Calymmene Niagarensis Hall, *C. breviceps* nov. for Hall's *C. Niagarensis*, 28th Rep. N. Y. State Cab. Nat. Hist., pl. 32, fig. 7-15.

Calymmene celebra nov. for Hall's *C. Niagarensis*, 20th Rep. N. Y. State Cab. Nat. Hist., p. 334, based on the pygidium which has 4 pairs of narrow ribs without impressed line, that reach only one-half way to the margin. New genus Liocalymene, with Vauxem's species *Hemicrypturus Clintoni* for its genotype. This form has a smooth pygidium without ribs and a jointed axis, from the Clinton of New York.

This genus should include the French and Spanish Silurian form described as *Calymmene Aragoi* by Rouault, which differs from *C. Salteri* described by the same author in having 10-11 joints on the axis, and *C. Arago* only 7.

Cheirurus Niagarensis Hall. The author restricts this species to Hall's species from Rochester, Pal. N. Y., vol. 2, p. 303, pl. 67, figs. 9-10.

Raymond refers the *Ceraurus insignis* Hall, Pal. N. Y., vol. 2, 1852, p. 300, pl. 6a, fig. 4, to *Cheirurus Welleri* nov. Also included Roemer's *C. bimacronata* Sil. Fauna, Tenn., p. 80, pl. 5, fig. 19, and Hall's *C. Niagarensis*. 20 Rep. N. Y. State Cab. Nat. Hist., pl. 21, figs. 10-11, and others.

Cheirurus dilatatus nov. for Hall's *Sphaerexochus Romingeri*? 28 Rep. N. Y. State Mus. Nat. Hist., 1877, pl. 32, fig. 16.

Cheirurus patens nov., *C. Tarquinius* Bill., *C. Hydei* Weller, and *C. nuperus* Bill.

The type of this species was lost and no further specimens have been described.

Sphaerexochus Romingeri Hall. The author remarks that the pygidium of this species is rare and usually incorrectly figured. The pygidium is entire, and the spine-figured by Hall are the ribs on the pleural lobes.

——— Beecher's classification of Trilobites after twenty years.

Am. Jour. Sci., ser. 4, vol. 43, 1917, p. 196-210.

RAYMOND (Percy E)—Continued

The author remarks on the order Hypoparia in Beecher's classification. Since the young of practically all primitive Trilobites lack eyes on the dorsal side, Beecher grouped all Trilobites in which absence of eyes was a primary characteristic in his First Order, Hypoparia. Recent studies and discoveries have led a number of investigators to the conclusion that blindness in the Agnostidae, Eodiscidae, Trinucleidae, Raphiophoridae and Harpedidae is secondary and a degenerative not primitive characteristic. If their position is well taken, then the order should disappear and the families be distributed in the two orders which remain.

The author gives a figure of *Agnostus nudus* exhibiting the facial suture and free cheeks. The facial sutures are not marginal, but intra-marginal. They meet in an obtuse angle at the front and run backward just inside the margin, somewhat like the course of the pre-ocular portion of the suture in an Homalonotus. The sutures keep within the angles, so that the fixed cheeks bear the genal angles—a Proparian characteristic. The sutures in this manner cut off a yoke-shaped area, bounded outside by the facial sutures and inside by a marginal edge, which follows the outline of the base of the elevated portion of the cranidium (the glabella). Both limbs of the yoke taper backward to a point, and it forms a continuous plate, with no vertical or epistomal sutures. This plate has the position and aspect of a large epistomal plate, but, whether called an epistoma or free cheek, the sutures which separate it from the cranidium must be interpreted as the facial sutures.

The author includes only one family under Hypoparia, that of Eodiscidae, Eodiscus as defined by Matthew, 1896, Mollisonia Walc. and Pagetia Walc. The discovery of *Pageria vootes* and *P. clytia*, which bear eyes very close to the lateral margins, seems to be a confirmation of the previous supposition that the Eodiscidae have ventral free cheeks.

Dr. Raymond does not note *Microdiscus caudatus* Delgado, a species with a mucronated pygidium and with free cheeks, from the Cambrian of Portugal.

Delgado's description, p. 349, pl. 3, fig. 12, Fauna Cambrian Haut Alemtejo.

Remarks: "La suture faciale, mais il semble que á partir de l'angle antérieur de l'oeil; il décrit une courbe très courbe, ayant la convexité tournée en dehors, allant traverser le contour extérieur de la tête près de la projection de l'oeil; postérieurement il décrit aussi une courbe analogue, atteignant le contour intérieur en dedans de la projection postérieure du centre de figure de l'oeil."

I would suggest the new genus Delgadoia for this species as a type.

Dr. Raymond remarks on Shumardidae, that these little trilobites are too much of a puzzle to be discussed at any length.

The paper ends in a discussion of Harpedidae and Trinucleidae.

The author would not include Oronetopus in the last family, and remarks: "It is so unlike any of the Trinucleidae, that the burden of proof that it belongs to that family should be upon those who placed it there."

Under Raphiophoridae, a figure of *Louchodomas portlocki* Barr., which shows on the ventral side of the head, a yoke-like plate similar to that of *Agnostus nudus*, but instead of being confined to the ventral side it laps over the margins up onto the dorsal side, being separated from the cranidium by a suture which has the course of the ordinary facial suture. The absence of eyes makes the analogy with the ventral plate of *Agnostus* the more complete.

Having reviewed all the families of the Hypoparia the author remarks that there seems to be a tendency in two directions—in *Agnostus* and Eodiscidae towards the Proparia, and in the Trinucleidae and Raphiophoridae towards the Opisthoparia.

Mesonacidae:

The author remarks there can be no doubt that *Elliptocephala asaphoides* and other

RAYMOND (Percy E)—Continued

species of this family show distinct traces of facial sutures, particularly of the part behind the eyes. He gives a figure of the head of a young species of *Elliptoccephala asaphoides* Emmons.

In regard to the placing of Calymmenidae, Dr. Raymond follows that of Beecher and places it in the Order Proparia, because the post ocular portion of the facial sutures cut the genal angles in *Pharostoma* and the genal spines are borne by the fixed cheeks. The free cheeks are decidedly Proparian.

— and Barton (Donald C.) A revision of American species of *Ceraurus*.

Bull. Mus. Comp. Zoology, vol. LIV, No. 20, 1913.

The authors state that the genus *Ceraurus* was proposed in 1832 by Green, for a new Trilobite which he describes as *Ceraurus pleurexanthemus*, and refer to Green's Monograph, 1832, p. 83.

The original description of this genus was first published in The Monthly Journal of Geology, June, 1832, p. 560, fig. 10, republished in the monograph.

Although the authors do not quote Corda, they take Reed's classification of *Cheirurus* into two groups on the form of the pygidia. The first with cyrtometopian pygidium like *Ceraurus* Green. The second like *Cheirurus insignis* type of pygidium with 3 pairs of subequal pleural spines and a short median spine.

The American species they class as follows:

Ceraurus hispidus sp. nov.

Glabella or occipital segment strongly spinose with a pair of short, horn-like spines on the crest of the frontal lobe.

Ceraurus numitor Billings. A single medium spine on the neck segment.

Ceraurus mismeri Foerste. Glabella expanding rapidly forward. Genal angles with spines.

Ceraurus hudsoni Raymond. Glabella expanding forward; eyes more than one-half the length of the head; a small form glabella expansion 1 in 4.

Ceraurus pleurexanthemus Green. A medium-sized glabella expansion 1 in 7.

2. *Ceraurus milleranus* M. & G. Eyes one-half the length of the head from the posterior margin.

3. *Ceraurus dentatus* n. sp. Eyes less than one-half the length of the head from the posterior margin.

Ceraurus granulosus sp. nov. Glabella with parallel sides.

The authors note in the Trenton fossils of *Ceraurus pleurexanthemus* Green, from the typical locality, that the pygidium varies on the posterior border with either spinose and rounded border or with 2, 4 or 5 short spines or denticles.

The *Ceraurus dentatus* sp. nov.

The authors refer to Hall's *C. pleurexanthemus*, Pal. N. Y., vol. 1, p. 1847, pl. 65, figs. 1d, 1h, 1i, and pl. 66, figs. 1a-1g.

The *Ceraurus granulosus* sp. nov. is the *C. pomphilius* Raymond, 7th Report, Geol. Vermont.

The *Ceraurus* *Milleranus* M. & G. is the *Calymene bucklandi*, Anthony, 1839. (I would suggest the older name.)

The authors refer *Ceraurus rarus* Walcott to *Eucrinurus* *Ceraurus pustulosa* Hall to *Eoharpes*.

To conform with the authors' reclassification, the authors remark that besides the species noted, that Vogdes' Catalogue, made in the year 1893, contains a number of other species, which do not belong to the genus as now restricted, as follows:

Cheirurus apollo Billings, to the genus *Anacheirurus*. *Cheirurus glaucus*, *C. satyrus* and *C. perforator* Billings, belong to *Nieszkowskia* (Schmidt subgenus of 1881).

RAYMOND (Percy E.) and BARTON (Donald C.)—Continued

Cheirurus vulcanus, *C. prolificus* and *G. mercurius* Billings.

The authors refer with doubt to *Pseudosphaerexochus*.

They refer *Ceraurus niagarensis* Hall, *Ch. tarquinius* Bill., *Ch. nuperus* Bill. and *C. hydei* Weller, to *Cheirurus*, though the last two show a curious parallel development in that they have a *Ceraurus*-like pygidium. (Then why divide the genus?)

Cheirurus sol the type of Raymond's genus *Heliomera*.

The author classes *Ch. polydrus* Bill. and *Ch. pompilus* Billings, under *Ceraurus* Barton, a new genus.

——— and Narraway (J. E.) A new American *Cybele*.

Annals of the Carnegie Mus., vol. 3, No. 4, 1906, pp. 597-602, fig.

Cybele Ella. n. sp.

The glabella described as *Glaphurus primus* Ann. Carnegie Mus., vol. 3, p. 362, belong to the genus *Cybele*. The Chazy form should be known as *Cybele prima*, and the name *Cybele valcourensensis* should be eliminated.

Ravn (J. P. J.) Trilobitfaunaen i den bornholmske Trinucleusskifer
Avec résumé en français.

Danmark's Geologiske Undersogelse, 11 R., No. 10, 1899, pp. 49-62.

Primitia strangulata Salt. *Agnostus trinodes* Salt. *Trinucleus Wahlenbergi* Rouault, *T. Bucklandi* Barr. ? *Amphyx Portlocki* Barr., *A. gratus* Barr. *Dionide euglypta* Ang. *Remopleurides radians* Barr. *Calymene* sp. *Asaphus (Ptychopyge) nobilis* Barr. *Illeenus leptopleura* Linrs. *Illeenus Angelini* Helm. *Illeenus* sp., l. (*Panderia*) *megalophthalmus* Linrs. *Phacops recurvus* Linrs. *Cheirurus insignis* Beyr. ? *Pseudopharexochus laticeps* Linrs. *Cybele* sp. *Dindymene ornata* Linrs. *Acidaspis (Cyrtometopus?) decacantha* Ang. - *Phillipsia parabola* Barr.

Redlich (K.) The Cambrian Fauna of the Eastern Salt range.

Memoir Geol. Survey India, new series, vol. 1, No. 1, 1899, pp. 1-13, plate.

Hoeferia noctlingi n. gen. et sp. (non *Hoeferia* Bitner Moll. 1895.)

Dr. Redlich compares this form with the genera *Protolenus*, *Paradoxides* and *Metatoxides*.

The genus is now referred to *Redlichia*, Crossman, see Rev. Critique Pal., 1902, sixieme Ann., p. 52.

Reed (F. R. Cowper). Woodwardian Museum Notes. On *Phacops* (*Chasmops*) *Marri*.

Geol. Mag. London, Decade iv, vol. 1, 1894, p. 241.

——— Woodwardian Museum Notes. New Trilobites from the Bala beds of the County Waterford.

Geol. Mag. London, Decade iv, vol. 8, 1895.

Cybele Tramorensis n. sp.

Trinucleus hibernicus nov.

——— The fauna of the Keisley Limestone.

Quart. Jour. Geol. Soc. London, vol. 52, 1896, pp. 407-437, plates.

Agnostus cf. *galba* Bill. *Amphyx binodulosus* n. sp. *Tiresias insculptus* McCoy.

Remopleurides Colbii Portl., *R. longicostatus* Portl. *Cyphoniscus socialis* Salt. *Calymene Blumenbachii* var. *Caractaci* Salt.

Illeenus Bowmani Salt., also var. *brevicapitatus* and *longicapitatus*. *Illeenus fallax* Holm., *I. Roemeri* Volb., *I. caccus* Holm., *I. galeatus* n. sp.

REED (F. R. Cowper)—Continued

Cheirurus bimucronata Murch. var. a *C. cancrurus* Salt., *C. Keisleyensis* n. sp., *C. cf. glaber* Ang., *C. cf. clavifrons* Dalm. ? *C. (Pseudosphaerexochus) conformis* Ang., *C. (P.) subquadratus* n. sp.

Sphaerocoryphe granulata Ang. *Sphaerexochus mirus* Beyr., *S. latirugatus* n. sp. *Straurocephalus Murchisoni* Barr.

Acidaspis convexa n. sp. *Lichas laxatus* McCoy, *L. affinis* Ang., *L. conformis* Ang. var. *Keisleyensis*, *L. Hibernicus* Portl., *L. bifurcata* n. sp., *L. buliceps* Phil. MS.

Cyphaspis ? *Harkessi* n. sp., *C. (Tornquistia)* n. subgen. *Nicholsoni* n. sp.

Phillipsinella parabola Barr. *Harpes Wegelini* Ang., *H. costatus* Ang.
Harpes species a-b.

—— Woodwardian Museum Notes. On the evolution of the genus *Cheirurus*.

Geol. Mag. London, Decade iv, vol. 3, 1896, pp. 117-123 and pp. 161-167.

The author arranges the genus *Cheirurus* as follows:

1. *Cheirurus* (*Anacheirurus*) type, *C. Frederici* Salt. Cambrian.

The Tremadoc species has 11-12 thoracic segments, each of which is deeply grooved along its middle. Pygidium has 4 rings and 3 short pleural lobes on each side, which are grooved throughout and extend over the margin into spines.

2. *Cheirurus* (*Eccoptocheile*) type, *C. claviger* Beyrich. Ordovician.

Glabella oval, often much inflated. Thorax 10 segments, grooved imperfectly.

3. *Cheirurus* (*Cyrtometopus*) type, *clavifrons* Dalm. Ordovician-Silurian.

4. *Cheirurus* (*Hemisphaerocoryphe*) type, *pseudo-hemicranium*, Nieszk. Ordovician.

The basal lobes of the glabella are separated by a strong glabella, side furrow joining the neck furrow. These lobes are less elevated than the rest of the glabella.

5. *Cheirurus* (*Sphaerocoryphe*) type, *S. cranium* Kutorga. Ordovician.

6. *Cheirurus* (*Nieszkowskia*) type, *cephaloceros*, Nieszk. Cambrian and Ordovician.

7. *Cheirurus* (*Pseudosphaerexochus*) type *hemicranium* Kutorga. Ordovician.

The characteristics of the above two genera are 12 thoracic segments and the presence of a longitudinal row of puncta instead of a furrow on the inner portion of each pleura.

8. *Cheirurus* (Group 1 with cyrtometopian pygidium) type, *C. Exsul* Beyr. Ordovician-Silurian.

In this group the anterior pleura of the tail are enlarged and project behind the posterior ones.

Barton refers this group to *Ceraurus*.

9. *Cheirurus* Group 2 type *C. bimucronatus* Murch. Ordovician-Silurian.

In this group the pygidium has 3 pair of pleura with free ends. The fourth pair are represented by a single medium terminal piece.

Barton refers this group to *Cheirurus*.

10. *Cheirurus* (*Crotalocephalus* type, *C. articulata* Münster. Devonian.

This genus is almost entirely restricted to the Devonian. The important subgeneric characteristics are the continuous first and second side furrows of the glabella, the triangular basal lobes, which nearly or quite meet in the centre of the glabella at their apices, and the nearly straight obliquely directed third side furrows.

—— *Trinuclerus sciticornis*.

Geol. Mag. London, Decade iv, vol. 4, 1897, pp. 427-428.

REED (F. R. Cowper)—Continued

——— Fossils from the Grey shales marked on the map as Trilobite shales.

Quart. Jour. Geol. Soc. London, vol. 53, 1897, p. 538.

Trinucleus seticornis His. var. *portrainensis* n. var.

——— Notes on the Geology of the County Waterford.

The fauna of the Ordovician beds near Tramore.

Geol. Mag. London, Decade iv, vol. 4, 1897, pp. 502-512. List of fossils.

——— Notes on the affinities of the genera of Cheirurus.

Geol. Mag. London, Decade iv, vol. 5, 1898, pp. 206-214.

——— Blind Trilobites.

Geol. Mag. London, Dec. iv, vol. 5, 1898, pp. 439-447, and 493-506.

The author divides the Blind Trilobites into two divisions as follows:

Group 1—Primitive forms.

Agnostus Cambrian—Ordovician.

Microdiscus Cambrian.

Trinucleus Ordovician.

Ampyx Ordovician-Silurian.

Dionide Ordovician.

?*Salteria* Ordovician.

Endymionia Ordovician.

Tiresias Ordovician.

Conocoryphe s. str. Cambrian.

Ctenocephalus Cambrian.

Erinnys Cambrian.

Carausia Cambrian.

Dictyocephalites Cambrian.

Eryx Cambrian.

Aneucanthus Cambrian.

Anopocare Cambrian.

?*Avalonia* Cambrian.

?*Bathynotus* Cambrian.

Carmon Ordovician.

Holocephalina Cambrian.

?*Telephus* Ordovician.

Dindymene Ordovician.

Areia Ordovician.

Placoparia Ordovician.

Prosopicus.

Isocolus Ordovician.

Typhloniscus, Lower Devonian.

?*Cyphoniscus* Ordovician.

Conophrys probably—Ordovician.

Shumardia larval forms—Ordovician.

The genera Dindymene Typhloniscus and Carmon the author places with some hesitation in Group 1, which may be regarded as reversionary or degenerate types on account of their primitive adult cephalic features, combined with morphological characters.

The genera *Salteria*, *Avalonia*, *Bathynotus*, *Telephus* and *Cyphoniscus* may be ultimately found to possess eyes.

Group 2—Adaptive forms.

Harpes benignensis Barr., Etage Dd. 1.

Iliaenus Angelini Holm.

—*aratus* Barr., Etage Dd. 1.

—*caecus* Holm., Keisley Limestone.

—*galcatus* Reed, Keisley Limestone.

—*Katzeri* Barr., Etage Dd. 1.

—*leptopleura* Linnars., Trinucleus Beds.

—*Zeidleri* Barr., Etage Dd. 5.

Proetus dormitans Richter, Tentaculites Beds.

Proetus expansus, Tentaculites Beds.

Acidaspis myops Richter, Tentaculites Beds.

Phacops (*Trimerocephalus*) *larvis*, Münst. Upper Devonian.

REED (F. R. Cowper)—Continued

——— Woodwardian Museum Notes. A new Carboniferous Trilobite. Geol. Mag. London, Decade iv, vol. 6, 1899, pp. 241-245, plate.
Phillipsia cracoensis n. sp.

——— Woodwardian Museum Notes. A new Trilobite from Mount Stephen Field, B. C.
Geol. Mag. London, Decade iv, vol. 6, 1899, pp. 358-361, figure.
Oryctocephalus Reynoldsi n. sp.

——— The Lower Palaeozoic bedded rocks of County Waterford. Quart. Jour. Geol. Soc., London, vol. 55, 1899, pp. 718-772, pl. 49.
Asaphus Haughtoni n. sp. *Cybele Macheneryi* n. sp., *C. sex-tuberculata* n. sp. *Encrinurus fallax* n. sp. *Ilacnus Davisi* var. *pseudolimbatus* n., sp. *Remopleurides Portlocki* n. sp., *R. Salteri* n. sp., *R. tuberculatus* n. sp. *Tramoria punctata* n. sp.
The author abandons this genus and refers the species to *Apatokepalus punctatus*, Geol. Mag., Dec. 4, vol. 7, p. 46, 1900.

——— Woodwardian Museum Notes. On the British species of the genus *Conocoryphe*.
Geol. Mag. London, Decade iv, vol. 7, 1900, pp. 250-257.

The genus *Conocoryphe* sens. str., is confined in Britain to the Lower and Middle Cambrian beds.

The author reclassifies the species as follows:

Euloma abdita Salt. *Solenopleura applanata* Salt. *Olenus* ?-*bucaphalus* Belt. *Conocoryphe* (*Bailiella*) *bufo* Hicks. *Ctenocephalus coronatus* Barr. *Solenopleura* ?-*depressa* Salt.

The *C. ? ecorne* Ang. Salter, Cat. Camb. Sil. Foss., p. 12, is a species of *Peltura*.

Conocoryphe ? *Homfrayi* Hicks. *Olenoides humerosus* Salt. *Apatokepalus invitus* Salt. *Olenus* (*Parabolinella* ?) *longispina* Belt. *Conocoryphe* *Lyelli* Hicks. *Peltura* ? *malverniana* Phillips. *Euloma monile* Salt. *Conocoryphe* ? *perdita* Hicks. *Olenus* (*Parabolinella*) *Planti* Salt. *Olenus* (*Cyclognathus*) *simplex* Salt. *Ctenocephalus* (*Hartella*) *solvensis* Hicks. *Solenopleura* ? *variolaris* Salt. *Angelina verisimilis* Salt. *Olenus* (*Parabolinella* ?) *Williamsoni* Belt.

——— Woodwardian Museum Notes. Salter's undescribed species.
Geol. Mag. London, Decade iv, vol. 7, 1900, pp. 303-308, plate.

Olenus (*Parabolinella*) *Planti* Salter, Cat. Camb. Sil., Foss., p. 11.

Olenus (*Ctenopyge*) *expansus* Salt., *ibid.*, p. 12.

Nesocuretus recurvatus (Hicks) Salter, Cat. Camb. Sil., Foss., p. 22.

Nesocuretus quadratus (Hicks) Salter, Cat. Camb. Sil., Foss., p. 22.

Nesocuretus sp. (*Homalonotus monstrator*) Salter, Cat. Camb. Sil., Foss., p. 22.

——— Woodwardian Museum Notes. Salter's undescribed species
No. 2.

Geol. Mag. London, Decade iv, vol. 8, 1901, pp. 5-14, plate.

Lichas scutalis Salter MSS. *Proctus Fletcheri* Salt., Cat. Camb. Sil., Foss., p. 134 (a 825, a 828).

——— Woodwardian Museum Notes. Salter's undescribed species
No. 3.

Geol. Mag. London, Decade iv, vol. 8, 1901, pp. 106-110, plate.

Phacops (*Odontocheile*) *caudatus* var. *corrugatus* Slater.

Encrinurus multiplicatus Salt., Cat. Camb. Mus. Sil., Foss., p. 51.

REED (F. R. Cowper)—Continued

——— Notes on the genus *Lichas*.

Quart. Jour. Geol. Soc. London, vol. 58, 1902, p. 50.

The author classifies the Lichadidae into two groups as follows:

Group 1—Protolichas:

Sec. A. Corydocephalus type *L. plamatus* Barr.

—B. Dicranopeltis type *L. scaber* Beyr.

—C. Platylichas type *L. margaritifera* Nieszk.

—D. Metopolichas type *L. verucosus* Eichw.

—E. Metalichas type *L. cicatricosus* Schm.

—F. Uralichas type *L. Ribeiroi* Delg.

—G. Ceratarges type *L. armatus* Goldf.

—H. Oncholichas type *L. ornatus*.

Group 2—Deuterolichas:

Sec. A. Hopolichas type *L. tricuspidatus* Beyr.

—B. Homolichas type *L. angustus* Beyr.

—C. Conolichas type *L. aequiloba* Steinh.

—D. Echinolichas type *L. Eriopis* Hall.

—E. Leiolichas type *L. illaenoides* Nieszk.

—F. Paralichas type *L. dalecarlicus* Ang.

—G. Terataspis type *L. grandis* Hall.

—H. Ceratolichas type *L. gryps* Hall.

The classification is based on (1st) a group with a pair of bi-composite lateral lobes to the glabella, and a more or less definite fourth pair of lateral lobes; (2nd) a group with a pair of tri-composite lateral lobes, originating by the fusion of the fourth pair, with the bi-composite pair of the preceding group.

——— Woodwardian Museum Notes. *Brachymetopus Strzalecki* McCoy.

Geol. Mag. London, Decade iv, vol. 10, 1903, pp. 193-197, figure.

The author remarks (on p. 196): "It seems open to question, whether the European species of *Brachymetopus* should not be regarded as constituting a distinct group or subgenus, for which the name *Brachymetopina* may be suggested."

——— The Lower Palaeozoic Trilobites of the Girvan District, Ayrshire.

Palaeontological Society London, Part 1, pp. 1-48, plates 1-6, December, 1903.

Part 2—pp. 49-96, plates 7-13, December, 1904.

Part 3—pp. 97-186, plates 14-20, December, 1906.

List of the species:

Agnostidae—*Agnostus agnostiformis* McCoy, *A. girvanensis* n. sp., *A. ferrugatus* Barr., *A. tardus* Barr.

Harpedidae—*Harpes Flanaganii* Portl.? *H.* sp. (a) to (c).

Trinucleidae—*Trinucleus Bucklandi* Barr., *T.*? *Maconochiei* Eth. & Nich., *T. subradiatus* n. sp., *T.* sp. ind. (a) to (g). *Ampyx depressus* Ang., *A. Drum-muckensis* n. sp., *A. Hornei* Eth. & Nich., *A. incurvus* n. sp., *A. Macallumi* Salt., *A. mammillatus* var. *Austini* Portl.? *A.* cf. *foveolatus* Ang., *A.* cf. *scanicus* Ang. *Dionide Lapworthi* Eth. and Nich., *D. Richardsoni* n. sp.

Olenidae—*Triarthrus Becki* Green? *Apatokephalus* sp. *Remopleurides Barrandei* Eth. and Nich., *R. (Teratorhynchus) bicornis* n. sp., *R. Colbii* Portl.? *R. correctus* n. sp., *R. dorsospinifer* Portl., *R. longicostatus* Portl., *R. Salteri* Reed *girvanensis* var. nov., *R.* cf., *nanus* Leucht., *R.* cf., *platyceps* McCoy. *Shumardia scotica* n. sp. *Salteria primaeva* Wyv. Thom. *Telephus fractus* Barr.

REED (F. R. Cowper)—Continued

Asaphidæ—*Asaphus* (*Isotelus*) *gigas* DeKay ? *A. Isotelus instabilis* n. sp., *Asaphus* sp. *Stygina latifrons* Portl. *Cyclopyge armata* Barr., *C. rediviva* Barr., *C. cf. gigantea* Barr. *Bohemilla* sp. *Ilacnus acmulus* Salt., also var. *I. balclachinensis* n. sp.; *T. Barriensis* Murch., *I. Bozemani* Salt ? and var. *longicapitatus* Reed, *I. Davisi* Salt., *I. extensus* n. sp., *I. latus* McCoy, *I. Macallumi* Salt., *I. memorabilis* n. sp., *I. Murchisoni* Salt. ? *I. nexilis* Salt., *I. Portlocki* Salt., *I. shallochensis* n. sp., *I. Thomsoni* Salt., *I. cf. oculosus* Holm., *I. cf. perovalis* Murch. *Ilacnus* sp.

Proctidæ—*Proctus girvanensis* Eth. and Nich., *P. latifrons* McCoy, *P. procerus* Eth. and Nich., *P. pseudolatifrons* n. sp., *P. Stokesi* Murch., *P. cf. obconicus* Lindstr., *Proctus* sp. *Cyphaspis megalops* McCoy. *Arethusina Konninski* Barr. ? *Phillipsinella parabola* Barr. *Menocephalus* ? (*Tornquistia*) cf. *Nicholsoni* Reed.

Brontidæ—*Bronteus Andersoni* Eth. and Nich., *B. craigensis* n. sp., *B. Grayi* n. sp. *Bronteus* sp. ind. (a) and (b). *Brontopsis ardmillancensis* n. sp., *B. scotia* Salt.

Lichadidæ—*Lichas* (*Corydocephalus*) *anglicus* Beyr.

Lichas (*Corydocephalus*) *Geiki* Eth. and Nich.

Lichas (*Corydocephalus*) *scutalis* Salt.

Lichas (*Corydocephalus*) cf. *Wesenbergensis* Schm.

Lichas (*Platylchas*) *Grayi* Fletch., also var. *scoticus*.

Lichas (*Platylchas*) *laxatus* McCoy.

Lichas (*Metopolichas*) *bulbiceps* Phill. var. aff. *marginatus* Lindstr.

Lichas (*Amphilchas*) *hibernicus* Portl.

Lichas (*Conolichas*) cf. *acquiloba* Steinh. also sp. ind. (a).

Lichapyge ? *problematica* n. sp.

Acidaspidæ—*Acidaspis Barrandei* Fletch. and Salt., *A. callipareos* Wyv. Thom., *A. coronata* Salt., *A. deflexa* Lake, *A. Grayae* Eth., *A. hystrix* Wyv. Thom., *A. lalage* Wyv. Thom., *A. dalecarlica* Tornq.

Encrinuridæ—*Encrinurus punctatus* Brunn var. *calcareus*, *arenaceus*.

Encrinurus multisegmentatus Portl. *Cybele* cf. *aspera* Linnrs., *C. bellatula* Dalm., *C. Løweni* Linnrs. var. nov. *girvanensis*, *C. verrucosa* Dalm., *C. sp. ind.* (a) and (b). *Dindymene cordai* Eth. and Nich.

Calymmenidæ—*Calymmene Blumenbachi* Brong. also var. *drummuckensis*, *C. cambrensis* Salt., *C. planimarginata* n. sp., *C. sp. ind.* (a) and (b).

Cheiruridæ—*Cheirurus bimucronatus* Murch., *C. gelasinus* Portl., also var. *Cheirurus* (*Cyrtometopus*) *octolabatus* McCoy, *C. (Nieszkowskia) unicus* Wyv. Thom., *C. (Sphaerocoryphe) Thomsoni* n. sp., *C. (Youngia) tripinosus* Young. *Cheirurus* sp. (a) and (b). *Deiphon Forbesi* Barr. *Sphaerexochus mirus* Beyr. *Staurocephalus globiceps* Portl. *Pliomera* sp.

Phacophidæ—*Phacops* (*pterygomctopus*) *Brongniarti* Portl.

Phacops (*Phacopidella*) *Downingiae* Murch.

Phacops (*Phacopidella*) *elegans* Sars and Boeck.

Phacops (*Chasmops*) *Bisetti* n. sp.

——— Sedgwick Museum Notes. New fossils from the Haverford-west District.

Geol. Mag. London, Decade v, vol. 1, 1904, pp. 106-109, plate.

Phacops Robertsi n. sp.

REED (F. R. Cowper)—Continued

——— Sedgwick Museum Notes. New fossils from the Haverfordwest District. No. 2.

Geol. Mag. London, Decade v, vol. 1, 1904, pp. 383-388, plate.

Phacops (*Dalmanites*) *socialis* Barr. var. *P.* (*Dalmanites*) aff. *incertus* Deslong.
Phacops (*Chasmops*) *conicophthalmus* Boeck. *Phacops* (*Chasmops*) *macroura* Sjögren.
Encrinurus multisegmentatus Portl.

——— Sedgwick Museum Notes. New fossils from the Haverfordwest District. No. 3.

Geol. Mag. London, Decade v, vol. 2, 1905, pp. 97-104, plate.

Harpes sp.—*Ampyx* cf. *rostratus* Sars. *Remopleurides Salteri* Reed var. *girvanensis*.
Cyphaspis megalops (McCoy), *C.* cf. *Harknessi* Reed. *Acidaspis* (*Ceratocephala*) *Turnbulli* nov., *A.* (*C.*) *sladensis* nov. *Lichas* (*Metopolichas*) *affinis* Aug. var., *L.* (*M.*) *laciniatus* Dalm ? *L.* (*Platylichas*) *margiritifer* Nieszk. var. *Cheirurus* (*Pseudosphæræochus*) aff. *subquadratus* Reed.

——— The classification of the genus *Phacopidae*.

Geol. Mag. London, Decade v, vol. 2, pp. 171-178 and 224-228.

The author classifies the genus as follows:

1. Sub-family Dalmanitinae subgenera Dalmanitina:

SYNPHORIA. {

Dalmanites sens str. *Haumanannia*.
Asteropyge.
Odontocephalus.
Corycephalus.
Malladaia.
Coronura.
Probolium.
Cryphina.
2. Sub-family phacopinae. 2—Genus *Phacops*, subgenera *Phacopidella*:

Phacops sens str.
 (*Somatrikelon*).
Trimerocephalus.
3. Sub-family Pterygometopinae, Genus *Pterygometopus*:

Subgenera *Pterygometopus* sens st.
Chasnops.
Homalops.
Monorakos.

——— Sedgwick Museum Notes. Crustacea from Girvan.

Geol. Mag., Decade v, vol. 4, 1907, pp. 108-115, plate iv.

Anatifopsis balclatchiensis n. sp. *Pinnocaris curvata* n. sp. *Solenocaris solenoides* Young. *Ceratiocaris* (*Solenocaris*?) sp. *Helminthochiton Grayiae*, H. Woodw. *Chiton* sp.

——— Sedgwick Museum Notes. A new species of *Lichas*.

Geol. Mag., Decade v, 1907, vol. iv, pp. 396-400, plate xvii.

Lichas (*Homolichas*) *melmerbiensis* n. sp.

——— New fossils Haverfordwest.

Geol. Mag., Decade v, vol. v, 1908, pp. 433-436, pl. xiv.

Typhloniscus princeps n. sp.

The only species of this genus previously described was *T. Baini* Salter, from South Africa.

REED (F. R. Cowper)—Continued

——— A new species of *Cyclus* from the Carboniferous Limestone of Ireland.

Geol. Mag., Decade v, vol. v, 1908, pp. 551-552.

Cyclus simulans n. sp.

——— On *Phacops Weaveri*, Salter.

Geol. Mag., Decade v, vol. vi, 1909, p. 69.

Refers only the *Phacops Weaveri* Salt. Mong. Brit. Tril., plate iv, fig. 7, from Llandovery rocks of the Tortworth area.

——— Rocks of the Tonnakeady District. VII Palæontological Appendix.

Quart. Jour. Geol. Soc. London, vol. 65, 1909, pp. 151-152, pl. 6.

Iliaenus Weaveri n. sp. closely resembles, *I. esmarkii* Schloth., *I. aff. chudleighensis* Holm., *Pliomera aff. Fischeri* Eichw., *P. aff. Barraudei* Billings.

Cybele connemara n. sp. Encrinurus sp.

The author compares *E. varicosatus* Walc., and *E. vannulus* Clarke. It differs in the shape of the pygidium and course of the lateral ribs. *Acidaspis* sp. *Apatocephalus* sp. ? and *Telephus hibernicus* n. sp. also *Symphysurus* ? sp.

——— The Cambrian fossils of Spiti.

Memoirs Geol. Sur. of India, ser. xv, vol. 7, Memoir No. 1, Calcutta, 1910, 76 pp., plates 1-6.

The author describes the following species of Trilobites:

Agnostus spitiensis n. sp.

There are considerable affinities between this species and *A. acadicus* Hartt, also with *A. montis* Matthew.

Microdiscus: The author uses *M. punctatus* Salter for the type of the genus and not *M. quadricostatus* Emmons, certainly the young of the Trinucleus from the Hudson River group; and remarks, "Should *Pemphigaspis bullata* Hall, prove to belong to this genus, this name will have to be adopted as Emmons founded his genus Microdiscus on a young of another genus."

Matthew Trans. N. Y. Acad. Sci., 1896, p. 236, remarks, as a general rule, in the genus Microdiscus the number of rings in the axis of the pygidium increase according to the geological age of the species. The majority of those of the Olenellus zone have but few rings (4 to 6), but in the Paradoxides zone species with many rings (8 to 10, even 12) are multiplied.

He divides the genus into four Sections: With long glabella—Section 1, Lobatus; Section 2, Speciosus. With short glabella—Section 3, Dawsonia; Section 4, Eodiscus.

The following Himalayan species are described and illustrated:

Microdiscus Griesbachi sp. nov. The species agrees in general characters with *M. connexus* Walcott, *M. haimantensis* sp. nov. *Redlichia Noetlingi* Redlich.

The author remarks that this species is very closely related to *R. nobilis* Walcott. Indeed, it seems difficult to separate the new Chinese species *R. chinensis* Walcott, *R. fualis* Walcott and *R. nobilis* Walcott, by any strongly marked and constant features from the Indian species.

Zacanthoides indicus sp. nov. *Oryctocephalus Salteri* sp. nov., *O. cf. Reynoldi* Reed.

Under the genus Ptychoparia, Corda, 1847, the author remarks:

There has been extraordinary diversity in the use of the generic name Ptychoparia, and in spite of the recent efforts of palæontologists to bring order out of chaos it cannot be said that uniformity of usage prevails at the present date.

REED (F. R. Cowper)—Continued

He also remarks with regard to Ptychoparia that there happily cannot be any dispute as to the type of the genus, for Corda's first described species, *Ptychoparia striata* Emmerich, is well known and universally acknowledged.

Reed quotes Corda's original description of the genus and remarks that Pompeckj agrees with this strict limitation of the generic name Ptychoparia, but instead of regarding it as a subgenus of Conocephalites, as Wallerius did, prefers to place the latter as a subgeneric division of the genus, which is followed by the author with *C. Emmerichi* Barrande, as a type.

With regard to the genus Liostracus Angelin, the author quotes Matthew's divisions of the genus Ptychoparia and Liostracus, and remarks that the only constant differentiating feature of value is the shape of the genal angle, spined or rounded.

Matthew takes *L. aculeatus* as a type, but Brögger is followed by Wallerius in regarding the genal angles as typically spined, as in *L. costatus* Angelin. Reed places the genus as a subgenus to Ptychoparia.

Also Conocephalites, with *C. Emmerichi* Barrande, as a type. The leading characteristics of it are: 1—the long narrow eyes; 2—the position of the eyes near the glabella; 3—the course of the facial sutures, which behind the eyes run out almost horizontally before bending back; 4—the furrow on the eye lobes; 5—the absence of ocular ridges; 6—the flat border.

The author describes *Ptychoparia spitiensis* sp. nov., *P. Stracheyi* sp. nov., *P. urceolata* sp. nov., *P. consocialis* sp. nov., *P. admissa* sp. nov., *P. perzulgata* sp. nov., *P. maopoenis* sp. nov., *P. defossa* sp. nov. *Ptychoparia (Liostracus) cizvica* sp. nov.

Subgenus Conocephalites: *Ptychoparia (Conocephalites) memor* sp. nov., *P. (C.) hesterna* nov. sp.

Subgenus A. *Ptychoparia hostilis* sp. nov., *P. praeterita* sp. nov.

Subgenus B. *Ptychoparia himalaica* sp. nov.

Bathyriscus Stoliczkae sp. nov.

Dicellocephalus interpres sp. nov. The author compares it with *D. Duvineci* Billings and other species, remarking that *D. Duvineci* and *D. Hisingeri* of Billings cannot rightly be retained in the genus Dicellocephalus.

Genus Agrauios Corda, *A. aff. Roberti* Matthew, *A. simulans* sp. nov., *A. ? feravidus*.

Anomocare Angelin, 1854, *A. conjunctiva* sp. nov.

The peculiar course of the marginal furrow, so as to make a broad V in front of the glabella, occurs also in several species attributed to Ptychoparia, *P. sp. ind.* Walcott, from Yellowstone, and *P. tener* Billings. The author compares *A. Angelini* Grönwall. *Anomocare* sp.

Schantungia Lorenz, 1906, *S. cf. frequens* Dames.

Reed remarks, that unfortunately the name Schantungia is apparently preoccupied, Walcott having employed it for a type of trilobites from China in 1905, but without a figure. If it is proved that the type of Walcott's Schantungia and Lorenz's Schantungia belong to different genera a new name must be given to this group or genus containing Dames' *C. frequens*.

Olenus haimantensis sp. nov.

The author compares *O. attenuatus* Boeck.

—— Paleontological Notes.

The Ordovician of the Glensaul District by C. I. Gardiner and S. H. Reynolds. Quart. Jour. Geol. Soc. London, vol. 66, 1910, pp. 271-278, plates 20-2

The author describes *Illacnus Waezerei* Reed, *Niobe* sp. *Nileus armadillo* Dahnan. *Bathyrullus glensaulensis* sp. nov.

This genus has not been previously recorded from the British Isles.

REED (F. R. Cowper)—Continued

The author compares *B. formosus* Bill., *B. expansus* Bill. and *B. brevispinus* Raymond. *Bathyrurus* cf. *Timon* Bill., *B. aff. nero* Billings.

Pliomera pseudoarticulata Port. *Encrinurus octocostatus* sp. nov. *Phacop* (*Chasmops*) aff. *Odini* Eichwald.

——— Sedgwick Museum Notes. *Dionide atra*, Salter.

Geol. Mag., Decade 5, No. 5, vol. 9, p. 200, plate 11.

The author includes the *Trinucleus Ramsayi* Hick., 1875, under this species. The author remarks the many points of affinity possessed by the head shield with other genera, indicate the intimate relations of *Dionide* with *Harpes*, *Harpides* and *Erinnys*.

——— New fossils from the Dufton Shale.

Geol. Mag., Decade v, vol. 7, No. 5, 1910, p. 211, plates 16 and 17.

Trinucleus Nicholsoni sp. nov.

The author remarks: *T. ornatus* (Sternb.) Barrande seems closely allied to our Dufton species in the shape of the head shield, nuchal spine, pits in axial furrows, tubercle on glabella, and radial arrangement of the pits on the fringe, but these pits are more numerous and smaller.

Acidaspis semievoluta sp. nov., *Homalonotus ascriptus* sp. nov.

Ostracoda: *Beyrichi* (*Ceratopsis*) *duftonensis* sp. nov., *B. (Ctenobolbina) ? superciliata* sp. nov., *B. (Tetradella) Turnbulli* sp. nov.

——— Sedgwick Museum Notes. On the genus *Trinucleus*.

Geol. Mag., Decade v, vol. 9, p. 346, pl. 18, 1912.

The author discusses the fringe of *Trinucleus*, the double nature of the fringe, the character of the pits, arrangement of the pits. Difference in the upper and lower surfaces of the fringe, the outer and inner bands and the position of the girder.

The plate illustrates *Trinucleus concentricus* Eaton, *T. hibernicus*, *T. fimbriatus* Murch., *T. seticornis* His., *T. Nicholsoni* Reed, *T. subradiatus* Reed, *T. favus* Salter and *T. Murchisoni* Salter.

——— Sedgwick Museum Notes. On the genus *Trinucleus*.

Geol. Mag., Decade 5, vol. 9, pp. 385-394, pl. 19, part 2, 1912.

The author figures the upper and lower surface of fringe of five species of the genus *Trinucleus*.

Trinucleus hibernicus Reed, *T. fimbriatus* Murch., *T. Murchisoni* Salter, *T. Nicholsoni* Reed and *T. seticornis* Hisinger.

Reid (James) and Macnair (Peter). On the genera *Psilophyton*, *Lycopodites*, *Zosterophyllum* and *Parka decipiens* of the Old Red Sandstone of Scotland, their affinities and distribution.

Trans. Edinb. Geol. Soc., vol. 7, 1899, pp. 368-380.

Remelé (A.) Zwei neue Trilobiten aus undersilurischen Diluvial Geschieben von Eberswale.

Zeitschr. Deutsch Geol. Ges., vol. 37, 1885, p. 1032.

Rhinaspis erratica n. sp. and subgen. of *Meglaspis*.

Hydrocephalus Hauchecornei gen. et sp. nov. of *Ampyx*.

Remes (M. Poznamky). Trilobitech Celechovského Devonu.

Prostejove, 1913.

The author describes *Bronteus granulata* Goldf. *Lichas* cf. *armata* Goldf. *Gyphaspis ceratophthalmoides* Rud. Richter. *Proetus moravicus* Smycka. *Schizoproetus celechovicensis* Smycka (emend Rud. Richter).

REED (F. R. Cowper)—Continued

Dechenella subgen. *Eudechenella* n. gen.

Dechenella (*Eudechenella*) *ritthbergensis*. H. Zimmermann emend Rud. Richter.

The author illustrates *Cyphasps ceratophthalmoides* Rud. Richter.

Reynolds (S. H.) Certain fossils from the Lower Palaeozoic rocks of Yorkshire.

Geol. Mag. Decade iv, vol. 1, 1894, p. 108, plate 4.

The author illustrates *Staurocephalus* cf. *Murchisoni* Barr.—a pygidium. *Dindymene Hughesiae* Roberts MS., entire figure.

The author compares the new species with *D. ornata* Linrs., *D. Frederici Augusti* Barr., *D. Haidingeri* Barr and *D. Cordai* Eth. and Nich., remarking the differences in the number of large tubercles on the glabella in each and the new form.

Richter (Reinard) and Unger (Franz). Beitrag zur Paläontologie des Thüringer Waldes.

K. Akad. der Wissench. mathem. naturw Bd. cixi, 1856.

Cytherina: *Phacops* ? *granulatus* Münster. *Calymene marginata* Münster, *C. furcata* Münster.

Phacops cryptophthalmus Emm., *P. macrocephalus* Richter, *P. mastophthalmus* Richter *Phacops* sp.

Dalmanites punctata Steininger, *Cylindraspis* sp., *C. latispinosa* Sandb. Pygidium. ?

Cypridina serrato-striata Sandb., *C. globulus* Richter, *C. gyrata* Richter, *C. taeniata* Richter, *C. calcarata* Richter.

Richter (Rudolf). Beiträge zur Kenntnis devonischer Trilobiten aus dem Rheinischen Schiefergebirge Vorbericht zu einer Monographie der Trilobiten der Eifel. Dissert. Marburg, 1909.

The author describes *Proctus Cuvieri* Steininger, 1831, including two var. *laevigata* Goldf. and *granulosa* Goldf. *Proctus cornutus* Goldf., referring *Proctus Holzapfeli* to the species. *Proctus tenuimargo* nov. for *P. cornutus* Beyr. non Goldf. *Proctus (Tropidocoryphe) filicostus* Novák, 1890, *P. crassimargo* Römer.

Cyphasps ceratophthalmus Goldf. and *C. hydrocephala* Römer.

Dechenella Vernuili Barr., *D. Burmeisteri* nov. for *Tril verticalis* Burmeister, 1843, pl. V, fig. 9a, not 9b. *Dechenella Kayseri* nov., *D. Romanowski* Tschern, *D. Tschernyschewi* nov., *D. uralica* nov.

Harpes macrocephalus Goldf. refers *H. ungula* Burmeister, 1843, to this.

Lichas armata Goldf. var. *berolinensis* and *geesiana* nov. *Lichas beryllifera* nov., *L. parvula* Novák, syn. *L. Haueri* Barr., pl. 28, fig. 38, non 39-40.

Acidaspis elliptica Burmeister refers *Arges armata* Goldf. 1839, pl. 33, fig. 1e and d, non a, b, c. *Odontopleura dentata* Goldf., 1843, and *Acidaspis armata* Römer, 1876, Atlas, pl. 31, fig. 7, to this species.

Acidaspis aries nov., *A. radiata* Goldf. refers *A. pilata* Whidborne, 1889, and *A. lacrata* Barr. to this species.

Cryphaeus rotundifrons Emm. the author refers *C. laciniatus* Roemer, and *C. acutifrons* Schlüter, to this species.

Cryphaeus Drevermanni nov. for *C. laciniatus* Drevermann, 1902. *Cryphaeus boopis* nov., *C. Kochi* Kayser, *C. Lethaeae* Kayser, for *Pleuracanthus laciniatus* Roemer, 1844, and that of *Lethaea* Pal. Atlas, pl. 25, fig. 10, 1876.

Cryphaeus diadema nov., *C. cometa* nov., *C. punctatus* Steininger, 1833, the *Calymene archnoides* Höninghaus and other authors.

RICHTER (Rudolf)—Continued

Cryphaeus stellifer Burmeister, 1843.

Acaste Schmidtii nov. *A. Henni* nov., *A. nolens* nov.

—— Das übergreifen der pelagischen Trilobitengattungen *Tropidocoryphe* and *Thysanopeltis* in das normale Rheinische Mitteldevon der Eifel und Belgiens.

Centralblatt für Mineral Geol. and Paläont. Jahrg., 1914, No. 3.

The author gives a figure in the text of *Tropidocoryphe Barroisi* Maillieux and refers to the genus *Tropidocoryphe ascania* (Corda), *T. memmon* (Corda), also *T. filicostata* Novák, the genotype.

The author figures *Thysanopeltis acanthopeltis* (Schnur.).

—— Über das Hypostoma und einige Arten der Gattung *Cyphaspis*.

Centralblatt für Mineral Geol. Paläont. Jahrg., 1914, No. 10.

The author illustrates *Cyphaspis hydrocephala* Röm., *C. ceratophthalmus* Goldf., and two new species: *Cyphaspis ceratophthalmoides* and *stigmatophthalmus*.

—— Beiträge zur Kenntnis devonischer Trilobiten.

1 Die Gattung *Dechenella* und einige verwandte Formen. Abhandl. d. Senckenb. Natuf. Gesellsch., Bd. 31, 1913, 9 text figures, 4 plates.

The author divides the *Dechenella* into one new genus and three subgenera:

(A.) *Basidechenella* nov. subg.

(B.) *Eudechenella* nov. subg.

(C.) *Paradechenella* nov. subg.

(D.) *Dechenella*.

(E.) *Schizoproetus* nov. gen.

Under the subgenus *Basidechenella* the author places:

Dechenella (Basidechenella) Kayseri Rud. Richter.

D. (B.) dombroviensis Gürich, *D. (B.) onyx* nov.

Dechenella sp. Beushausen and *D.* sp.

Under the subgenus *Eudechenella*.

Dechenella (Eudechenella) Verneuli Barrande, syn. *Archegonus aequalis* Steininger, 1853, and *Phillipsia verticalis* Kayser, 1878.

Dechenella (Eudechenella) aff. *Verneuli* sp. A-B-C.

Dechenella (Eudechenella) Burmeisteri Rud. Richter syn. *Phillipsia verticalis* Kayser, 1878; *Tril. verticalis* Schlüter, 1880.

Dechenella verticalis Oehlert, 1885, Kayser, 1880, and Asselbergs, 1912, under *Dechenella Verneuli* Kayser, 1880, Oehlert, 1885, Schmidt, 1905.

Dechenella (Eudechenella) granulata n. sp.

Dechenella (Eudechenella) rittergensis Zimmermann, 1892.

Dechenella (Eudechenella) setosa Whidborne, 1889.

Dechenella (Eudechenella) Romanoński Tschernyschew, 1887.

Dechenella (Eudechenella) Polonica Gürich, 1896.

C. Under the subgenus *Paradechenella* the author describes:

Dechenella (Paradechenella) Tschernyschewi Rud. Richter, 1909.

Dechenella hofensis Leyh., 1897.

Dechenella waigatschensis Tschernyschew and Yakovlew, 1898.

Dechenella disjecta n. sp.

Dechenella dubia n. sp.

Phillipsia (Dechenella) cfr. *setosa* (Whidborne) Gortani.

Dechenella incerta Oehlert, 1889.

Proetidarum genus *uralicum* (Rud. Richter) the *Dechenella Haldemanni* Tschernyschew (non Hall), 1887.

RICHTER (Rudolf)—Continued

Under the new genus *Schizoproetus* the author places:

Schizoproetus clechovicensis (Smyčka), 1895.

The work also includes notes on *Proetus unguoides* Barr. and *Phillipsia raclawicensis* Jarosz. The first referred by Gortani, 1907, to *Dechenella*, and the second by its author to that genus.

——— Beiträge zur Kenntnis devonischer Trilobiten.

Abhandl. der Senckenbergischen Nat. Ges. Bd. 31, 1913, pp. 346-423, plates 22 and 23.

The author describes and illustrates under (A.) *Drevermannia* n. genus, *D. Schmidtii* n. sp., *D. brecciae* n. sp., *D. adorfensis* n. sp., *D. nodannulata* n. sp., *D.* n. sp., a, b, *D. globigena* n. sp., *D. carnica* n. sp., *D. ? formosa* nov.

Under (B) *Cyrtosymbole*, new genus, the following species:

Cyrtosymbole Escoti Koenen, 1886; described under the genus *Dechenella* by Koenen Frech in 1887.

Cyrtosymbole n. sp., *C. nana* n. sp., *C. calymmene* n. sp., *C. bergica* n. sp., *C. æildungensis* n. sp., *C. Ussheri* Ivor Thomas (*Dechenella Ussheri* Thomas, 1909).

Cyrtosymbole dillensis (described by Drevermann, 1901, under *Proetus*), *C. pusilla* (described by Gürich, 1896, under *Dechenella*), *C. elegans* (described by Münster, 1842, under the genus *Otarion*), *C. Vinassai* (described by Gortani, 1907, under *Dechenella*), *Cyrtosymbole* sp., *C. italica* Gortani.

Under (C) *Typhloproetus* Frech nomen MSS.: *T. microdiscus* Frech mscr., 1909.

Under (D) *Pteroparia* n. gen., *P. columbella* n. sp.

Under (E) *Proetus* (*Euproetus*) nov. subgen. *Euproetus bivallatus* n. sp. and *E. glacensis* n. sp.

Under (F) *Prætidae* (subg.): *P. subcarintiacus* n. sp., *P. carintiacus* Drevermann, *P.* ex. aff. *carintiacus* Drevermann, *P. pusillus* Münster, (described under *Asaphus* Münster, 1840), *P. ebersdorfensis* n. sp., *P. Gortanii* n. sp., *P. palensis* n. sp., *P. Gümbeli* (The *Asaphus Cazadori* Münster, 1840), *P. anglicus* n. sp., *P. eurycraspedon* n. sp., *P. marginatus* (*Calymmene marginata* Münster, 1842).

Under (G) *Euproetus macrophthalmus* (*Cylindraspis macrophthalmus* Sandberger, 1850-56.):

Proetus (subg.) *furcatus* (*Calymmene furcata* Münster, 1842).

Proetus (*Calymmene*) *furcatus* Richter, 1856, non Münster.

Proetus Münsteri (*Calymmene marginata* Richter and Unger, 1856).

Proetus Münsteri (*Calymmene marginata* Münster, Richter, 1869).

Proetus (*Otarion*) *elegans* Richter, 1869: *P. tenellus* Richter, 1869, *Proetus* (subg.) n. sp. a-c.

Trilobites Münsteri Gümbel, 1879. (*Ignostus pisiformis* Münster, 1840).

Proetus sp. indet. Tietze, 1870; *Proetus* cfr. *Phocion* Billings Gortani, *Proetus* sp. indet. Gortani, *Proetus* f. ind. Rzehak. *Proetus ackensis* Born, 1912, *P.* sp. Born.

——— Neue Beobachtungen über den Bau der Trilobitengattung *Harpes*.

Geol. Anzeiger, Ba. 45, No. 4, 1914.

Harpes macrocephalus Goldfuss.

Ritter (R.) 1—Aus dem thüringischen Schiefergebirge.

Zeitsch. Deutsch. Geol. Ges., vol. 15, Heft 4, 1863, pp. 659-676, plates 18-19.

Harpes radians n. sp. *Proetus dormitans* n. sp., *P.* sp. *Phyllaspis raniceps* n. gen. et sp. *Arctusina* sp. *Phacops strabo* n. sp., *P. pyrifrons* n. sp., *P. Roemeri* Geinitz.

RITTER (R.)—Continued

P. liopygus n. sp. *Acidaspis myops* n. sp. *Beyrichia (Leperditia) armata* n. sp., *B. Kłodni* McCoy, *B. subcylindrica* nov.

Corrections for reference on page 184, Bibliography Palæozoic Crustacea.

——— Der Kulm in Thüringen.

Zeitsch. Deutsch. Geol. Ges., 1864, p. 155.

Proctus posthumus n. sp. *Cythere spinosa* n. sp.

——— Untersilurische Petrefakten aus Thüringen.

Zeitsch. Deutsch. Geol. Ges., 1872, p. 72.

Calymene sp. *Asaphus marginatus* n. sp. *Beyrichia excavata* n. sp.

Roberts (George L.) On some Crustacean Tracks from the Old Red Sandstone near Ludlow.

Quart. Jour. Geol. Soc., vol. 19, 1863, pp. 233-235.

——— and **Randall (John)**. On the Upper Silurian Passage beds at Linley, Salop.

Quart. Jour. Geol. Soc., vol. 19, 1863, pp. 229-232.

Roemer (F.) Geoghostische Beobachtungen im polnischen Mottelgebirge.

Zeitschr. d. Deutsch. Geol. Ges., Bd. xviii, 1866.

Phacops cryptophthalmus Emm. Roemer's pl. xiii, figs. 6-7, has been described by Prof. Frech as *Phacops (Trimerocephalus) anophthalmus* n. sp. *Lethaea Palæozoica*, Bd. 2, pp. 124, 178, 179, 180.

——— *Eurypterus lacustris* von Buffalo, New York.

55 Jahrestes der schles. Ges., 1877.

Rogers (Austin F.) Some new American species of Cycles from the Coal Measures.

Contributions Geol. Dept. Columbia Univ., No. 88, vol. X, 1902.

Kansas Univ. Bull., vol. 1, 1902, pp. 269-275, plate 14.

Cyclus communis n. sp., *C. Packardii* n. sp., *C. permarginatus* n. sp., *C. limbatus* n. sp., *C. minutus* n. sp.

Rouault (Marie). Notice sur quelques espèces de fossiles du Terrain Devonien du nord du Dept. de la Manche.

Bull. Soc. Geol. France, vol. 12, 1855, p. 1040.

Homalonotus Forbesi n. sp.

Add to the reference on p. 190, Bib. Pal. Crust., under Mem. Palæozoiques des environs de Rennes, 1851, the following species: *Cyphaspis Gaultieri* n. sp. *Phacops Michelini* n. sp. and *Beyrichia Hardouinina* n. sp.

Rowley (R. R.) Descriptions of Fossils.

Contributions to Indiana Palæontology, Green, New Albany, vol. 2, part 2, pp. 21-31, plate, 1906.

Gives systematic descriptions of various species of Trilobites and Crinoids.

——— The Geology of Pike County.

Missouri Bureau of Geol. and Mines, vol. 8, 2nd series, 1907, 122 pp., 20 plates and map.

ROWLEY (R. R.)—Continued

The author notes and illustrates the following Ordovician Trilobites:

Iliaenus taurus Hall. *Asaphus gigas* DeKay, *A. megistos* Locke. *Lichas trentonensis* Conrad, *Iliaenus* sp.

Carboniferous Crustaceans *Phillipsia Strantton Porteri* n. sp., *P. Missouriensis* Shumard.

Ruedemann (Rudolf). Trenton conglomerate of Rysedorph Hill, Rensselaer County, New York, and its fauna.

Bull. N. Y. Museum, No. 49, 1901, pp. 3-114, plates 1-7.

Tretaspis reticulatus n. sp., *T. diademata* n. sp.

These species are specially characterized by the presence of the glabellar pits, the apical tubercle on the glabella and the ocular tubercles, the eye lines, the deep dorsal furrow, and the structure and profile of the marginal border. *T. seticornis* His. is the typical form.

Amphyx (Lonchodomas) hastatus n. sp. *Remopleurides tumidus* n. sp., *R. (Caphyra) linguatus* n. sp. *Isotelus maximus* Locke. *Gerasaphes Ulrichana* Clarke. *Iliaenus Americanus* Bill. *Thaleops ovata* Conrad. *Cyphaspis matutina* n. sp., *C. hudsonica* n. sp. *Bronteus lunatus* Bill. *Cybele* sp. *Calymmene senaria* Conrad. *Ceraurus pleurexanthemus* Green. *Sphaerocoryphe major* n. sp. *Dalmanites aches* Bill. *Pterygometopus eboraceus* Clarke, *P. callicephalus* Hall.

Ostracoda: *Leperditia fabulites* Conrad, *L. resplendens* n. sp. *Isochilina armata* Walc. var. *pygmaea* n. var. *Aparchites minutissimus* Hall var. *robustus* n. var. *Schmidtella crassimarginata* Ulrich var. *ventrilabiata* n. var. *Eurychillina reticulata* Ulrich, *E. bulbifera* n. sp., *E. ? solida* n. sp., *E. subradiata* Ulrich var. *rensselaerica* nov., *E. dianthus* nov., *E. ? anthus* n. sp., *E. obliqua* n. sp., *Primitia mundula* Miller var. *Jonesi* n. var. *Bollia cornucopiae* n. sp. *Macronotella Ulrichi* n. sp., *M. fragaria* n. sp. *Bythocrypis cylindrica* Hall. *Lepidocoleus Jamesi* H. & W.

——— The Lower Silurian shales of the Mohawk Valley.

N. Y. State Museum Bull., 162, 1912.

The author illustrates *Eoharpes ottawensis* Billings.

Proetus undulostriatus Hall.

This is the *Olenus undulostriatus* Hall describes in Pal. N. Y., 1847, p. 258, pl. 67, fig. 3 a-b. The author doubtfully refers *Proetus parviusculus* Hall, of the 13th Report N. Y. State Mus., 1860, p. 120, and the *Proetus parviusculus* Ruedemann, Bull. 42, 1901, p. 536, and *Cyphaspis hudsonica* Ruedemann, Bull. 49, 1901, p. 64, pl. 4, figs. 8 and 9, to this species.

Acidaspis crossota Locke. *Calymmene senaria* Conrad. *Isotelus gigas* DeKay.

Ostracoda: *Ulrichia bivertex* Ulrich. *Eurychilina subradiata* Ulrich. *Primitiella unicornis* Ulrich var. *Ceratopsis chambersi* Miller var. *Technophorus cancellatus* nov. *Pollicipes siluricus* Ruedemann, a barnacle from Snake Hill beds of Green Island, New York.

——— Palaeontologia Universalis, Fasc. 1, Ser. IV. Dr. Jacob Green's original of description North American Trilobites.

Calymene callicephala, original specimen N. Y. State Museum, pl. 233.

Calymene platys, original specimen N. Y. State Museum, pl. 234.

Asaphus micrurus, original specimen N. Y. State Museum, pl. 235.

Ceraurus pleurexanthemus, original specimen N. Y. State Museum, pl. 236.

The author quotes Dr. Green's monograph Trilobites of North America, published Oct. 1, 1832, for original description of the species illustrated. This is an error. The Synopsis of the Trilobites of North America, issued in June, 1832, in The Monthly

RUDEMANN (Rudolf)—Continued

American Journal of Geology and Natural Science, pp. 558-560, plate 14, was the original publication in which Dr. Green figures *Asaphus micrurus*, fig. 3, and *Ceraurus pleurexanthemus*, fig. 10.

——— Account of some new or little known species of fossils, mostly from Palaeozoic rocks of New York.

Bull. New York State Mus., No. 189, 1916.

The author describes the following Crustacea:

Agnostus Cushingi nov.

It differs from *A. Newttonensis* Weller and its congeners in the broad, anteriorly well-rounded convex cranidium and obscure glabella.

Amphilichas conifrons nov.

This species differs from *A. Trentonensis* Hall, in the entirely different outline of the middle lobe of the glabella, which in the former is widest behind and in the new species broadens forward.

Ceratiocaris (Limnocraris) salina nov.

Spathiocaris Emersoni Clarke.

These specimens differ markedly from the strange valves figured with *S. Emersoni* on plate 34, fig. 13, Pal. N. Y., vol. 7, which latter possesses a much broadened flat posterior fold and a very shallow anterior notch. The author makes a new species of this form, referring it to *Pholadocaris Lutheri*.

Spathiocaris lata nov., *S. chargrinensis* nov., *S. Cushingi* nov., *S. Williamsi* nov. This is of larger size than the congeners and is readily distinguished by its broad form and coarse lines.

On p. 98 the author gives a discussion on the genera *Spathiocaris* and the *Discinocrina* and certain organic bodies called *Cardiocaris*, *Pholadocaris*, etc., by Woodward and Clarke, considered as Crustaceans by other authors (Roemer, DeVerneuil, Kayser and Dames) as aptychi of Goniatites.

Lepidocoleidae. Anatifopsis Wardelli nov.

Pseudoniscus.

The eyes of this genus have for some time been an object of speculation. Nieszkowski, pl. 2, fig. 15, who first described a *Pseudoniscus*, figured a small incision along the edge of the fixed cheek as place for the eye; Eichwald *Lethaea* Ross, p. 1445, speaks there of large lunular eyes, and Woodward, Mong. of the Merostoma, p. 177, fig. 65, restored the cephalon completely with eyes.

The author describes. *Pseudoniscus Roosevelti* Clarke and *P. Clarkei* nov., a Bertie Waterline species.

Echinognathus Clevelandi Walcott. *Eusarcus trigonus* nov.

Article II. Notes of the habitat of the Eurypterids.

Article IV. A new *Ceraurus* from the Chazy, by Percy E. Raymond. *Ceraurus Ruedemanni* nov.

Article V. The presence of a median eye in Trilobites.

Gives figures in text of *Isotelus gigas* and *Basilicus tryannus*. It is claimed in this paper that most, if not all, Trilobites possessed a median or parietal eye on the glabella. A great number of species, belonging to more than 30 genera, possess a distinct tubercle on the glabella. This tubercle occurs alone in many genera otherwise smooth, as in Asaphidae and is hence of functional importance. The author gives a list of the species with median eye tubercles.

Article VI. The cephalic suture lines of Cryptolithus.

The author gives figures in the text of *Dionide formosa* Barr., *D. atra* Salter and *Cryptolithus tessellatus* Green. The author concludes that these genera are not Hypo-

RUEDEMANN (Rudolf)—Continued

peria, but belong among the families of Opisthoparia. The figure of *Cryptolithus tessellatus* shows the lateral facial suture and the lateral eye tubercle, also median eye tubercle.

Plate 36 contains a few figures of various genera of Trilobites with median eye tubercle, such as:

Isoteloidea homalonotoidea Walc. *Symphysurus convexus* Cleland. *Basiliscus Kegelensis* Sch. *Symphysurus angustatus* S. & B. *Asaphellus monticola* Rayn. *Asaphus ludibundus* mut. *jexensis* Schm. *Hemigyaspis collicaria* Rayn. *Nileus Armadillo* Dalm. *Ceratopyge forficula* Sars. *Niobe insignis* Liurs. *Barrandia crassa* Barr. *Aeglina umbonata* Illaenus *oriens* M. & S. *Bronteus Haidingeri* Barr.

——— and Clarke (John M.) Catalogue of the type specimens of Palaeozoic Fossils in New York State Museum.

Bull. New York State Museum, No. 65, 1903.

Crustacea, pp. 658-765 and 814.

Classification of the type specimens by geologic formations, pp. 815-847.

Sarle (Clifton J.) A new Eurypterid fauna from the base of the Salina of Western New York.

Bull. New York State Mus., No. 69, 1903, pp. 1087-1108, pls. 6-26.

The author proposed a new genus *Hughmilleria* for a small form, which from its general appearance in many ways suggests the genus *Eurypterus*, but a study of its structure shows it to be closely related to *Pterygotus*.

The author described *Hughmilleria socialis* nov. and var. *robusta* nov. var. A new species of *Eurypterus* is included under the name of *E. pittsfordensis*, which closely resembles *E. lacustris*, approximately of the same size, also in the position and shape of the eyes. The posterior portion of the cephalon flares out in *E. pittsfordensis*, or at least broadens out in a hyperbolic curve, while *E. lacustris* is marked by the nearly parallel sides of the cephalon.

The author also describes *Pterygotus monroensis* nov.

Savage (T. E.) Stratigraphy and Palaeontology of the Alexanderian series in Missouri and Illinois. part one.

Bull. No. 23, State Geol. Sur. Illinois, 1913, 124 pp., with 7 plates.

The author describes *Proetus princeps* n. sp. This rare specimen from the Thebes, Illinois, has a glabella resembling that of *P. determinatus* Foerste, and differs but slightly from the Edgewood species. From the Girardeau limestone, Shumard, Geol. Mo., 1855, p. 198, gives the name of *Proetus depressus* to a species without figure or description. This is not the *P. depressus* Weller, Pal. N. J., vol. 3, p. 249.

The author also describes *Cyphaspis girardeauensis* Shumard. *Acidaspis Halli* Shumard. *Encrinurus deltoideus* Shumard and *Calymmene dubia* n. sp., which resembles *Calymmene platycephala* Foerste.

From the Edgewood series of Illinois the author describes:

Proetus determinatus Foerste, described as *Bathyrus* Foerste in the Bull. Lab. Den. Univ. vol. 1, p. 103, pl. 14, fig. 5, 1885.

Cyphaspis intermedia Weller, and *Metapolychas breviceps* var. *clintonensis* Foerste. *Dalmanites Danai* Meek and Worthen.

The species resembles *D. limulurus* Green, but somewhat larger.

From Chanuahan, Illinois, the author describes *Proetus channahonensis* Weller. It has a more prominent glabella and deeper glabella furrows than *P. determinatus* Foerste.

SAVAGE (T. E.)—Continued

Cyphaspis intermedia Weller, *Metapolichas ferrisi* Weller, and a new species of Ostracoda, *Leperditia illinoisensis*—shell differing from *Leperditia faba*, in being shorter and more nearly circular in outline.

——— Some interesting new species of Arthropods from the Devonian strata of Illinois.

Am. Jour. of Science, vol. 35, 1913, p. 149-152, figures.

The author describes *Lepidocoleus Illinoisensis* n. sp. a barnacle from the Clear Creek of Union County Oriskany chert and a new trilobite *Dalmanites palaceus*. This shovel form closely resembles *D. tridentiferus* Shumard, but the anterior extension is short and concave with margin entire instead of having that extension prolonged into a three-lobed process.

——— Alexandrian Rocks of Northeastern Illinois and Eastern Wisconsin.

Bull. Geol. Soc. Am., vol. 27, 1916, pp. 305-344, pls. 15-17.

Eurypterus pumilus nov.

Schlüter (Clemens). Neuere Arbeiten über die ältesten Devon Ablagerungen des Hartz.

Verhandl. des Naturhist. Vereinus der preuss. Rheinl. und Westfalens, vol. 35, Jahrg. 4, Folge V, Bd. p. 330.

Gives a list of Fossil Crustaceae.

Schmidt (Friedrich). Physikalische Section.

Sitzungsb. d. niederrhein Gesellschaft, in Bonn, 1881.

The author describes *Cryphaeus limbatus*, p. 77, and *C. acutifrons* nov., p. 144, and *C. rotundifrons* Emm.

Richter refers the last two species to *Cryphaeus rotundifrons* from the Eurypterus beds of Oesel, and compared them with those of North America.

——— Ueber die neue Merostomenform *Stylonurus Simonsoni* aus dem Obersilur von Rootzkiüll auf Oesel.

Bull. Acad. Imp. Sci. de St. Petersburg. ser. 5, vol. 20, No. 3, p. 199.

——— Revision der Ostbaltischen Silurischen Trilobiten. Abtheilung V, Asaphiden Lieferung 1.

Mem. Acad. St. Petersburg, 8th ser., vol. 6, No. 11, 1898.

Gen. Asaphus Brong. emend. Ang.

Asaphus expansus Dalm. and var. *lepidura* Nieszk., *A. raniceps* Dalm., *A. Broggeri* n. sp., *A. pachyophthalmus* n. sp., *A. platyurus* Ang., *A. Kozłowski* Lawr., *A. Eichwaldi* n. sp., *A. cornutus* Pander, *A. laevissimus* n. sp., *A. latus* Pander, *A. delphinus* Lawr., *A. ornatus* Pomp., *A. devexus* Eichw., *A. Nieszkowski* n. sp. Mut. *Itferensis* Mut. *Jezewensis* Mut. *Kegelensis*, *Asaphus Stacyi* n. sp.

Subgen. Onchometopus Schmidt.

Onchometopus Folborthi n. sp.

Subgen. Ptychopyge Angelin.

Ptychopyge angustifrons Dalm., *P. excavato-zonata* Ang. and var. *truncata* Nieszk., *P. limbata* Ang. ? *P. Lacrozi* n. sp., *P. Kuckersiana* n. sp., *P. globifrons* Eichw., *P. tecticaudata* Steinh.

Gen. Isotelus Dekay.

Isotelus remigium Eichw., *I. platyrhachis* Steinh., *I. robustus* Rom.

SCHMIDT (Friedrich)—Continued

Gen. Niobe Angelin.

Niobe laeviceps Dalm., *N. frontalis* Dalm.

Megalaspis planilimbata Ang., *M. limbata* Boeck, *M. polyphemus* Brogg., *M. Kolenkoi* n. sp., *M. Mickwitzi* n. sp., *M. hyorhina* Herz. v. Leucht., *M. gibba* n. sp., *M. Lazzerovi* n. sp., *M. longicauda* Herz. v., Leucht. (mit *M. gigas* Ang.), *Meglaspis extenuata* Wahlb., *M. acticauda* Ang., *M. heros* Dalm.

Gen. Nileus Dalman.

Nileus Armadillo Dalm.

——— Revision der Ostbaltischen Silurischen Trilobiten. Abtheilung V. Asaphiden Lieferung II.

Mem. Acad. St. Petersburg, 8th ser., vol. 12, No. 8, 1901, 12 plates.

Asaphus Broggeri n. sp., *A. expansus* Dalm., *A. lepidurus* Nieszk., *A. raniceps* Dalm. var. *Lamanskii* and var. *acuminata* Boeck.

Asaphus pachyophthalmus n. sp. var. *minor* and var. *major*, *A. Eichvaldi* n. sp. var. *Knyrkoi*, *A. delphinus* Lawr., *A. cornutus* Pand. and var. *Holmi*, *A. Kozvaleskii* Lawr., *A. platyrus* Ang., *A. laevissimus* n. sp. and var. *laticauda*, *A. latus* Pand. and var. *Plautini*, *A. devexus* Eichw., *A. ornatus* Pomp., *A. ludibundus* Torq. mut. *Itferensis* mut. *javensis* mut. *Kegelensis*.

Onchometopus Volborthi n. sp.

Gen. Isotelus Dekay.

Isotelus remigium Eichw., *I. platyrhachis* Steinh., *I. robustus* F. Rom., *I. Stacyi* n. sp.

Gen. Niobe Angelin.

Niobe laeviceps Dalm., *N. Lindstromi* n. sp., *N. frontalis* Dalm.

——— Communication before the Section of Geology and Mineralogy. Oct. 19, 1902, announcing the discovery of *Eurypterus simonsoni*.

Comptes rendus des Sci. in Travaux de la Soc. Imp. de Nat. de St. Petersburg, vol. 33, livr. 1, No. 6, 1902, pp 202-3, in Russian.

——— Ueber die neue Merostomenform *Stylonorhis simonsoni* aus dem Odersilur von Rootzkiill auf Oese.

Bull. Acad. Imp. de Sci. St. Petersburg, vol. 20, No. 3, ser. V, 1904, pp. 99-105, plate.

——— Revision der Ostbaltischen Silurischen Trilobiten. Abtheilung V. Asaphiden Lieferung III.

Mem. Acad. St. Petersburg, 8th ser., vol. 14, No. 10, 1904, 8 plates.

Gen. Ptychopyge Angelin.

Subgen. Pseudasaphus.

Pseudasaphus globifrons Eichw., *P. ? Mickwitzi* n. sp., *P. tecticaudatus* Steinh. and var. *praecurrens*.

Subgen. Basilicus Salter.

Basilicus Lazzerovi n. sp., *B. kuckersianus* n. sp., *B. keyelensis* n. sp.

Subgen. Ptychopyge sens. str.

Ptychopyge angustifrons Dalm. and var. *gladiifera*, *P. truncata* Nieszk. and var. *Broggeri*, *P. cincta* Brogg., *P. Plautini* n. sp., *P. Hohrmanni* n. sp., *P. Knyrkoi* n. sp., *P. Pahleni* nov.

Gen. Ogygia Brongniart auct.

Ogygia dilatata Brunn var. *Pauderi* n. var. and var. *Plautini*.

Gen. Nileus Dalman.

Nileus Armadillo Dalm.

SCHMIDT (Friedrich)—Continued

—— Revision der Ostbaltischen Silurischen Trilobiten. Abtheilung V, Asaphiden Lieferung IV.

Mem. Acad. St. Petersburg, 8th ser., vol. 19, No. 10, 1906, 8 plates.

Megalaspis planilimbata Ang. and var. *Leuchtenbergi* Lam., *M. limbata* Boeck and var. *elongata*, *M. Lazae* n. sp., *M. polyphemus* Brögg. aff. and var. *Tornquisti* var. *minor* var. *Lamanskii* and var. *Knyrkoi*, *M. hyorhina* Leucht. also var. *Kolenkoi*, *Mickwitzi* and *Stacyi*.

Megalaspis Pogrebowi Lam., *M. Knyrkoi* n. sp., *M. gibba* n. sp., *M. acuticauda* n. sp. also var. *typica*, *obtusa*, *triangularis* and *Lamanskii*.

Megalaspis extenuata Dalm., *M. heros* Dalm., *M. centaurus* Dalm. and var. *rudis*, *M. Lazowzei* n. sp.

—— Revision der Ostbaltischen Silurischen Trilobiten.

Memoires Acad. Imp. des Science de St. Petersburg, vol. xx, No. 8, 1907.

Phacops elliptifrons Esm., *P. Dozningiae* Murch. *Pterygomotopus*.

Phacops sclerops Dalm., *P. trigonocephala* F. S., *P. Panderi* F. S., *P. exilis* Eichw., *P. laevigata* F. S., *P. Kuckersina* F. S., *Kegelesensis* F. S., *P. Nieszkowskii* F. S.

Subgenus Chasmops. *Phacops ingraca* F. S., *P. nasuta* F. S., *P. praecurrens* F. S., *P. Odeni* Eichw., *P. Odini* var. *itferensis* F. S., *P. marginata* F. S., *P. bucculenta* Sjogr., *P. W'rangeli* F. S., *P. brevispina* F. S., *P. mutica* F. S., *P. Wenjukowi* F. S., *P. maxima* F. S., *P. Wesenbergensis* F. S., *P. Eichwaldi* F. S.

Cheirurus ornatus Dalm., *C. ingricus* F. S., *C. exsul* Beyr., *C. macrophthalmus* Kut., *C. gladiator* Eichw., *C. spinulosus* Nieszk., *C. cf. glaber* Ang.

Subgenus Crytomotopus. *Cheirurus primigenus* var. *Lamanskii* Ang., *C. clavifrons* Dalm., *C. affinis* Ang., *C. Plautini* F. S., *C. aries* Eichw., *C. Pseudohemicranium*.

Subgenus *Sphaerexocoryphe* *cranium* Kut., *S. Hubneri* F. S., *S. cf. granulata* Ang.

Subgenus *Pseudosphaerexochus* *hemicranium* Kut., *P. conformis* Ang., *P. Pahnshi* F. S., *P. Roemeri* F. S.

Subgenus *Nieszkowskia* *tumida* Ang., *N. variolaris* Linrs., *N. cephaloceros* Nieszk.

Sphaerexochus angustifrons Ang. *Deiphon Forbesi* Barr.

Amphion Fischeri Eichw., *Diaphanomotopus Volborthi* F. S.

Crotalurus Barrandeii Volb.

Cybele bellatula Dalm., also var. *Wohrmanni* F. S., *C. Panderi* F. S., *C. Revaliensis* F. S., *C. rex* Nieszk., *C. Grewingkii* F. S., *C. coronata* F. S., *C. Worthi* Eichw., *C. affinis* F. S., *C. Kutorgae* F. S., *C. brevicauda* Ang.

Encrinurus obtusus cf. Ang., *E. punctatus* Wahlb., *E. multiseigmatatus* Portl., *E. Seebachi* F. S.

Acidaspis Marklini Ang., *A. Kuckersiana* F. S. and var. *Mickwitzi* F. S. *Lichidae* subgen. *Arges* *Lichas wesenbergensis* F. S.

Subgen. *Leiolichas*. *Lichas illaenoides* Nieszk.

Subgen. *Platymetopus*. *Lichas lineatus* Ang., *L. dalecarlicus* Ang., *L. Holmi* F. S.

Subgen. *Metopias*. *Lichas celorhin* Ang., *L. verrucosus* Eichw., *L. pachyrhinus* Dalm., *L. var. longerostrata* F. S., *L. platyrhinus* F. S., *L. Hubneri* Eichw., *L. Kuckersiana* F. S.

Subgen. *Hoploichas*. *Lichas tricuspidatus* Beyr. and var. *longispina* L. *Plautini* F. S., *L. furcifer* F. S., *L. conicotuberculatus* Nieszk.

Subgen. *Conolochas*. *Lichas triconicus* Dam., *L. aequilobus* Steinh., *L. schmidtii* Dam.

Subgen. *Ceratolichas*. *Lichas inexpectatus* F. S.

Subgen. *Homolichas*. *Lichas depressus* Ang., *L. Pahleni* F. S., *L. deflexus* Sjogr., *L. Eichwaldi* Nieszk., *L. angustus* Beyr.

SCHMIDT (Friedrich)—Continued

Subgen. Oncholichas. *Lichas ornatus* Ang., *L. gotlandicus* Ang.

Subgen. Platylichas. *Lichas St. Mathiae*, *L. margaritifer* Nieszk., *L. docens* F. S., *L. cicatricosus* Lov., *L. hamatus* F. S., *L. laxatus* McCoy.

Illanus Esmarcki Schl., *I. sphaericus* Holm., *I. jezensis* Holm., *I. laticlavus* Eichw., *I. chiron* Holm., *I. intermedius* Holm., *I. crassicauda* Waldh., *I. tauricornis* Kut., *I. ariensis* Holm., *I. sulcifrons* Holm., *I. Plautini* Holm., *I. rezaliensis* Holm., *I. Dalmani* Vollb., *I. oculus* Holm., *I. chudleighensis* Holm., *I. sinuatus* Holm., *I. Schmidtii* Nieszk., *I. ladogensis* Holm., *I. oblongatus* Ang., *I. Roemeri* Vollb., *I. angustifrons* Holm., *I. atavus* Eichw., *I. Maskei* Holm., *I. centrotus* Dalm., *I. Linnarssoni* Holm., *I. proles* Holm., *I. livonicus* Holm., *I. triquetrus* Vollb., *I. caccus* Holm.

Subgen. Bumastus. *Ilacnus barriensis* Murch., *I. sulcatus* Lindstr.

Calymmendiae: *Calymmene tuberculata* Brunn., *C. intermedia* Linstr., *C. frontosa* Lindstr., *C. laevigata* F. S., *C. conspicua* F. S., *C. spectabilis* Ang., *C. Stacyi* F. S.

Subgen. Pharostoma. *Calymmene pedibola* F. Rom., *C. Nieszkowskii* F. S., *C. denticulata* Eichw.

Subgen. Ptychometopus. *Calymmene Volborthi* F. S.

Bronteidae: *Bronteus laticauda* Wahl., *B. estonicus* F. S., *B. Marklini* Ang.

Proetidae: *Proetus concinnus* var. *Osiliensis* F. S., *P. verrucosus* Lindstr., *P. conspersus* Ang., *P. planedorsatus* F. S., *P. cf. distans* Lindstr., *P. ramisulcatus* Nieszk., *P. Kertelensis* F. S., *P. Wesenbergensis* F. S., *P. Höhrmanni* F. S.

Cyphaspis elegantula Lov., *C. planifrons* Eichw.

Menocephalus minutus Nieszk.

Harpedidae: *Harpides Plautini* F. S.

Harpes Spasskii Eichw., *H. Wegelini* Ang.

Trinuclerus seticornis His.

Ampyx Volborthi F. S., *A. Linnarssoni* F. S., *A. costatus* Sars? *A. rostrata* Sars, *A. Kuyrkoi* F. S., *A. dubius* F. S.

Remopleurides nanus Leucht., *R. var. elongata* F. S., *R. emarginatus* Törnq.

Dikellocephalidae: *Ipatoccephalus serratus* Sars and Boeck; also var. *dubius* Mob. *Agnostus glabratus* var. *ingrica* F. S.

Asaphus Broggeri F. S., *A. expansus* Dalm., *A. lepidurus* Nieszk., *A. raniceps* Dalm., *A. pachyophthalmus* F. S., *A. Eickvaldi* F. S., *A. delphinus* Lawr., *A. cornutus* Pander, *A. var. Holmi* F. S., *A. Kozłowski* Lawr., *A. platyurus* Ang., *A. laevissimus* F. S.; also var. *laticauda* F. S., *A. latus* Pander and var. *Plautini* F. S., *A. depressus* Eichw., *A. ornatus* Pomp., *A. lepidus* Törnq., *Nieszkowskii* F. S. and var. *jezensis* F. S., *A. Kegelsensis* F. S.

Onchometopus Volborthi F. S.

Isotelus remigium Eichw., *I. platyrhachis* Stein, *I. robustus* F. Rom., *I. Stacyi* F. S.

Niobe laeviceps Dalm., *N. Lindstromi* F. S., *frontalis* Dalm., *N. Volborthi* F. S.

Ptychopyge Ang. subgen. *Pseudasaphus* F. S., *P. globifrons* Eichw., *P. tecticaudatus* Steinh.

Subgen. Basilius Salt., *B. Lazzerovi* F. S., *B. Kuckersianus* F. S., *B. Kegelsensis* F. S.

Ptychopyge angustifrons Dalm., *P. var. gladiifera* F. S., *P. truncata* Nieszk. and var. *Broggeri*, *P. cincta* Brogg., *P. Plautini* F. S., *P. limbata* Ang., *P. Kuyrkoi* F. S., *P. Pahleni* F. S.

Ogygia dilatata var. *Panderi* F. S., *P. dilatata* var. *Plautini* F. S.

Nileus Armadillo Dalm.

Megalaspis planilimbata Ang., *M. limbata* Boeck, *M. Lazzeri* F. S., *M. polyphemus* Br. aff. and var. *minor* F. S., *M. Lamanskii* F. S., *M. Kuyrkoi* F. S., *M. hyorhinus* Leucht and var. *Kolenkoi* F. S., *M. Mickewitzii* F. S., *M. Stacyi* F. S., *M. Pogrebowi* F. S., *M. Kuyrkoi* F. S., *M. gibba* F. S., *M. acuticauda* Ang., *M. extenuata* Dalm., *M. heros* Dalm., *M. centaurus* Dalm. and var. *rudis* Ang., *M. Lazzerovi* F. S.

SCHMIDT (Friedrich)—Continued

Megalaspides Schmidtii Lam.

Olenellus Mickwitzii F. S.

Cheirurus (Cyrtometopus) primigenus Ang., *Cybele bellatula* var. *Wohrmanni*.

Lichas Pahleni F. S., *L. cicatricosus* Loven, *Niobe Volborthi* F. S.

Cyrtometopus Pseudohemicranium Nieszk. *Encrinurus Seebachi* F. S.

Calymene frontosa Lindstr., *C. laevigata* and *conspicua* F. S.

Asaphus lepidus Törnq. and *A. Nieszkowski* F. S. *Niobe laeviceps* Dalm.

Megalaspis hyorkina Leucht.

Schmidt (W. E.) *Cryphaeus* in dem Siegener Schichten.

Zeitschr. d. Deutsch. Geol. Ges., vol. 59, 1907.

The author describes as *Cryphaeus attavus* a species with a head and a short, triangular pygidium, which shows a faint development of four pairs of marginal lappets, seen best by the four pairs of pits within the doublure.

Dr. Clarke in his paper on Devonian of Parana, p. 156, remarks: This, certainly, is not a *Cryphaeus*, even phylogenetically, for exceedingly young forms of *Cryphaeus* have sufficiently demonstrated that the ontogeny presents no four-spined stage. The tail is similar in the character of its lappets to those obscure structures in *Proboloides pessulus*, a new genus created by Clarke in the same work.

Schumacher (R.) Ueber Trilobitenreste aus dem Unterkarbon im Ostlichen Teil des Rosbergmassivs in den Südvogesen.

Zeitschr. Deutsch. Geol. Ges., 55, 1903, pp. 432-438, plate 19.

Phillipsia Silesiaca Scupin, *P. Eichwaldi* var. *alsatica* n. var.

Griffithides Frechi Scupin, *G. Damesi* Scupin.

Schuchert (C.) On the Lower Silurian (Trenton) fauna of Baffin Land.

Proc. Natl. Museum, vol. 22, 1900, pp. 143-177, plates 12-14.

Dalmanites (Pterygomotopus) Goodridgi n. sp. *Iliaenus vigilans* H. & W., *I. crassicauda Americanus* Billings. *Isotelus gigas* DeKay. *Ceraurus pleurexanthus* Green.

Scupin (Hans). Die Trilobiten des niederschlesischen Unterearbon.

Zeitschr. Deutsch. Geol. Ges., Jahrg. 1900, pp. 1-20, plate, figs. 1-3, text.

Phillipsia aff. *aequalis* Meyer, *P. longicornis* Kays., *P. gemmulifera* Phill., *P. truncatula* Phill., *P. Silesica* n. sp., *P. Spec.*

Griffithides Damesi n. sp., *G. Frechi* n. sp., *G. depressus* n. sp., *G. claviger* n. sp.

Seemann (Fr.) Beiträge zur Gigantotraken fauna Böhmens.

Beitr. zur. Pal. and Geol. Österr.-Ung. u. d. Orients, Bd. 19, Hft. 1, p. 49, 1906.

Semper (M.) Die Gigantotraken des älteren böhmischen Paläozoium.

Beiträge zur Paläontologie and Geol. Oesterreich-Ungarns u. d. Orients, Bd. 11, 1898, p. 71.

Seward (A. C.) Notes on Fossil Plants from the Witteberg series of the Cape Colony.

Geol. Mag., Decade 5, vol. 6, No. 11, 1909, p. 482.

The author refers the *Hastimima Whitei* to the genus *Eurypterus*, p. 485, as part of a body segment of that genus.

This paper is followed on p. 486 with a note on the genus *Hastimima* from Brazil and the Cape, by Henry Woodward, in which the author compares it with *Eurypterus punctatus* Salter.

Shimer (H. W.) Almost complete specimen of *Strenuella strenua* Billings.

Am. Jour. Science, vol. 23, 1907, pp. 199-201, figure.

In the Amer. Jour. Sci., vol. 23, 1907, p. 319, the author refers *Ptychoparia murren-atus* Shaler and Foerste, Bull. Mus. Zool., vol. 16, plate 2, to *Strenuella strenua* Billings, remarking that it appears that *S. strenua* is quite variable in the shape of the free cheeks and in the ornamentation of the axis.

Shuler (E. W.) New Ordovician Eurypterid.

Am. Jour. Sci., vol. 39, 1915, p. 551.

Stylonurus (Ctenopterus) alveolatus p. 552, fig. in text 1-6, from the Bay sandstone, Walker's Mt., Virginia.

The subgeneric name of *Ctenopterus* was used on account of the long, flattened segments of the endognathite; the lack of serrations on the segments, such as is found in *Eurypterus*; the presence of the long joint, belonging probably to the walking leg or balancer characteristics of *Stylonurus*, and the long, broadened spines or bristles which are especially characteristic of the subgenus *Ctenopterus*.

Siebert (L.) Versteinerungs-führenden Sedimentgeschichte im Glacialdiluvium des Nordwestlichen Sachsens.

Paläontologisches Institut der Univ. Leipzig, 1898, pp. 37-138.

Cambrian: *Eurycare latum* Ang. *Peltura scarabaeoides* Wahl. *Sphaerophthalmus alatus* Boeck.

Silurian: *Asaphus expansus* Dalm. *Cheirurus (Nieszkowskia) variolaris* Lin. *Remopleurides nanus* c. Leucht. *Agnostus glabratus* Ang. *Chasmops conicophthalmus* S. & B. *Beyrichia costata* Lin. *Chasmops macrurus* Sjögren, *C. Wessenbergensis* Schmidt.

***Siemiradski (J. von).** Die Paläozoischen Gebilde Podoliens. (Not seen.)

II Paläontologischer Teil Wien Beitr. Pal. Geol., Ost Ung. 19, 1906, pp. 213-286, Taf. xv-xxi.

Siemiradzki (von Jos.) Die paläozoischen Gebilde Podolens.

Beiträge Z. Pal. and Geol. österr.-Ung. u. s. Orients, Bd. 19, Heft 2, vol. 3, 1906, p. 4.

Six (Achille). Les appendices des Trilobites d'après M. Ch. D. Walcott.

Soc. Geol. du Nord, Ann. xi, 1883-84, pp. 228-236.

Slocum (A. W.) On the Trilobites of the Maquoketa beds of Fayette County, Iowa.

Field Mus. Nat. Hist., No. 171, Geol. Ser., vol. 4, No. 3, pp. 43-83, plates 13-18, 1913.

The author has secured from these beds 20 species of Richmondian Trilobites, 17 of which are here named, 11 of them being new.

The new genus *Cybeloides* is also defined.

The author describes and illustrates the following Crustacea:

Isotelus gigas DeKay, *I. maximus* Locke, with the remark that most of the specimens of *Isotelus* from this locality, which have been referred by other authors to *I. maximus*, are here referred to *Isotelus loewensis* Owen.

Isotelus loewensis Owen. *Megalaspis Beckeri* sp. nov. Compares *M. gonioceras* Meek and *M. extenuata* Angelin.

Nileus vigilans Meek and Worthen. *Bumastus Beckeri* sp. nov. *Thaleops ovata* Conrad. *Amphilichas rhinoceros* sp. nov., *A. clermontensis* sp. nov.

SLOCUM (A. W.)—Continued

Encrinurus pernodosus sp. nov.

Cybeloides gen. nov. This genus differs from *Cybele* Loven, as exhibited in *C. bel-latula* the genotype, in the form of the glabella furrows, and in the genal angles being produced into spines, instead of being rounded.

The author describes *Cybeloides iowensis* sp. nov.

Calymene fayttensis sp. nov., *C. gracilis* sp. nov. *Ceraurus pleurexanthemus* Green, *C. Milleranus* Miller and Gurley, *C. elginensis* sp. nov.

Eccoptychile meekanus S. A. Miller.

Sphaerocoryphe maquokensis sp. nov. *Pterygomelopus Fredricki* sp. nov., *P. larrabeei* sp. nov.

Smith (J. F., Jr.) Canadian Journal, new series, vol. 6, 1861, p. 275.

Triarthrus canadensis nov.

The genal angles of the head are spined.

Smycka (F.) Beiträge zur Kenntniss der Trilobiten fauna in mah-rischen Devon bei Celechovitz.

Acad. des Sci. de l'Empereur Francis Joseph, 1 Bull., Intern. class des Sci. Math. and Nat., pp. 19, plate 1, 1895.

The author gives a list of 60 species, which serves to indicate the Upper Devonian age of the fauna. He gives descriptions of several Trilobites, two of which are new, namely: *Proetus celechovincensis* n. sp. and *P. moravicus* sp. nov.

——— Ueber die Trilobiten des Celechovitzer Devon in Mahren.

Vesmir Prag, 1895, Jahrg. 24, p. 136.

Bronteus intermedius Goldf. *Dechenella Verneuli* Barr.

This species is referred by Richter to *Dechenella* (*Eudechenella*) *rittbergensis* Zimmermann.

Proetus Celechovincensis n. sp., *P. moravicus* n. sp. and *Cyphaspis* sp.

Sobolev (D.) Mittel Devon des Kielec-Sandonir Gebirges.

Mater. Geol. Ross., St. Petersburg, vol. 24, 1909, pp. 41-536, with 5 plates.
Devonian Ostracoda.

Spencer (W. K.) The hypostomaic eyes of Trilobites.

Geol. Mag., Decade 4, vol. 10, 1903, pp. 489-492, with 3 figures.

This is a review of Dr. Lindstrom's paper, "Researches on the Visual Organs of the Trilobites," to show the close correspondence of the maculae with certain sense organs present in the Phyllopod genus *Branchipus*, and also in *Limulus*.

Spriestersbach and Fuchs. Die Fauna der Remscheider Schichten.

Abh. Geol. Landesant., N. F. Heft 58, 1909, pp. 111 and 81, with 11 plates.

Beyrichia embryoniformis n. sp., *B. montana* n. sp. *Entomis* sp. *Cryphaeus* sp. (Dr. Green's genus *Cryphaeus*, 1837.) This generic name was used in 1833 for a genus of Coleoptera, therefore will have to be abandoned.

Stauffer (Clinton R.) The Middle Devonian of Ohio.

Geol. Sur. Ohio, Fourth Series, Bull. No. 10, 1909.

The author describes as new *Proetus Welleri* from Venice, Ohio. The species was referred by Rud. Richter to *Dechenella* (aff. ? *Eudechenella Welleri*).

Stepanov (P.) Fauna aus der Umgebung des Balchas Sees.

Verh. Russ. Mineral. Ges., Ser. 2, vol. 46, 1908, pp. 161-198, plates 1 and 2.
Leperditia shearsbii Chapman.

Steusloff (A.) Ostrakoden aus Diluvialgeschieben von Neu-Brandenburg.

Zeitschr. Deutsch. Geo. Ges., Jahrg., 1894, pp. 775-787, pl. 53.

Cambrian: *Bythocypris polita* n. sp.

Ordovician: *Primitia excelsa* n. sp., *P. reticulata* n. sp., *P. concinna* n. sp., *Beyrichia antiqua* n. sp., *B. digitata* var. *separata* n. var., *Entomis latisulcata* n. sp., *E. impressa* n. sp., *E. umbonata* n. sp.

Brandschiefer: *Strepula elliptica* n. sp. *Entomis sigma* Kr.

Macroura Kalk: *Beyrichia Krausei* n. sp., *B. rostrata* Kr. *Entomis oblonga* n. sp.

Untersilurischer Beyrichien Kalk: *Primitia angulata* n. sp., *P. curva* n. sp. *Strepula lineata* var. *granulosa* n. var. *S. constans* n. sp.

Borkholmer Kalk: *Leperditia praelonga* n. sp. *Primitia cuneata* n. sp., *P. canaliculata* n. sp., *P. elongata* var. *obliqua* n. var., *P. rugosa* n. sp.

Leperditia Kalk: *Leperditia Krausei* n. sp., *L. ? Kiesowii* n. sp. *Isochilina frequens* n. sp. (*Leperditia brachynotus* F. Schm.) ? *P. elongata* var. *semicircularis* n. var.

Fraglichen Alters: *Strepula signata* n. sp., *S. lineata* var. *separata* 111 Obersilur.

Obersilurischen Beyrichien Kalkes: *Primitia praerupta* n. sp., *P. punctata* n. sp. *Octonaria Bollii* n. sp.

Steusloff (A.) Sedimentärgeschiebe von Neubrandenburg.

Zeitschr. d. Deutsch. Geo. Ges., vol. 44, 1892.

Stschegloff (H.) Sur les Trilobites en général et en particulier sur ceux de Zarskoe-Selo.

Jour. fur neue Entdeckungen in der Phys. Chem. Natur. und Technologie, St. Petersburg, Nos. 1, 2, 1827, p. 227, plate vii, fig. 9.

The author proposed the new genus *Deucalion* for such species as *Nileus armadillo*, *Illaenus crassicauda*.

Stur (D.) Der Trilobiten Fund des Herrn Kasch in den Kalkmuggeln des Heiligenberger Schachtes bei Pribram.

Verhandl. der K. K. Geol. Reich. Jhg., 1876, pp. 31-32.

Phacops fecundus Barr. also var. *major*.

***Swinerton.** On the classification of Trilobites. (Not seen.)

Geol. Mag., Decade vi, vol. —, 1915, p. 487.

The author states in regard to Beecher's Classification of 1897, that the majority of new Trilobites found since the publication fit into it without difficulty and prove that to a large extent it is conceived on a sound basis. A few, however, do not fit in, and have therefore revealed its weakness.

Taylor (Julius S.) Notice of fragments of Trilobites of gigantic size in the Cabinet of Julius S. Taylor.

Am. Jour. Sci., ser. 2, vol. 6, p. 431, 1848.

Thomas (H. H.) Fossils of the Oxford Museum IV. Notes on some undescribed Trilobites.

Quart. Jour. Geol. Soc., vol. 56, 1900, p. 616, pls. 34-35.

Phacops (Dalmanites) coronatus n. sp. *Phacops (Dalmanites) nobilis* n. sp. and *Olenus Mitchensini* n. sp.

Thomas (Ivor). Neue Beiträge zur Kenntniss der devonischen Fauna Argentinien's.

Zeitschr. Deutsch. Geol. Ges. lxvii, 1905, pp. 233-290, plates xi-xiv.

Homalonotus Kayseri n. sp. *Phacops argentinus* n. sp. *Dalmanites Drevermanni* n. sp., *D.* sp., *D.* sp. and *Beurichia argentina* n. sp.

——— New Devonian fossils from Cornwall.

Geol. Mag., Dec. v, vol. vi, No. 3, 1909, pp. 97-102, plate 3.

Phacops (Trimerocephalus) pentops n. sp.

The species was classed under this subgenus on the size of the angle made by the dorsal furrows bounding the glabella, which in the case of *Trimerocephalus* would be about 50 deg., and *Phacops* 80-90 deg.

——— A note on *Phacops (Trimerocephalus) lacvis* Munster.

Geol. Mag., Dec. v, vol. vi, No. 4, 1909, pp. 167-169.

The author refers the British species *Phacops (Trimerocephalus) lacvis* Salter, Decade xi, pl. ix, figs. 1-5, to Salter's name of *Phacops trinucleus*.

——— Notes on the Trilobite fauna of Devon and Cornwall.

Geol. Mag., Decade v, vol. vi, 1909, pp. 193-204, pl. vii.

Phacops (Trimerocephalus) anophthalmus Frech. *Phacops (Trimerocephalus)* aff. *cryptophthalmus* Emm. as interpreted by Gumbel.

Phacops (Trimerocephalus) tripartitus n. sp. *Proetus dunhevidensis* n. sp. *Dechenella ussheri* n. sp. *Phillipsia minor* H. Woodward.

The name of *Dechenella* was first employed by Kayser for those members of the Proetidae with very tapering and strongly lobed glabella.

——— A new Devonian Trilobite and Lamellibranch from Cornwall.

Geol. Mag., Decade V, vol. 6, p. 537, pl. 3, 1909.

Phacops (Trimerocephalus) pentops sp. nov.

Toll (Edward von). Beiträge zu Kenntniss des Sibischen Cambrium.

Mem. de l'Acad. Imp. des Science de St. Petersburg, viii ser, vol. 8, 1899, No. x, with plates.

Microdiscus lenaicus n. sp., *M. Kocki* n. sp., *Microdiscus* sp.

Agnostus Schmidtii n. sp. *Olenellus* sp. *Agnostus Czekanowski* Schm.

Dorypyge Slatkowskii Schm.

Ptychoparia Czekanowski n. sp., *P. Meglitzkii* n. sp.

Solenopleura ? sibirica Schm.

Bathyriscus Hozvelli Walcott.

Anomocare Pawlowski Schm.

Liostracus Maydelli Schm.

The first part of Baron Toll's important contribution to Cambrian literature refers to the earlier work of Dr. F. Schmidt, in which he places some of these fossils as Devonian, but Toll correctly refers them to the Cambrian. One of these is *Doryphyge Slatkowskii*, described under the genus *Proetus* by Schmidt—the three others are referred to *Anomocare Pawlowski* Schm., *Liostracus Maydelli* Schm., and *Solenopleura sibirica*, described by Schmidt under the genus *Cyphaspis*.

On plate 1 are figured some new species of Trilobites from a new locality.

Two minute species are referred to the genus *Ptychoparia*, which Dr. Mathew, in his review of Toll's paper, remarks might be compared with the *Strenuella* type of *Agraulos*.

The *Agnostus* described as *A. Schmidtii* has an unusual association, if occurring in strata with *Microdiscus*. The *Agnostus*, however, is flatter than the typical species of the *Paradoxides* beds, and Dr. Matthew says it may be an earlier form.

Tornquist (S. L.) On the appendages of Trilobites.

Geol. Mag., London, Decade iv, vol. 3, 1896, p. 142.

On *Parabolina spinulosa* Wahlenb. as figured by Linné, Svenska Vet. Akad. Handl., vol. 20, 1759, showing one pair of antennae at their true place.

Linné says: "Fig. 1 is one of the clearest specimens I ever saw among so many thousand. Most remarkable in this specimen are the antennae in front, which I never saw in any other example, and which clearly proves the fossil to belong to the insects."

——— Linné on the appendages of Trilobites.

Geol. Mag., London, Decade iv, vol. 3, 1896, pp. 567-569.

The author does not conform Beecher's suggestion that Linné's figure may be interpreted as the thickened border between the facial sutures, but considers them as true antennae.

——— Fördrojdä Paleontologiska meddelanden.

Geol. Fören. Förhandl., No. 238, Bd. 27, Häft. 27, 1906.

Chirurus Clasonii n. sp.

Turner (H.) Trilobites and their modern representatives.

Seventh Ann. Report Proc. Crypyden Micr. Club, 1878, pp. 42-46.

Compares the Trilobites with the living *Limulus*.

Tullberg (Sven Axel). Skånes Graptoliter.

Sveriges Geol. Undersökning, Ser. C, n. 55, 1883.

On p. 18 the author describes a new *Calymmene dilatata* nov. and *C. trinucleina* Linsr. msc. nov.

The species was afterwards fully described and illustrated by Dr. E. Olin, Meddelande från Lund. Geol. Fätkubb Ser. B, No. 1, 1906, p. 56, plate 2, figs. 10, 11 and 12.

Pompeckj in his reclassification of the Calymmenidae, places this species under the group *Synhomalonotus*, section *Calymmene Tristani*. *Calymmene (Synhomalonotus) dilatatus* Tullbg.

Twenhofel (W. H.) The Anticosti Island faunas.

Geol. Sur. Canada Mus. Bull., No. 3, Geol. series, No. 19, October 30, 1914.

The author describes as new *Triarthrus Becki* var. *macastyensis*.

This variety is like *T. Becki* except the facial sutures are slightly more sinuous, and in front they diverge from the axis instead of converging as in *T. Beckii*.

Triarthrus jemtlandicus Lindström has a similar facial suture, though otherwise different.

Ulrich (Edward O.) Ostracoda.

Text Book of Palaeontology (Zittel's) translated by C. R. Eastman, London and New York, 1900, pp. 642-648.

——— and Bassler (Ray S.) New American Palaeozoic Ostracoda. Notes and descriptions of Upper Carboniferous genera and species.

Proc. Natl. Mus., vol. 30, 1906, pp. 149-164, pl. 40.

Paraparchites n. gen., *P. humerosus* n. sp. *Beyrichia ? radiata* J. & K., *B. ? emaciata* n. sp. *Beyrichiella gregaria* n. sp., *B. bolliiformis* n. sp., *B. bolliiformis tumida* n. var. *Kirbya pinguis* n. sp., *K. centronota* n. sp.

ULRICH (E. O.) and BASSLER (Ray S.)—Continued

Cythere ? *Haworthi* n. sp. *Bairdia Beedei* n. sp. and var. *adrupta*.

Cypridina subovata n. sp.

The genus *Paraparchites* is closely related to and probably derived from *Aparchites*. In the latter the ventral edges of the valves meet without appreciable or, at any rate, constant overlap, and it is this difference that is chiefly relied on to distinguish the two genera.

The authors refer the Ordovician species *Aparchites elliptica* Ulrich, to this genus.

——— and Bassler (Ray S.) New American Paleozoic Ostracoda. Preliminary revision of the *Beyrichiidae* with descriptions of new genera.

Proc. U. S. National Museum, vol. xxxv, 1909, pp. 277-340, plates 37-44.

New genera: *Scofieldia*, *Treposella*, *Hollina*, *Kirbyina*, *Jonesina*.

New subgenus: *Steusloffia*.

New species: *Beyrichia moodeyi*, *B. waldronensis*, *Kloedenia centricornis*, *K. fimbriata*, *K. marginalis*, *K. praenunfia*, *K. punctillosa*, *K. retifera*.

New name *Beyrichia granulifera*.

The authors divide the family into 21 genera, as follows:

Beyrichia McCoy emended.

Ordovician species: *Beyrichia* (*Steusloffia*) *acuta*, (*B. erratica* var. *acuta* Krause), *B. (Steusloffia) antiqua*, (*B. antiqua* Steusloff), *B. granulifera* new name (*Bollia granulosa* Krause), *B. (Steusloffia) Linnarssoni* (*Strepula Linnarssoni* Krause), *B. (Steusloffia) signata* (*B. signata* Krause). *Beyrichia tumida* (*Ctenobolbina tumida* Ulrich), *B. v-scripta* (*Bollia v-scripta* Krause).

Silurian species: *Beyrichia admixta* Jones and Holl., *B. aquilatera* Hall, *B. Baucri* Reuter, *B. Baucri tripartita* Reuter, *B. (Steusloffia) beyrichiodides* (*Strepula beyrichiodides* J. & H.), *B. bolliana* Reuter, *B. Bronni* Reuter, *B. Buchiana* Jones, *B. Buchiana angustata* Reuter, *B. Buchiana incisa* Reuter, *B. Buchiana lata* Reuter, *B. Buchiana nutans* Kiesow, *B. clavata* Kolmodin, *B. Damesi* Krause, *B. diffusa* Jones, *B. dubia* Reuter, *B. grandis* Kolm., *B. granulosa* Hall, *B. interrupta* (*Bollia interrupta* Jones), *B. Jonesii* Boll., *B. Kloedeni* McCoy, *B. Kloedeni acadica* J., *B. Kloedeni antiquata* J., *B. Kloedeni bicuspis* Kiesow., *B. Kloedeni granulata* J., *B. Kloedeni infecta* J., *B. Kloedeni intermedia* Jones, *B. Kloedeni intermedia* sub. var. *subspissa* Jones and Holl., *B. Kloedeni nuda* Jones, *B. Kloedeni protiberans* Boll., *B. Kloedeni subtorosa* J., *B. Kloedeni torosa* Jones, *B. Kloedeni verruculosa* Jones, *B. Kochii* Boll, *B. lata* Hall, *B. laevis* Kiesow, *B. Lindstromi* Kiesow, *B. MacCoyiana* Jones, *B. MacCoyiana sulcata* Reuter, *B. Moodeyi* n. sp., *B. muldensis* Chapman, *B. nodulosa* Boll, *B. nodulosa expansa* (*B. Lindstromi* var. *expansa* Kiesow), *B. Noetlingi* Reuter, *B. Noetlingi conjuncta* Reuter, *B. plagosa* Jones, *B. plicata* (*Entomis plicata* Krause), *B. pustulosa* Hall, *B. reticulata* (*Strepula reticulata* (limbata in text) Krause), *B. Reuteri* Krause, *B. salteriana* Jones, *B. scanensis* Kolmodin, *B. (Steusloffia) simplex* (*Strepula simplex* Krause), *B. spinulosa* Boll, *B. Steusloffii* Krause, *B. trilobata* (*Entomis trilobata* Krause), *B. tuberculata* (*Battus tuberculatus* Kloeden), *B. tuberculata bigibbosa* Reuter, *B. tuberculata foliosa* Jones, *B. tuberculata spicata* Jones, *B. tuberculata Kockiana* Reuter, *B. umbonata* (*B. bolliana umbonata* Reuter), *B. waldronensis* n. sp.

Devonian species: *Beyrichia aurita* Richter, *B. devonica* J. & W., *B. new species* (*B. Kloedeni* var. Jones).

Of the 225 named species and varieties, varying in time from the Cambrian to the Permian, and referred to the genus *Beyrichia*, only 73 species and varieties listed above are referred to the genus.

The authors places under Group *Beyrichia Kloedeni*:

Beyrichia Kloedeni, *B. MacCoyiana*, *B. Bollinana*, *B. Kockii*, *B. tuberculata-Kockiana*, *B. Moodeyi* and *B. Lindstromi*.

ULRICH (E. O.) and BASSLER (Ray S.)—Continued

The valves are usually short, semi-elliptical in outline, and sharply lobed.

Group *Beyrichia Buchiana*:

The anterior and median lobes are joined, but the anterior lobe is thinner and the ventral connection proportionally thicker than usual, the combination giving to the united lobes a striking similarity to the horseshoe ridge in the *B. ungula* section of Bollia.

Group *Beyrichia tuberculata*:

This section comprises a number of species, in which the anterior and posterior lobes are broken up by minor furrows—the posterior lobe into 2, the anterior lobe into from 2 to 6 or 7 node-like parts. *Beyrichia Buchiano-tuberculata* Reuter, would represent about the simplest type, and *B. pustulosa* Hall and *B. Noetlingi* Reuter the most complex.

Group *Beyrichia Salteriana*:

The species of this group are not as large as those of the preceding groups and differ in the fullness of their lobes and proportionate narrowness of the furrows.

Group *Beyrichia clavata*:

The small group includes *B. Jonesii* Boll, and possibly *B. umbonata* Reuter.

Subgenus *Steusloffia*, new.Group *Beyrichia Linnarssoni*:

This group includes *B. antiqua*, *B. acuta*, *B. simplex*, *B. Linnarssoni*, *B. signata*, *B. beyrichiodes* and probably *B. erratica* Krause.

Group *Beyrichia interrupta*:

The illustrations given by the authors show possible derivation of the *B. interrupta* group from Eurychilina, and its relations to *Beyrichia clavata* group and to *Steusloffia*.

The authors place under *Kloedenia* the following species:

Kloedenia apiculata Jones, *K. Barretti* (*Beyrichia Barretti* Wel.), *K. centicornis* n. sp., *K. concinna* (*Beyrichia concinna* J. & H.), *K. fimbriata* n. sp., *K. granulata* (*Beyrichia granulata* Hall), *K. initialis* (*Beyrichia initialis* Ulrich), *K. intermedia* (*B. intermedia* J. & H.), *K. intermedia marginata* J. & H., *K. jerseyensis* (*Beyrichia jerseyensis* Weller), *K. Kummeli* (*Beyrichia Kummeli* Weller), *K. manliensis* (*Beyrichia manliensis* Wel.), *K. manliensis deckerensis* (*Beyrichia deckerensis* Weller), *K. marginalis* n. sp., *K. montaguensis* (*Beyrichia montaguensis* Wel.), *K. nearpassi* (*Beyrichia nearpassi* Weller), *K. oculina* (*Beyrichia oculina* Hall), *K. parasitica* (*Beyrichia parasitica* Hall), *K. praenuntia* n. sp., *K. punctillosa* n. sp., *K. retifera* n. sp., *K. scotica* (*Beyrichia Kloedeni* var. *scotica* J. & H.), *K. simplex* Jones, *K. Smocki* (*Beyrichia Smocki* Weller), *K. sussexensis* (*B. sussexensis* Weller), *K. tuberculata* (*Beyrichia tuberculata* Salter), *K. wallpackensis* (*Beyrichia wallpackensis* Weller), *K. Wilckensianna* (*Beyrichia Wilckensianna* Jones), *K. Wilckensianna plicata* (*Beyrichia Wilckensianna plicata* Jones).

Of the above species *K. initialis* and *K. praenuntia* are Middle Ordovician and *K. simplex* late Devonian. All the others Silurian.

The genus *Kyammodos* Jones is closely allied, distinguished chiefly by the much greater inequality of its valves, the thick ventral edge of the right overlapping the smaller left valve. There are some peculiar differences in lobation also.

Tetradella Genotype *T. quadrilobata* H. & W.

List of Ordovician species:

Tetradella ? *affinis* (*Beyrichia affinis* Jones), *T. bohemia* (*Beyrichia bohemia* Barr. MSS. Jones), *T. bussacensis* (*B. bussacensis* Jones), *T. carinata* (*B. carinata* Krause), *T. complicata* (*B. complicata* Salter), *T. complicata decorata* (*Beyrichia complicata* var. *decorata* Jones), *T. ? digitata* (*Beyrichia digitata* Krause), *T. ? digitata separata* (*Beyrichia digitata* var. *separata* Steusloff), *T. (Kiesowia) dissecta* (*Beyrichia dissecta* Krause), *T. ? erratica* (*Beyrichia erratica* Krause), *T. harpa* (*B. harpa* Krause), *T. ?*

ULRICH (E. O.) and BASSLER (Ray S.)—Continued

lacunata (*Beyrichia lacunata* J. & H.), *T. (Kiesowia) mamillosa* (*Beyrichia mamillosa* Krause), *T. marchica* (*B. marchica* Krause), *T. marchica angustata* (*B. marchica* var. *angustata* Krause), *T. marchica lata* (*B. marchica* var. *lata* Krause), *T. palmata* (*Beyrichia palmata* Krause), *T. quadrilirata* (*Beyrichia quadrilirata* H. & W.), *T. (Kiesowia) radians* (*B. radians* Krause), *T. ribeiriana* (*B. ribeiriana* Jones), *T. simplex* (*T. quadrilirata* var. *simplex* Ulrich), *T. subquadrans* Ulrich.

Ceratopsis Genotype *Beyrichia Chambersi* Miller.

The genus includes *C. robusta* Ulrich, *C. intermedia* Ulrich, *C. oculifera* Hall, all Upper Ordovician species, and *C. hastata* (*Beyrichia hastata* Barr.)

Stenobolina Genotype *Beyrichia ciliata* Emmons.

Group of *Ctenobolina ciliata*.

Ordovician species:

Ctenobolina alata Ulrich, *C. bispinosa* Ulrich, *C. ciliata* Emmons, *C. curta* (*C. ciliata* var. *curta* Ulrich), *C. Duryi* (*Beyrichia Duryi* Miller), *C. emaciata* (*C. ciliata* var. *emaciata* Ulrich), *C. Guilleri* (*B. Guilleri* Tormelin), *C. Hammelli* (*B. Hammelli* Miller and Faber), *C. obliqua* Ulrich, *C. oblonga* (*Entomis oblonga* Steusloff).

Silurian species:

Ctenobolina granosa Ulrich, *C. punctata* Ulrich.

Devonian species:

Ctenobolina papillosa Ulrich.

Group of *Ctenobolina subcrassa*.

Ordovician species:

Ctenobolina crassa Ulrich, *C. fulcrata* Ulrich, *C. impressa* (*Entomis impressa* Steusloff), *C. major* (*Bollia major* Krause), *C. minor* (*Bollia minor* Krause), *C. subcrassa* Ulrich, *C. umbonata* (*Entomis umbonata* Steusloff).

Silurian species:

Ctenobolina auricularis (*Bollia auricularis* Jones).

Devonian species:

Ctenobolina minima Ulrich.

Mississippian species:

Ctenobolina loculata Ulrich.

Drepanella. Genotype *D. crassinoda* Ulrich.

Ordovician species:

Drepanella ampla Ulrich, *D. bigeneris* Ulrich, *D. crassinoda nitida* Ulrich, *D. elongata* Ulrich, *D. macra* Ulrich, *D. Richardsoni* (*Beyrichia Richardsoni* Miller), *D. Richardsoni canadensis* Ulrich.

This wholly American genus is remarkable for the extreme variability of the nodes within the central area of the valves.

Scofieldia new genus. Genotype *Drepanella bilateralis* Ulrich.

Treposella nov. gen. genotype *Beyrichia Lyoni* Ulrich. This genus proposed for a link in the evolution of Hollina from Beyrichia.

Hollina new genus. Genotype *Ctenobolina insolens* Ulrich.

Devonian species:

Hollinia antespinosa Ulrich, *H. armata* Ulrich, *H. cavimarginata* Ulrich, *H. informis* Ulrich, *H. spiculosa* Ulrich.

All these species were described as species of *Ctenobolina* by Ulrich.

Carboniferous species:

Hollinia granifera (*Bollia granifera* Ulrich), *H. radiata* (*Beyrichia radiata* J. & K.), variety *cestriensis* Ulrich, *H. longispina* (*Beyrichia longispina* J. & K.), *H. emaciata* (*Beyrichia ? emaciata* U. & B.).

The authors include under this genus *Beyrichia Kolmodini* and *B. tricollina* Ulrich.

ULRICH (E. O.) and BASSLER (Ray S.)—Continued

Kloedenella new genus. Genotype *Kloedenia Pennsylvanica* Jones.

The genus includes some 8 to 10 species, two of them probably only varieties ranging in time from the Clinton to Middle Devonian. The British species *Beyrichia ? bicaesa* J. & K., may be included.

This genus is divisible into two sections:

In the first, the genotype, the posterior and median furrows are shorter than in section number 2, and the anterior furrow either wanting or more or less well-developed.

In the 2nd section, of which *Beyrichia Halli* Jones, is a good example, the posterior and anterior furrows are long, subequal and extending nearly or quite across the valve.

Kirkbyina new genus. Genotype *Beyrichiella ? reticosa* Jones and Kirkby.

Kirkbyina resembles *Primitia*, but is readily distinguished by its overlapping valves and thicker anterior end.

Beyrichiella J. & K. Genotype *B. cristata* J. & K.

The shell is relatively longer than that of *Kirkbyina*, and its larger valve is not the right, as in that genus, but the left.

The authors include under *Beyrichiella* *B. cristata* and *Kirkbyina annectens* the type of *Synaphe* Jones and Kirkby, also *Ulrichia confluens* Ulrich.

The generic term *Synaphe* was used by Huebner, therefore preoccupied.

Beyrichiopsis J. & K. Genotype, *B. fimbriata* J. & K.

Other typical species are the Carboniferous species:

Beyrichiopsis cornuta, *B. subdentata*, *B. fortis*, *B. granulata* and *B. simplex*, all described by Jones and Kirkby.

Jonesina new genus. Genotype *Beyrichia festigiata* J. & K.

The following species are referred to *Jonesina* *Beyrichia arcuata* Bean: *B. Bradyana* J. & K., *B. craterigera* Brady MS. J. & K., *B. fodicata* J. & K. Carboniferous species, also *Beyrichiella bolliiformis* var. *tumida* and *B. gregaria* Ulrich and Bassler.

————— Ostracoda.

Geol. Sur. Maryland Lower Devonian, Baltimore, 1913, pp. 513-542, pls. 97-98.

The following species are described:

Leperditia altoides Weller, 1903, *L. elongata* Weller, 1903, *L. gigantea* Weller, 1903.

Aparchites Gordoni n. sp. *Primitia postturgida* n. sp., *P. ? cumberlandica* n. sp., *P. ? concentrica* n. sp.

Primitiella variolata n. sp. *Ulrichia aequalis* n. sp. *Strepula irregularis* Jones and Holl, 1886. *Halliella seminulum* var. *longa* n. var., *H. ? triplicata* n. sp. *Aechmina cuspidata* Jones and Holl, 1869.

Mesomphalus n. gen.

Carapace of medium size, 1 mm. to 2½ mm. in length, equivalved; valve moderately convex, oblong, subquadrate in outline, with a small ventral pit lying between two rather small rounded nodes; edges of valves rather thick, usually concealed by a flat border, which overhangs it; ventral pouch somewhat elongated, sausage-shaped, occupying nearly the full length of the ventral side.

Type *Mesomphalus hartleyi* n. sp., *M. submarginata* n. sp.

Ctenobolbina denticula n. sp., *C. dubia* n. sp. *Bollia americana* n. sp., *B. curta* n. sp., *B. irregularis* n. sp., *B. jugalis* n. sp., *B. ungula* Jones, 1891. *Kloedenia centricornis* Ulrich and Bassler, 1908, *K. fimbriata* U. & B., 1908, *K. nearpassi* Weller, 1903, *K. Kümmeli* Weller, 1903, *K. sussexensis* Weller, 1903, *K. Barretti* Weller, 1903, *K. Pennsylvanica* Jones, 1889, *K. Clarkei* Jones, 1890, and var. *paupera* U. & B., 1908, *K. turgida* U. & B., 1908, for *K. Pennsylvanica* Jones, in part, 1889, figs. 8 and 9, not figs. 5 and 7; also var. *ventrosa* U. & B. for *K. Pennsylvanica* Jones, 1889, figs. 7 a-b, not figs. 5, 6, 8 and 9.

ULRICH (E. O.) and BASSLER (Ray S.)—Continued

Thilipsura multipunctata n. sp. *Octonaria angulata* n. sp., *O. inequalis* n. sp., *O. simplex* Krause, 1891.

Craterellina n. gen.

The most obvious characteristic of the genus is the presence of a crater-like depression, bordered by a more or less distinctly elevated rim, occupying the anterior one-third or one-half of each valve.

Craterellina robusta n. sp., *C. oblonga* n. sp.

Bythocypris punctatolata var. *arctatum* n. var. *Pontocypris arcuata* n. sp., *P. marvii* var. *breviata* Jones, 1889, and *Pachydomella longula* n. sp.

Van Ingen (Gilbert). The Silurian fauna near Batesville, Arkansas.

School of Mines Quart., vol. 23, 1901, No. 1.

The author refers to certain plates which were not issued with the publication.

The author remarks on the family Acidaspidae Barr. (used for the xii family, without a family name), that this term is used in preference to Odontopleuridae of Burmeister (used by this author for a family name), which latter name had more recently been suggested by Etheridge and Mitchell in 1897, inasmuch as the genus *Acidaspis* Murch. (January, 1839,) and Emmrich's name *Odontopleura* (1839) is of later date. There was no date of publication given on Emmrich's *De. Trib. Dissertates*.

The author refers to Murchison's *Acidaspis*, on p. 55, as a similar genus.

The author quotes Barrande, Vogdes and Clarke on the family and gives figures of *Odontopleura ovata*, *Selenopeltis Buchi*, *Ceratocephala prevosti* and *C. Danai*, *Dicranurus humatus* and *Acidaspis Brighti* in the text. The author describes seven species from the Niagaran limestone of St. Clair Springs.

Odontopleura Ortonti Foerste, *O. arkansana* nov. with fig. in text.

Ceratocephala gonita Warder (*depauperata*), *C. nodulata* nov., fig. of head in text, *C. coalescens*, fig. glabella in text.

Acidaspis quinquespinosa Salter MS., fig. 12 head in text.

The unpublished plates of *Acidaspis* Salter and Fletcher (two plates), the second one (figs. 10-12) of *Acidaspis quinquespinosus* nov. of a small head with spined occipital ring, and an entire specimen (fig. 12) with a median node to the occipital ring. Van Inger's figure is more in keeping with Lake's fig., pl. 7, fig. 4.

Acidaspis obsoleta nov., figs. 13 and 14 in text.

Ampyx niagarensis nov., fig. 15 in text, compares *A. parvulus* Forbes, differs in its longer and narrower glabella, and less tumid cheeks.

Proetus corrugatus nov., figs. 16-17 in text, head and tail; *P. subanulatus* nov., fig. 18 in text, tail.

Arges phycenoides Green, *depauperatus*.

The author uses the preoccupied term *Arges* referred by Gurich to *Ceratages*.

Van Ingen places *Lichias Hanoovensensis* Miller and Gurley and *L. Byrncansus* M. & G. as syn. to Green's species.

Arges arkansanus nov., fig. 19 in text, head compares *Lichias Grayi* Fletcher. *Lichias nereus* Hall.

Encrinurus punctatus Wahl., refers *E. ornatus* H. & W., to this.

Dalmanites (Synphoria) ziglans Hall, *D. (Synphoria) arkansanus* nov., figs. 20-22, heads and tail, broad and narrow forms.

These forms differ in the well-marked triangular outline of both cephalon and the frontal glabellar lobe, of the American Ordovician and Silurian species. Their nearest ally appears to be *Phacops Brongniartii* Portlock, which has been referred to the subgenus *Pterygometopus*.

Vogdes (A. W.) Notes on Palaeozoic Crustacea, No. 5. Carboniferous Trilobites from Missouri.

Proc. Cal. Acad. Sci., 2nd ser., vol. 6, 1896, p. 197, fig. in text.

Proctus ? placidus nov.

This species from Chouteau limestone of Sedalia has the lateral lobes of the pygidium smooth, similar to the Silurian species of France named by Rouault *Calymmene Arago* and *C. Salteri*, although it belongs to a different group of the Proetidae, with only nine thorax segments. The head is parabolic in form, genal angles rounded. The eyes are similar in location to those of *Phillipsia Sampsoni* from the same locality. The tail has eight axial joints with indications of two faintly defined segments on the lateral lobes.

—— The genus *Encrinurus*: its history, its species, its proper division in the family of Trilobites.

Trans. San Diego Soc. Nat. Hist., vol. 1, 1907, No. 2, pp. 61-82, plates 1-3.

The author divides the family into two divisions:

Encrinurus. Genotype *E. punctatus* Wahl.

Cryptonymus. Genotype *C. variolaris* Brong.

Although Eichwald used this term in 1825 for certain Asaphidae and Illaenidae, he used the same term in 1840 for such species as *Calymmene punctatus* and *C. variolaris*, which was adopted by Angelin. The term should stand under the strict rule of priority for the second use of the term.

Cryptonymus Eichwald, 1840.

The author uses it for the second species included by Eichwald in 1840. Figures and descriptions of *Encrinurus punctatus* Walh., *E. vigilans* Hall, *E. ornatus* H. & W., *E. Threcheri* Foerste, *E. Trentonensis* Walc., *E. nereus* Hall, *E. Eagani* Miller, *E. Americanus* Vogt., *E. sex-costata* Salt., *E. delitides* Shumard, *E. Barrandei* DeKon., *E. Mitchellii* Foerste, *E. schisticola* Törnq., *E. Seebachi* Schm., *E. multi-segmentatus* Porth., *E. fallax* Reed, as given.

Under the genus *Cryptonymus* the author includes *Cryptonymus variolaris* Brong., *C. expansa* Hasw. Henderson, 1868, refers the free cheeks of *Zethus Paycii* Haswell, to *E. expansus*. *C. obtusus* Ang., *E. varicostatus* Wal., *C. laevis* Ang., *Encrinurus Bozningi* Foerste, *E. tuberculatus* Collie.

Certain species described by Barrande under the genus *Cromus* have been referred by Novak to the genus *Encrinurus* on account of the direction of the facial sutures, which are the same in both genera. They are *Cromus Beaumonti*, *C. Bohemicus*, *C. transient* and *C. intercostatus*. The *Encrinurus Novaki* Frech, has been referred to *Encrinurus Beaumonti* var., *Novaki* by Gornani and Le Regny.

Remarks the name of *Encrinurus punctatus* has often been applied to a common Scandinavian species, first illustrated by Wahlenberg in an advanced publication of his paper in 1818. Petrificata telluris Svecanae, Brunnich's fossil from Bohemia, from a soft yellow limestone, may be the *Cromus Beaumonti* Barr. The author remarks, in his paper, on two very imperfect petrified impressions of this fossil, that it had across the fossil body impressed spotted rings, which marks are sufficient to distinguish them from other species. The size of it seems to vary greatly, as my collection contains one small and one very large back part of this species; each has 18 joints. The only Bohemian Encrinuridae recorded are those described under *Cromus* by Barrande and Novak.

Verneuil (E.) Observations sur la description de quelque Trilobites russes par M. A. de Volborth.

Bull. Soc. Geol. de France, 2nd ser., vol. 5, 1848, p. 384.

Review of Dr. Volborth's paper on the genus *Zethus*.

Wade (A.) On the Llandovery and associated rocks of Northeastern Montgomeryshire.

Quart. Jour. Soc. London, vol. 67, No. 267, 1911, p. 415, plates 33-36.

Notes on the Palæontology of the area 1—Trilobita.

The author describes the following species:

Trinucleus intermedius sp. nov.

Refers *T. concentricus* Hall, Pal. N. Y., vol. 1, p. 249, pl. 65, figs. 4a-4c; also p. 255, pl. 67, figs. 1a-h, to the new species.

Dionide sp.

Ostracoda *Melanella* n. gen.

The author gives the following description of the genus:

Carapace small; equivalves moderately convex, subcircular, rather flattened anteriorly; hinge straight; valves with a small, faintly raised horseshoe ridge confined to the posterior half, enclosing a small semicircular sulcus; edges simple.

The genus is closely allied to *Jonesella* of Ulrich.

Melanella hemidiscus gen. et sp. nov.

Primitiella unicornis Ulrich. *Primitia Ulrichi* Jones, *P. tumidula* Ulrich. *Ctenobolina cf. ciliata* Emmons. *Bolla lata* V. & H. *Kraussella arcuata* Ulrich.

Walcott (Charles D.) Description of new genera and species of fossils from the Middle Cambrian.

Proc. U. S. Natl. Mus., vol. 11, 1888, Washington, 1889, pp. 441-446.

The author includes under the genus *Dorypyge* the following species:

D. richtofeni with *Olenoides nevadensis*, *O. quadriceps*, *O. wasatchensis* and *O. curticei*—a new species which he illustrates on p. 444, fig.; also the new genus *Karlia*, named in honor of Dr. Karl Rominger.

Genotype Karlia minor n. sp.

The author refers *Menocephalus salteri* Rominger, 1887, Proc. Acad. Nat. Sci., pt. 1, p. 16, pl. 1, fig. 6, to a new species: *Karlia stephencensis*.

The *Bathyurus* Rominger, Proc. Acad. Nat. Sci. Phila., pt. 1, pl. 18, fig. 8, is referred to *Bathyriscus (Kootenia) dawsoni* n. sp.

A new genus, *Ogygopsis*, is founded on the species *Ogygia Klotzi* Rominger, it differs from *Ogygia* in having a well-defined ocular ridge, and in the narrow palpebral lobe.

——— Cambrian Fossils, Yellowstone National Park.

Mong. U. S. Geol. Survey, No. 32, part 2, pp. 440-478, plates, 1899.

Agnostus interstrictus White, *A. bidens* H. & W., *A. tumidosus* H. & W.

Ptychoparia Penfieldi n. sp., *P. antiquata* Salt., *P. (Euloma) affinis* Walc., *P. Llanoensis* Walc., *P. sp. Crepicephalus Texanus* Shumard, *P. (Lonchocephalus) hamulus* Owen, *P. (Lonchocephalus) Wisconsinensis* Owen, *P. ? diademata* Hall.

Arionellus levis n. sp. *Arionellus* sp. *Liostracus parvus* n. sp. *Solenopleura Weedi* n. sp. *Zacanthoides* sp. *Bathyriscus* sp.

——— Precambrian fossiliferous formations.

Bull. Geol. Soc. Amer., vol. 10, pp. 189-244, 1899, plates.

Beltin Danai n. gen. et sp.; also figures of *Pterygotus*, *Eurypterus*, *Slimonia* and *Stylonurus* for comparison.

The author refers to the genus *Beltina* certain fragmentary remains of a crustacean collected from the calcareous Greyson shales of Montana, and remarks, as far as can be judged from what we now know of it, is referable to the Merostomata.

WALCOTT (Charles D.)—Continued

——— *Asaphus Emoryi* Hall. Description and figure of in Palaeontologia.

Universalis Fasc. 11, plate 28, 1904.

——— The Cambrian fauna of India.

Proc. Washington Acad. Sci., vol. 7, 1905, pp. 251-256.

Notes on the genus *Redlichia* *Noetlingi* Redlich. *Ptychoparia Richeri* Redlich, *P. Warthi* and *Olenus indicus*.

——— Cambrian faunas of China.

Proc. U. S. Natl. Mus., vol. 29, 1905, pp. 1-106.

Trilobita: *Agnostus Kusanensis* n. sp. *Microdiscus orientalis* n. sp. *Redlichia chinensis* n. sp., *R. finalis* n. sp., *R. nobilis* n. sp. *Redlichia* sp. *Olenoides ? cili* n. sp. *Dorypyge bispinosa* n. sp. *Dorypygella typicalis* n. gen. et sp.

The genus is characterized by the peculiar glabella, narrow frontal margin, and spinose pygidium.

Dorypygella alcon n. sp., *D. alastor* n. sp.

The *Dorypygella typicalis* is a synonym of *Teinistion Lansii* Monke. *Damesella Blackwelderi* n. gen. et sp.

The genus differs from *Dorypyge* in the character of the head, as far as known. The thorax and pygidium are essentially of the same type. The pygidium of *Damesella* is of the type of *Olenoides* and the pleural lobes of the thoracic segments are also of the same type, but the thorax of *Olenoides* has eight segments, and a strong median spine on the axis, while the thorax of *Damesella* has twelve or more segments and without a median spine.

Damesella nov. gen. genotype, *D. Blackwelderi* Walcott.

Damesella bellagranulata n. sp., *D. brevicauda* n. sp., *D. chione* (a syn. of *Stephanocare Richthofeni* Monke), *D. sinensis* Bergeron. *Dicelloccephalus sinensis*.

Agraulos abaris n. sp., *A. abrota* n. sp., *A. acalle* n. sp., *A. agenor* n. sp., *A. dirce* n. sp., *A. dixi* n. sp., *A. dolon* n. sp., *A. dryas* n. sp.

Anomocare alcinoe n. sp., *A. Bergioni* n. sp., *A. bianos* n. sp., *A. biston* n. sp., *A. ? butes* n. sp., *A. ? daulis* n. sp., *A. daunus* n. sp., *A. decelus* n. sp., *A. tatian* n. sp., *A. temenus* n. sp.

Anomocarella chinensis n. gen. et sp.

The genus differs from *Anomocare* in the absence of glabella furrows and the presence of a relatively narrow, flattened frontal rim.

Anomocarella baucis n. sp., *A. albion*, *A. carne* n. sp.

Arionellus agonius n. sp., *A. ajax* n. sp., *A. alala* n. sp.

Menocephalus acerius n. sp., *M. agave* nov., *M. Felenus* nov. n. sp., *M. ? depressus* n. sp.

Pagodia lotos n. gen. et sp.

This genus differs from *Dolichometopus* in the narrowing instead of widening of the glabella in front; in the presence of small instead of large eye-lobes, short instead of long postero-lateral limbs, and obscure glabellar furrows.

Pagodia bia n. sp., *P. dolon* n. sp., *P. macedo* n. sp., *P. lotos* n. sp.

Pterocephalus asiatica n. sp., *P. busiris* n. sp.

Ptychaspis acamus n. sp., *P. cacus* n. sp., *P. cadmus* n. sp., *P. calchas* n. sp., *P. callisto* n. sp., *P. calyce* n. sp., *P. campe* n. sp., *P. ceto* n. sp., *P. sp.*

Ptychoparia aelis n. sp., *P. ? batia* n. sp., *P. ? bromus* n. sp., *P. ceus* (*Liostracina Krausci* n. sp., Monke), *P. constricta* n. sp., *P. dryope* n. sp., *P. granulosa* n. sp., *P. impar* n. sp.; also var. *P. ligea* n. sp., *P. mantoensis* n. sp., *P. tellus* n. sp., *P. tenes*, *P. sp.*, *P. titiana* n. sp., *P. theano* n. sp., *P. tolus* n. sp.

WALCOTT (Charles D.)—Continued

Ptychoparia (Liostracus) toxus n. sp., *P. (Liostracus) trogus* n. sp., *P. (Liostracus) tutia* n. sp.

Proampyx subgen. of *Ptychoparia* (name used by Frech, 1902, *Lethaea Geol.*, 1 Theil *Leathaea* Pal. 11, p. 66, for *Anomocare acuminatum* Ang.).

Ptychoparia (Proampyx) burea n. sp.

Shantungia spinifera n. gen. et sp. *Solenopleura alderus* n. sp., *S. acantha* n. sp., *S. acidalia* n. sp., *S. agno* n. sp., *S. belus* n. sp., *S. heroe* n. sp.

Dikelocephalus ? baubo n. sp., *D. ? brizo* n. sp. *Crepicephalus damia* n. sp., *C. magnus* n. sp.

Dolichometopus alceste n. sp., *D. deois* n. sp., *D. derceto* n. sp., *D. dirce* n. sp.

Illeaururus canens n. sp., *I. ceres* n. sp., *I. dictys* n. sp.

Ostracoda: *Bradoria Bergeroni* n. sp., *B. enyo* n. sp., *B. eris* n. sp., *B. fragilis* n. sp., *B. sterope* n. sp., *B. Woodi* n. sp.

——— Cambrian faunas of China.

Proc. U. S. Natl. Museum, vol. 30, 1906, pp. 563-595.

Blackwelderia n. gen. *Dorypyge Richthofeni laevis* n. var. *Blackwelderia cilix* Walc. Genotype *B. sinensis* Bergeron.

Agraulos armatus n. sp., *A. nitida* n. sp., *A. obscura* n. sp., *A. regularis* n. sp., *A. uta* n. sp., *A. vicina* n. sp., *A. ? capax* n. sp., *A. ? melie* n. sp.

Anomocare Bigsbyi n. sp., *A. erioptia* n. sp., *A. flava* n. sp., *A. sp. ?*

Anomocarella contigua n. sp., *A. irma* n. sp.

Ptychaspis bella n. sp.

Ptychoparia comus n. sp., *inflata* n. sp., *P. Lilia* n. sp., *P. nereis* n. sp., *P. undata* n. sp., *P. vesta* n. sp., *P. sp. ? P. ? Maia* n. sp., *P. (Liostracus) intermedia* n. sp., *P. (L.) subrugosa* n. sp.

Solenopleura pauperata n. sp.

Dolichometopus hyrie n. sp.

——— Cambrian Geology and Palaeontology, No. 5. Cambrian sections of the Cordilleran area.

Smithsonian Miscellaneous Collections, vol. 53, Dec. 10th, 1908.

The names of some new species are given, but without descriptions.

——— Mount Stephen rocks and fossils.

Canadian Alpine Journal, vol. 1, No. 2, pp. 232-248, 4 plates, 1908.

The author illustrates *Olenellus Gilberti* Meek. *Anomolocaris ? Whiteavesi* n. sp., *A. Canadensis* Whiteaves, *A. ? acutangulus* n. sp. *Oryctocephalus Reynoldsi* Reed. *Bathyriscus occidentalis* Matt., *B. ornatus* Walc. *Karlia stephensis* Walc., *Ptychoparia cordillerae* Rominger, *P. palliseri* n. sp. *Agnostus montis* Matt. *Burlingia Hectori* Walc. *Dorypge (Kootenia) Dawsoni* Walc. *Zacanthoides spinosus* Walc. *Bathyriscus rotundatus* Rominger. *Neolenus serratus* Rominger. *Ogygopsis Klotzi* Rominger.

No description of the species was given.

——— Cambrian Geology and Palaeontology, No. 2. Cambrian Trilobites.

Smithsonian Misc. Collections, No. 1805, vol. 53, 1908.

Burlingidae: This family includes the genera *Burlingia* and *Schmalensecia*. The genotype of the genus is *Burlingia Hectori* Walcot. The facial sutures and free cheeks relate *Burlingia* to some forms of the Cheiruridae, while the pygidium of *Burlingia* recalls the simple pygidium of *Paradoxides*, and the pygidium of *Schmalensecia* recalls that of *Amphion*.

WALCOTT (Charles D.)—Continued

Albertella n. genus, Genotype *A. Helena* n. sp.

The genus should be compared with the genus *Zacanthoides*. The cephalons of the two genera are generically the same. The thoracic segments are the same type, but the third or fourth segment of the thorax of *Albertella* is extended into long pleural spines, and the thorax has seven instead of nine segments as in *Zacanthoides*. The pygidium has one pair of spines instead of many spines, as in *Zacanthoides*.

Albertella Bosworthi n. sp.

Oryctocare new genus, genotype *O. Geikiei* n. sp.

The cranium of the cephalon of this genus is much like that of *Oryctocephalus*, but the thorax and pygidium are unlike. The pleurae are of the *Olenus* type, while the pygidium is broad and of the *Bathyriscus* type.

Zacanthoides idahoensis n. sp. *Neolenus inflatus* n. sp., *N. intermedius* n. sp., *N. intermedius pugio* n. variety, *M. superbus* n. sp.

Bathyriscus ornatus n. sp.

—— Middle Cambrian Merostomata.

Smithsonian Mis. Coll., vol. 57, No. 2, Washington, 1911.

In this paper two genera, *Sidneyia* and *Amiella*, are described.

Sidneyia inexpectans Walc. *Amiella ornata* Walc. *Neolenus serratus* Rominger. *Beltius Danai* Walc.

The new genera are placed in a new sub-order *Limulava* of the order *Eurypterida*. *Sidneyia* with its four pairs of cephalo-thoracic appendages and simple antennae approaches the *Trilobita*, which has a similar scheme of cephalic appendages.

—— Cambrian Geology and Palaeontology, No. 6. *Olenellus* and other genera of the *Mesonacidae*.

Smithsonian Misc. Collections, vol. 53, No. 6, 1910, pp. 231-422, Pls. 22.

The author under the family *Mesonacidae* places:

1. *Nevadia* n. gen. genotype *N. Hetsi* n. sp.

In the type of this genus the posterior 11 segments have only the axial lobe and a spinose continuation on each side. The spinose extensions of the posterior segments are proportionally much rounder and smaller than those of the anterior 17 segments. The pygidium is small without pleural lobes and transverse furrows.

2. *Mesonacis*: This form is essentially the same as *Elliptocephala*, but it has an enlarged third segment in the adult, and a strong spine on the fifteenth segment.

The species referred to *Mesonacis* are *M. vermontana* Hall, *M. Mickwitzi* Schmidt, and *M. Torrelli* Moberg.

Elliptocephala Emmons, genotype *E. asaphoides* Emmons.

In the genus the posterior five segments are more highly developed than the primitive segments of *Nevadia*, but not as much so as the segments anterior to them.

Callavia Matthew, genotype *Olenellus (Holmia) bröggeri* Walcott.

This genus was proposed by Matthew, *Am. Geol.*, vol. 19, p. 397, 1897, for *O. bröggeri* and *O. callavii* Lapw., on account of the glabella differing from that of *Olenellus (Holmia) Kjerulfii*.

Callavia has a trace of the constricted pleurae of the posterior portion of the thorax in the two last segments. The broad thorax of *Callavia* with the falcate extensions of the pleurae are unlike the narrow thorax of *Holmia* with its spinose pleural extensions.

The glabella of *Callavia* is narrower and more primitive, and its intergenal spine is less primitive. The pleural furrow of *Callavia* is narrow and oblique, like that of *Paradoxides*, while the pleural furrow of *Holmia* and *Wanneria* is broad and straight.

The segments of *Callavia* appear to be nearer to *Elliptocephala*, than to those of *Holmia*.

WALCOTT (Charles D.)—Continued

The following species are referred to the genus: *Callavia bicensis* Walc., *C. bröggeri* Walc., *C. burri* Walc., *C. callævi* Lapw., *C. cortlandi* Raw. Mss., *C. crosbyi* Walc. and *C. nevadensis* Walc.

Holmia Matthew genotype *Paradoxides Kjerulfi* Linnarsson, 1871.

The species referred to Holmia are *H. kjerulfi*, *H. lundgreni* and *H. rosei* Walc., the only American species.

Wanneria new genus. Genotype *W. Walcottanus* Wanner.

This genus has a uniform series of thoracic segments, with pleurae terminating in broad falcate extensions beyond the body line, without the spinose ends as in Holmia.

The species referred to Wanneria are: *W. Walcottanus* Wanner, *W. gracile* Walc. and *W. Halli* Walcott.

Paedeumias n. gen. Genotype *P. transitans* Walcott.

The distinctive characters of the genus are in the presence of the rudimentary segments and pygidium.

Olenellus Hall. Genotype *O. Thompsoni* Hall.

The author remarks that *Olenellus Thompsoni* passes through a *Holmia* and *Paedeumias* stage before becoming a true *Olenellus*.

The American species are *Olenellus Thompsoni* Hall and variety *O. crassimarginatus* Walcott, *O. gilberti* Meek, *O. fremonti* Walc., *O. canadensis* Walc., *O. claytoni* Walc., *O. argenteus* Walc., *O. walcotti* S. & F.

The European species are *O. gigas* Peach, *O. lapworthi* Peach, *O. reticulatus* Peach and *Olenellus* n. sp. undt.

All these species have telsonated pygidia and may be classed under the family name of *Olenellidae*.

Peachella new genus. Genotype *P. iddingsi* Walcott.

The genus is only known by the head, which has blunt, tumid genal spines; elongated, narrow glabella; small eyes and marked convexity.

Olenelloides Peach. Genotype *O. armatus* Peach.

This genus is clearly defined by its large cephalon and primitive thorax and pygidium. The author remarks it is essentially a larval form of *Olenellus*. The author diagrammatically represents these Lower Cambrian genera under the family of *Mesonacidae*. Left-hand branch Nevadia, Callavia, Holmia, Wanneria,—*Paradoxides*. Right-hand branch Nevadia, Mesonacis, Elliptocephala, Paedeumias, Olenellus, Peachella—*Olenelloides*.

——— Cambrian Geology and Palaeontology, No. 7. Cambro-Ordovician boundary in British Columbia, with description of Fossils.

Smithsonian Mis. Coll., vol. 57, No. 7, 1912.

The author describes *Certopyge canadensis* n. sp.

This species differs from *C. forficula* Sars in the greater length of the frontal limb of the cranium, longer palebral lobes and narrower fixed cheeks, etc.

——— Cambrian Geology and Palaeontology—2. No. 6. Middle Cambrian Brachiopoda, Malacostraca Trilobita and Merostoma, with plates 24 to 34.

Smithsonian Misc. Coll., vol. 57, No. 6, 1912.

Under the class Malacostraca, the author describes the following species:

Hymenocaris circularis n. sp., *H. obliqua* n. sp., *H. ovalis* n. sp., *H. parva* n. sp., *H. perfecta* n. sp., *H. vermicauda*.

Trilobita: *Neolenus serratus* Rominger. *Ptychoparia cordillerae* Rominger. *Marella* n. gen., *M. spendens* n. sp.

WALCOTT (Charles D.)—Continued

Merostomata: *Sidneyia inexpectans* Walc.

Habelia n. gen., *H. optata* n. sp. Emeraldella n. gen., *E. brocki* n. sp., *E. micrura* n. sp. Molaria n. gen., *M. spinifera* n. sp.

Family undetermined. Nathorstia n. gen., *N. transitans* n. sp.

The specific name transitans to this species was given on account of its suggesting a transition between Merostome-like form, such as Molaria spinifera and the trilobites.

Class Crustacea: Order Anostraca—Calman Opabinidae, new family. Opabinia n. gen., *O. regalis* n. sp., *O. media* n. sp. Leancoilia n. gen., *L. superlata* n. sp. Yohoia n. gen., *Y. tenuis* n. sp., *Y. plena* n. sp. Bidentia n. gen., *B. difficilis* n. sp.

Order Notostraca—Calman Naraoidae n. fam. Naraia n. gen., *N. compacta* n. sp. Burgessidae new fam. Burgessia n. gen., *B. bella* n. sp.

Genus Anomalocaris Whiteaves, *A. gigantea* n. sp.

Waptidae: Waptia n. gen., *W. fieldensis* n. sp.

Hurdia n. gen., *H. victoria* n. sp., *H. triangulata* n. sp.

Tuzoia n. gen., *T. retifera* n. sp.

Odaraia n. gen., *O. alata* n. sp. Fieldia n. gen., *F. lanceolata* n. sp.

Carnarvonina n. gen., *C. venosa* n. sp.

Mollisonia n. gen., *M. symmetrica* n. sp., *M. gracilis* n. sp., *M. rara* n. sp.

Tontoia n. gen., *T. kwaguntensis* n. sp.

——— Cambrian Geology and Palaeontology—2, No. 8. The Sardinian Cambrian genus Olenopsis in America.

Smithsonian Misc. Coll., vol. 57, No. 8, 1912, with plate 36.

The author describes and figures *Olenopsis zoppi* Meneghini, *O. agnesensis* n. sp., *O. americanus* n. sp., *O. rodnyi* n. sp.

Dr. Bornemann distinguishes Olenopsis from Olenus, on account of its having a small, rounded tail shield, with unsegmented axis; by the particularly semicircular outline of the cephalon; the conic, nearly smooth, glabella, and 14 or 15 body segments.

——— Cambrian Geology and Palaeontology—2, No. 9. New York Potsdam, Hoyt Fauna, with plates 37-49.

Smithsonian Misc. Collection, vol. 57, No. 9, 1912.

Crustacea:

Ptychoparia minuta Bradley, *P. matheri* n. sp. *Conocephalina whitehallensis* n. sp. *Pagodia seelyi* n. sp. *Agraulos saratogensis* Walc. This species was described as *Bathyrus armatus* Billings (Walcott, 32 Ann. Rep. N. Y. State Mus., p. 131) and as *Ptychoparia (A.) saratogensis* Walcott (Bull. No. 30, U. S. Geol. Sur., p. 21). *Lonchocephalus calciferus* Walcott, previously described under the genus Conocephalites and Ptychoparia.

The species is closely related to *Lonchocephalus wisconsensis* Owen. It differs in having a relatively shorter frontal limb and longer palpebral lobes.

Ptychaspis speciosus Walcott.

Dicelloccephalus Hartti Walcott. This was the *Conocephalites hartti* Walc. (32 Ann. Rep. N. Y. State Mus., p. 130).

The species differs from *Dicelloccephalus minnesotensis* in details, but it appears to come within the limits of the genus.

Dicelloccephalus tribulis n. sp. allied to *D. misa* Hall.

The author also describes and illustrates several tracks of crustaceans under Owen's gen. Protichnites. The author remarks that the particular trilobite that left tracks on the beaches of Potsdam sandstone time were undoubtedly species of the genus Dicelloccephalus.

WALCOTT (Charles D.)—Continued

The author does not consider *Climactichnites* as the trail of a trilobite.

He describes *Protichnites septemnotatus* Owen and *P. Logananus* Marsh.

The author remarks that many of the impressions made by *Protichnites* tracks were trifid, and made by a crustacean having legs terminating in a joint that had three strong, narrow terminal spines.

On plate 45, the author illustrates *Neolenus serratus* from Burgess Pass, in which figure 4 shows the trifid arrangement of the short, strong spines of the terminal joint of the cephalic legs.

——— Cambrian Geology and Palaeontology—2, No. 11. New Lower Cambrian subfauna.

Smithsonian Misc. Coll., vol. 57, No. 11, 1913.

The author describes from Robson Peak District the following new species of Crustacea:

Holmia macer n. sp. The species resembles *Holmia Kjerulfi*, but differs in details of the head and thorax.

Wanneria occidentis n. sp. The species differs from *Olenellus Gilberti* in its small, short, palpebral lobe and strong marginal rim; also in the presence of an occipital spine.

Callavia eucharis n. sp. The species has 23 segments in the thorax.

Callavia perfecta n. sp. This species has 17 thoracic segments. It differs from *C. crosbyi* in having a more tapering glabella, smaller palpebral lobes, and in the absence of a strong occipital spine.

Olenellus Truemanii n. sp. This species differs from *O. Thompsoni* in having shorter palpebral lobes and eyes, and smaller and shorter plural lobes of the third thoracic segment.

——— The Cambrian faunas of China.

Carnegie Inst., vol. 3, Aug. 1, 1913, 375 pp. and 29 plates.

The Trilobites are described and illustrated on pp. 99-228, pls. 1-24. Genus *Agnostus* Brongniart.

Agnostus chinensis Dames, very much like *Agnostus Pic Aoraghi*, 1902, p. 5, pl. 1, f. 28. *A. douvillei* Bergeron. The author places *A. koerferi* Monke, 1903, as a syn., *A. kushanensis* Walcott, *A. parvifrons latelimatus* Lorenz, *A. sp. undt.*

Genus *Microdiscus* Emmons.

Microdiscus orientalis Walcott. The author remarks that the head and the occipital spine are much like those of *M. convexus* Walc. The transverse furrow of the glabella recall those of *M. speciosus* Ford.

Genus *Redlichia* Cossmann, 1902, to replace *Hoeferia* Redlich, 1901.

The author places the *Olenellus Forresti* Foord, Geol. Mag., Dec. 3, vol. 7, 1890, p. 99, pl. 4, figs. 2, 2a-b, under this genus.

Redlichia chinensis Walcott, differs slightly from the type. *R. noettingi*, Redlich, 1901.

R. finalis Walcott, *R. nobilis* Walc., *R. sp. undt.* three species.

Genus *Albertella* Walcott, 1908.

Albertella pacifica Walcott.

The author compares the pygidium of this species with *A. basworthyi* Walc. and *Paradoxides desideratus* Barrande.

The genus *Dorypyge* Dames, 1883.

The author does not include *Olenoides* Walc., under the genus *Dorypyge*, remarking that it differs in the glabella expanding toward the front, while that of *Dorypyge*

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contracts in front of the pits in the dorsal furrow; also that the pleural lobes of the pygidium of *Olenoides* have broad, shallow furrows, with sharp, narrow ridges separating them; while those of *Dorypyge* have narrow furrows, with broad, rounded ridges between them. Type *D. richthofeni* Dames, 1883.

Dorypyge bispinosa Walc., *D. richthofeni* Dames, *D. richthofeni laevis* Walc.

Genus *Teinistion* Monk, 1903.

The genus is characterized by the peculiar glabella, narrow frontal margin and spinose pygidium. Type *T. lansi* Monke.

Teinistion alcon Walc., *T. lansi* Monke, *T. sodeni* Monke, *T. typicalis* Walcott, described under the genus *Dorypygella* by Walcott, 1905.

Genus *Stephanocare* Monke, 1903, syn. *Damesella* Chione Walcott, 1905.

Stephanocare Monkei Walcott, *S. richthofeni* Monke, syn., *D. chione* Walc., *S. sinensis* Bergeron, *S.* sp. undt.

Genus *Blackwelderia* Walcott, 1906.

The genus differs from *Teinistion* in the character of the associated free cheeks and pygidia, and the frontal limb of the cephalon; from *Dorypyge* in the form of the glabella and free cheeks. The thoracic segments are alike in the two genera, and the pygidia are of the same type.

Blackwelderia alastor Walc., described under *Dorypygella* in 1905, *B. cilix* Walc., described under *Olenoides* ? in 1905, *B. sinensis* Bergeron described under *Calymmene* ? in 1899.

Genus *Damesella* Walcott, 1905. Type *D. blackwelderi* Walc.

The author remarks that in *Damesella* and *Stephanocare* the facial suture cuts the posterior lateral margin outside of the genal angle, so as to leave the genal angle on the fixed cheeks, and at the same time the spine, corresponding to the genal spine in other genera of the order *Proparia*, on the free check, so Beecher's classification should be modified in relation to the exceptions made in these genera.

Damesella bellagranulata Walc., *D. blackwelderi* Walc., *D. brevicaudata* Walc., *D.* sp. undt.

Genus *Drepanura* Bergeron, 1899, Genotype *D. premesnili* Berg.

Drepanura ketteleri Monke, *D. premesnili* Bergeron. *Ptychoparia* Corda, 1847.

In this memoir the genus is restricted to species having the characteristic of *Ptychoparia striata* Emmerich.

Ptychoparia axilis Walc., *P. granosa* Walc., *P. impar* Walc. and var., *P. kochibei* Walc., *P. ligea* Walc., *P. lilia* Walc., *P. tolus*, *P. typus* Dames.

Subgenus *Ptychoparia* (Emmerichella) Walcott, 1911.

Genotype *Ptychoparia theano* Walc.

The subgenus differs from the following genera:

1. *Ptychoparia* in its smooth glabella and larger palpebral lobe.
2. *Liostracus* in having an arched or nearly flat frontal limb and rim and more convex cranium.
3. *Conocephalina* in its smoother glabella and wider fixed cheeks.
4. *Anomocare* in its smoother glabella and distinct palpebral ridge, and proportionately shorter eye-lobes and glabella.

The author described under this subgenus the following species:

Ptychoparia (Emmerichella) *bromus* Walc., *P. (E.) constricta* Walc., *P. (E.) eriopia* Walc., *P. (E.) mantoensis*, *P. (E.) theano* Walcott.

Genus *Liostracus* Angelin, 1854. Genotype *L. aculeatus*.

Two species which the author classes under the subgenus *Emmerichella*—*mantoensis* and *constricta*—approach most nearly to the genus *Liostracus*.

Genus *Conocephalina* Brögger, 1886. Genotype *C. ornatus* Brögger, 1877.

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The genus occupies an intermediate position between *Dikelocephalus* and *Ptychoparia*, characterized by its elongated palpebral lobes, narrow free cheeks and elongated glabella, narrowing more or less slightly towards the broadly rounded front.

The Chinese species are: *Conocephalina vesta* Walc., *C. belus* Walc., *C. dryope* Walc., *C. maia* Walc. and *C. sp.* undt.

Genus *Crepicephalus*, Owen, 1852. Genotype *C. loxensis* Owen.

Crepicephalus damia Walc. This species, which is nearly related to *C. loxensis*, differs by the form of the frontal limb and rim of the glabella and other details.

C. convexus Walc. and *C. magnus* Walc.

Genus *Lonchocephalus* Owen, 1852. Genotype *L. hamulus* Owen.

The author refers the *Ptychoparia tellus* Walc., 1905, to this genus.

Genus *Liostracina* Monke, 1903. Genotype *L. krausei* Monke.

Genus *Proampyx* Frech, 1902. Genotype *Anomocare acuminatum* Ang.

Walcott remarks that Dr. Frech appears to have overlooked the fact that the spine of the genus *Ampyx* is a spinose extension of the front of the glabella, while the nasute projection of the frontal rim of *Anomocare acuminatum* is from an entirely different division of the head.

Proampyx burea Walc.

Genus *Pterocephalus* Roemer, 1852. Genotype *P. sancti-sabae* Roemer.

The author describes *Pterocephalus asiaticus* Walc., *P. busiris* Walc. and *P. liches* all from fragments of the head and tails.

Genus *Shantungia* Walcott, 1905. Genotype *S. spiuifera* Walc.

The genus is characterized by the large palpebral lobes, nearly smooth truncato-conical glabella, and the long, spinose extension of the front, which is unlike that of *Ampyx*, as the latter proceeds from the glabella; while the spine of *Shantungia* is from the frontal rim, in the same manner as that of *Proampyx acuminatum* Ang., but differs in the character of the glabella and palpebral lobes.

The only species described is that of the type.

Genus *Inouyia* Walcott, 1911.

The species referred to this genus have a swollen, tumid frontal limb; small palpebral lobes; a convex subrectangular glabella; strong dorsal furrows about the glabella, and marked glabellar furrows.

Genotype *Agraulos Capax* Walc., 1906. In addition to the type the author describes *Inouyia abaris* Walc., *I. ? acalle* Walc., *I. ? armata* Walc., *I. divi* Walc., *I. ? inflata* Walc., *I. melie* Walc., *I. ? regularis* Walc., *I. thisbe* Walc. and *I. titiana*.

Genus *Agraulos* Corda, 1847.

The author refigures the type of the genus and describes the following:

Agraulos abrota Walc., *A. dirce* Walc., *A. dolou* Walc., *A. dryas* Walc., *A. nitida* Walc., *A. obscura* Walc., *A. sorge* Walc., *A. uta* Walc. and *A. vicina* Walc.

Genus *Pagodia* Walcott, 1905. Genotype *P. lotos* Walc.

The author remarks that the genus differs from *Dolichometopus* and from the type in the narrowing instead of widening of the glabella in front, in the presence of small instead of large eye-lobes, short instead of long postero-lateral limbs and obscure glabella furrows.

The species referred to this genus are *Pagodia bia*, *P. dolou*, *P. lotos* and *P. macedo* Walcott.

Genus *Lisania* Walcott, 1911. Genotype *Anomocarella ? burea* Walc.

The species referred to the genus are all small, represented by cranidia and associated free cheeks and pygidia.

Lisania agonius Walc., *L. ajax* Walc., *L. alala* Walc., *L. belemus*, *L. burea* Walc. and *L. cf. burea* Walc.

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Genus *Solenopleura* Angelin, 1854.

Walcott figures pl. 17, figs. 12, *Solenopleura holometopa* Angelin for comparison, and describes as new the following species:

Solenopleura agno Walc., *S. berce* Walc., *S. chalon* Walc., *S. intermedia* Walc., *S. pauperata* Walc., *S. sp. undt.*

Genus *Chuangia* Walcott, 1911. Genotype *Ptychoparia batia* Walc.

The genus proposed for a group of Upper Cambrian Trilobites in which the cephalon has a truncate-conical or subquadrangular glabella; a narrow concave frontal limb and smooth test.

Three species are described: *Chuangia nitida*, *C. mais* and *C. fragmenta*.

Genus *Menocephalus* Owen, 1852.

Doctor Owen proposed this genus for Trilobites having a highly convex hemispherical glabella, with a narrow border and broadly rounded front cheeks, tumid surface pustulate.

The genotype of *Menocephalus* was destroyed by fire many years ago.

Dr. Walcott does not include in the genus the species described by Billings under the names of *Menocephalus sedgwicki* and *M. glabrosus*, which he refers to *Solenopleura*, and remarks that *M. salteri* Devine, is the type of an undescribed genus.

The author describes *Menocephalus abderus*, the *Solenopleura abderus* Walc., 1905, *M. acanthus* Walc. (*Solenopleura acantha* Walc., 1905), *M. acerius* Walc., *M. acidalia* (*Solenopleura acidalia* Walc., 1905), *M. acis* Walc. and *M. admeta* Walc., *M. agave* Walc., *M. depressus* Walc., *M. sp. undt.*

Genus *Levisia* Walcott. Genotype *Agraulos agenor* Walc.

In this genus the cranidium is strongly convex, glabella truncate-conical, tumid and with only a trace of glabella furrows; occipital ring narrow, at the sides broadening rapidly toward the center, convex and extending backward into an obtuse spine; frontal limb narrow; fixed cheeks tumid, one-half as wide as the glabella and with small palpebral lobes midway of their length; postero-lateral limbs rather short and marked by deep, narrow intermarginal posterior furrow, that separates a narrow, rounded margin. The author describes *Levisia adrastia* Walc. (under the genus *Menocephalus* Walc., 1905), *Levisia agenor* Walc. under the genus *Agraulos* Walc., 1905) and *Levisia nasuta* Walc., *Levisia richardsoni* Walc. The last two species are from the Upper Cambrian at Point Levis, Canada.

Genus *Ptychaspis* Hall, 1863. Genotype *Dikelocephalus miniscoensis* Owen.

The author describes from China, *Ptychaspis bauho* Walc., *P. bella* Walc., *P. brizo* Walc., *P. causu* Walc., *P. cadmus* Walc., *P. calchas* Walc., *P. callisto* Walc., *P. calyce* Walc., *P. campo*, *P. ceto* Walc. and *P. sp. undt. Walc.*

Genus *Anomocare* Angelin, 1854. Genotype *A. laeve* Ang.

The author describes fourteen species under this genus, all new except three species, which he refers to Dames.

Anomocare alcinoe, *A. convexa*, *A. daulis*, *A. ephori*, *A. flava*, *A. latelimbatum* Dames, *A. lisani*, *A. megalurus* Dames, described under the genus *Liostracus*; *Anomocare minus* Dames, *A. nercis* Walc., described in 1906 under the genus *Ptychoparia*, *A. subquadratum* Dames (*Concephalus subquadratus* Dames), and *Anomocare sp. undt.* several forms.

Genus *Anomocarella* Walcott, 1905. Genotype *A. chinensis* Walcott.

This genus differs from *Anomocare* in the absence of glabella furrows and the presence of a relatively narrow flattened frontal rim, etc.

The author places twenty-two species under this genus.

Anomocarella albion, *A. bauvis*, *A. bergioni*, *A. bigsbyi*, *A. biston*, *A. butes*, *A. chinensis*, *A. comus* (*Ptychoparia comus* Walc., 1906), *A. hermas*, *A. irma*, *A. macar*,

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A. smithi, *A. speciosa* Lorenz (described by Lorenz under the genus *Anomocare*). *Anomocarella subrugosa* Walc. (*Ptychoparia* (*Liostracus*) *subrugosa* Walc., 1906).

Anomocarella tatian Walc., *A. temenus* Walc., *A. tenes* Walc. (*Ptychoparia tenes* Walc., 1905), *A. thraso* Walc., *A. toxes*, Walc., *A. tutia*, *A. undata* Walc.

The last five species were described by Walcott in 1905, and six under the genus *Ptychoparia*.

Genus *Coosia* Walcott, 1911. Genotype *C. superba* Walc.

The author refers to his type for the generic description, and includes five species under the genus.

Coosia bianos, *C. carme*, *C. daunus*, *C. decelus*.

All previously described in 1905 under *Anomocare*, except *Coosia carme*, which was originally included under *Anomocarella*.

Coosia robusta and *C. superba* Walcott.

Genus *Dolichometopus* Angelin, 1854. Genotype *D. svecicus* Ang.

Walcott places *Amphoton* Lorenz, 1906, as a syn.

The author describes five species from China.

Dolichometopus alceste Walc., *D. drois* Walc., syn. *Bathyriscus asiaticus* Lorenz and *Amphoton steinmanni* Lorenz, *D. derecto* Walc., *D. dirce* Walc., *D. hyrie* Walc.

Genus *Hysterolenus* Moberg, 1898.

The author only includes one species, *Hysterolenus* ? sp. undt.

Genus *Bathyriscus* Meek, 1873.

Bathyriscus manchuricus Walc.

Genus *Asaphiscus* Meek, 1873.

Asaphiscus iddingi Walc.

Genus *Illaenurus* Hall, 1863.

Illaenurus canens Walc., *I. ceres*, *I. dictys* Walc.

Ostracoda:

Genus *Aluta* Matthew.

The author includes under this genus six species previously described under the genus *Bradoria*.

Aluta hergeroni Walc., *A. cnyo* Walc., *A. cris* Walc., *A. fragilis* Walc., *A. sterope* Walc., *A. woodi* Walc.

Merostoma.

Genus *Amiella* Walcott, 1911.

Amiella yunnanensis Mansuy (MSS.).

—— Cambrian Geology and Palæontology—2, No. 13. *Dikelocephalus* and other genera of the *Dikelocephalinae*.

Smithsonian Misc. Collections, vol. 57, No. 13, 1914.

The author includes under the family *Dikelocephalina* Beecher, 1897, the following genera:

Dikelocephalus Owen, 1852.

Referring to the restricted genus the following species:

Dikelocephalus minnesotensis Owen, and a variation *D. dalyi* n. sp. The palpebral lobe of *D. dalyi* is shorter than in typical *Dikelocephalus*, in this respect, resembling some species of *Anomocare*, but not the typical species *Anomocare laevis* Angelin, *D. Texanus* n. sp.

Dikelocephalus hartti Walcott. This is the *Conocephalutes hartti* Walc., 1879.

D. limbatus Hall, *D. tribulis* Walc., 1912, and *D. vanhorni* n. sp. The cranium is much like the genotype, but it has a shorter glabella and wider fixed cheeks.

2. *Conocephalina* Brögger, 1886, genotype *C. ornatus* Brögger.

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Walcott refers *Dikelocephalus misa* Hall to this genus. The other species referred by Brögger to the genus, such as *Dikelocephalus oscicola* Hall, are referred by Walcott to a new genus *Osceolia*, and *Dikelocephalus spiniger* to the new genus *Calvinella*.

3. *Saukia*, new genus. The genus has a narrow frontal border about the cephalon, and a glabella proportionately more elongated than in *Dikelocephalus*. The pygidium is less expanded and more elongate than that of *Dikelocephalus*. Genotype *Dikelocephalus lodensis* Whitf.

The author describes *Saukia coloradocensis* n. sp., *S. crassimarginata* Whitfield, 1882, *S. fallax* n. sp., *junia* n. sp., *S. leptaenarum* Wiman, 1907; *S. leucosia* n. sp., *S. lodensis* Whitf. the type *S. marica* Wale, 1886; *S. pepinensis* Owen, 1852; *S. pyrene* n. sp., *S. rustica* n. sp., *S. stosei* n. sp., *S. wardi* n. sp.

4. *Osceolia*, new genus. This genus is characterized by its concave frontal limb, palpebral lobes, narrow fixed cheeks and transverse pygidium with its anterior segment extended beyond the margin as a long spine. Genotype *Dikelocephalus oscicola* Hall, 1863.

5. *Calvinella*, new genus. Genotype *Dikelocephalus spiniger* Hall, 1863. This genus is like *Saukia*, but differs in form of the glabella, presence of strong occipital spine, and proportionally more elongated pygidium. It differs from *Osceolia* in frontal limb of cephalon, presence of occipital spine and character of pygidium.

The author refers to the genus *Dikelocephalus newtonensis* Weller, 1903; *Calvinella ozarkensis* n. sp. *Dikelocephalus spiniger* Hall, 1863, and *Calvinella tenuisculpta* n. sp.

——— Cambrian Geology and Paleontology, Part 3, No. 1. The Cambrian faunas of Eastern Asia.

Smithsonian Misc. Coll., vol. 64, No. 1, 1914.

The author gives a historical review with a summary of the genera and species.

A new genus, *Tsinania*, with *Illaenurus canen* for the genotype, is given on page 43. The genus differs from *Illaenurus* Hall, in having the cranidium rounded in front, by the incurving of the facial sutures, and short postero-lateral limbs. He refers several species to the new genus previously included under Hall's genus, viz: *Tsinania canens*, *T. ceras*, *T. cleora* and *T. dictys*.

——— Cambrian Geology and Paleontology, No. 3. Cambrian Trilobites.

Smithsonian Misc. Coll., vol. 64, No. 3, 1916.

The author, under the Order Proparia, describes several new genera.

Family Menomonidae—*Menomonina* a new genus with *Conocephalites calymenoides* Whitfield as the genotype.

Millardia, a new genus with *M. semela* as genotype. Refers one new species *M. avitas* and *Conocephalites optata* Hall, also, to the genus.

Dresbachia, a new genus with *D. anata* as the genotype.

Norwoodidae, a new family with a new genus, *Norwoodia*, with five new species: Genotype *N. gracilis*, also *N. ponderosa*, *N. Saffordi*, *N. simplex* and *N. tenera*.

The cranidium, with its Ptychoparia-like glabella and small eyes and broad pleural furrows, are primitive, while the few thoracic segments (8 or 9) and relatively large tail, suggests the sub-family Phacopinæ. Under the order Opisthoparia, he describes *Agraulos stator* n. sp.; also *Acrocephalites Wallerius*, with a translation of that author's description of the genus, with nine new species. Refers *Solenopleura? stenometopa* Ang. and *Conocephalites vulcanus* Bill. to the genus.

Compares the new species *A. Haynesi* and *tutus* with the genotype, *Icrocephalites insignis* has narrower fixed cheek and frontal limb of *A. stenometopus*, *A. Americanus*

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is a larger species than the genotype. *A. aster* has a frontal boss much like the type. *Acrocephalites multisegmentus* has 25 thoracic segments. *A. aoris*, a species much like *A. tutus*; also *A. glomeratus*, a species like *A. ? majus*.

The author describes seven species under Lorenz's genus *Alokistocare*, of which *A. althea*, *A. ? labrosus*, *A. pomona* and *A. tida* are new. He refers *Ptychoparia ? Linnarssoni* and *P. ? prospectense* to the genus, and includes a figure and description of the genotype *Conocephalites subcornatus* Hall and Whitfield, which he compares with the new species *A. althea*.

The author includes under the genus *Lonchocephalus* eight species, five of which are described as new: *Lonchocephalus appalachia*, *L. bunus*, *L. pholus*, *L. plena*, *L. sospita*.

Describes and illustrates the genotype *L. Chippewaensis* Owen. Refers Shumard's *Conocephalites minor* and *C. minutus* Bradley to the genus.

Dr. Owen, plate 1-A, fig. 15, Geol. Sur. Wis., Iowa and Minnesota, 1852, p. 624, refers to *Lonchocephalus ?* a pygidium with lateral spines, similar to *Dikelocephalus loewensis*, which Walcott places as the genotype of *Crepicephalus*.

The author remarks that *Lonchocephalus* is most nearly related to *Liostracus* Angelin, with only the cranium for comparison. The difference between them is in the frontal limb and rim, and the absence of well-defined glabella furrows in *Liostracus*.

The author uses the *Conocephalites calciferous* for the genotype of a new genus *Saratogia*, placing under it six species, four new: *S. arses*, *S. aruno*, *S. hera* and *S. volux*, with *Crepicephalus Wisconsinensis* Owen; including as syn. *Dikelocephalus latifrons*, described by Hall, also by Shumard, under this genus.

In the family *Ceratopygidae*, genus *Crepicephalus* Walcott (not Owen), the author includes some 20 species.

Walcott uses *Dikelocephalus ? loewensis* Owen, for the genotype.

Owen's genus, as the name implies, was for a slipper-shaped, tapering glabella, a true *Ptychoparia* species, which Corda named in 1847. Dr. Owen used the term *Dikelocephalus* for the mattock-shaped heads, and refers to *Dikelocephalus* such species as Walcott genotype, although Owen referred to *Lonchocephalus*, a form like *Crepicephalus loewensis* Walcott, on p. 624, pl. 1-A, fig. 15.

Lonchocephalus might replace in part *Anomocare*, and *Crepicephalus* be referred to *Lonchocephalus* for Owen's *Lonchocephalus*, p. 624, pl. 1-A, fig. 15.

Walcott divides the pygidiae into two groups:

1. The *Crepicephalus loewensis* group.

In which the postero-lateral margins of the pygidium extend backward on each side from a broad base into a sharp, narrow spine. Test nearly smooth. Upper Cambrian.

2. *Crepicephalus Texanus* group.

In which the postero-lateral spines are long, slender, and attached to the side of the pleural lobe above the margin. Test granulated. Lower Cambrian.

The author describes and figures *Crepicephalus angusta*, *C. camiro*, *C. comus*, *C. cossensis*, *C. coria*, *C. dis*, *C. loewensis* (Owen) *A. Liliana*, *C. Texanus* (Shumard) var. *danace* and *elongatus*, *C. thoosa*, *C. tripunctatus* (Whitfield) also var. *magnispinus*, *C. tumidus*, *C. unca*, *C. unzia*, *C. upis*, and two doubtful species.

Under the Family *Oryctocephalidae*, the author includes the new genus *Vanuxemella*. This genus, represented by *V. contracta* and *V. nortia*, from the Lower Cambrian, has a simple form, with some features suggesting *Albertella*. It differs in absence of glabellar furrows, shorter eye lobes, absence of prolonged third segment of thorax, with only four thoracic segments. The long spines of the tail spring from about the fifth segment, while in *Albertella* they appear to be the extension of the first or second anterior segment.

Walcott includes under his genus *Karlia* the genotype *K. minor* and *Menocephalus*

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Salteri? Rominger, which he refers to *Karlia Stephensis*. Dr. Matthew, 1899, refers the genus to *Dorypyge*, and the species to *Dorypyge Dawsoni*.

The author describes a new genus *Hanburia* with its genotype *H. gloriosa*. Remarks the large pygidium and few thoracic segments suggest the order *Opisthoparia* and family *Asaphidae*. From Burgess Pass above Field, B. C.

Under *Tsinania*, the *Ilacnurus canus* Walc., as the genotype, Walcott, includes the new species *T. clora* and *T. elongata*.

Plate 38 gives figures of *Wanneri Walcottana*, figs. 1 and 2.

——— Cambrian Geology and Palaeontology—3. No. 5. Cambrian Trilobites.

Smithsonian Misc. Collections, vol. 64, No. 4, pp. 303-456, plates 45-67, 1916.

The author describes and illustrates the following Cambrian Trilobites:

Corynexochus bornholmensis Grönwall, *C. brennus* Walc., *C. bulbaris* Walc., *C. capito* Walc., *C. clavatus* Walc., *C. delagei* Miquel, *C. minor*, *C. senectus* (Billings), *C. spinulosus* Ang., *C. stephensis* (Walc.).

Refers *Corynexochus romingeri* Matt. to *C. stephensis*, *Corynexochus*? *umbonatus* Angelin to the genus *Æglina*.

The new subgenus *Bonnia* is proposed as a subgenus to *Corynexochus*, with *Bathyrus parvulus* as the genotype.

The author includes *Corynexochus (Bonnia) busa* nov., *C. (Bonnia) fieldensis*, the *Protypus fieldensis* Walcot, 1908.

Corynexochus (Bonnia) parvulus the *Bathyrus parvulus* Billings, 1861.

Sub-family *Dolichometopinae*.

Bathyriscus adaeus nov., *B. anax* nov.

The *Bathyriscus productus* (H. & W.) Walc., in part, 1886, Bull. U. S. Geol. Sur., No. 30, pl. 30, fig. 1, 1a, 1b, 1g and 1h.

Bathyriscus atossa nov., *B. bantius* nov., *B. batis* nov., *B. belesis* nov., *B. belus* nov., *B. ? bithus* nov., *B. Haydeni* Meek, *B. Howelli* Walc., *B. Manchuriensis* Walc., *B. ornatus* Walc., *B. rotundatus* Rominger, *B. Stoliczkaei* Reed, *B. sp.* undetermined, Nos. 1 and 2.

Bathyriscus (Poliella) new subgenus.

Most of the species of *Poliella* are small, with from seven thoracic segments to eleven segments and a small pygidium.

The genotype *Bathyriscus (Poliella) anteros* Walcott.

The author includes eight species under the subgenus: *Bathyriscus (Poliella) anteros* nov., *B. (P.) powersi*, *B. (P.) occidentalis* nov., *B. (P.) primus*, *B. (P.) caranus* nov., *B. (P.) sylla*, *B. (P.) balus* nov., *B. (P.) probus*.

Dolichometopus.

Dr. Walcott refers eleven species to this genus: *Dolichometopus acadicus* Matt., *D. ? alceste* Walc., *D. baton* Walc., *D. ? bessus* Walc., *D. bion* Walc., *D. boccar* Walc., *D. ? deois* Walc., *D. ? derceto* Walc., *D. ? dirce* Walc., *D. ? expansus* (Walc.), *D. productus* (H. & W.), *D. succicus* Ang., *D. tontoensis* Walc.

The other species of *Dolichometopus*, such as *Dolichometopus ? convexus* Billings, referred to *Bolbocephalus*, *D. ? gibberulus* Bill., to *Platycolpus*, *D. hyic* Walc., to *Anomocare*, *D. occidentalis* Matt. to *Bathyriscus*, *D. ? rarus* Bill. to *Bolbocephalus*, *D. tatei* Woodw. to *Redlichia*.

The author forms a new subgenus, for certain species with a small palpebral lobe, that lack genal spines on the free cheek, with *Dolichometops (Housia) zarro* Walcott as the genotype.

Family *Asaphidae*, sub-family *Ogygiocarinae*.

WALCOTT (Charles D.)—Continued

Ogygopsis Klotzi (Rominger).

Orria new genus, with *Orria elegans* Walcott, as the genotype. Both Orria and Ogygopsis suggest a stage of development between Bathyriscus and Ogygiocaris. The form is Ogygopsis-like, but differs in that the cephalon is smaller in proportion to the thorax and the pygidium; fixed cheeks nearly absent between palpebral lobes and glabella; palpebral lobes large and close to glabella; postero-lateral limbs long and narrow antro-lateral limbs; only a narrow space between the glabella and facial sutures; pleural grooves of thorax segments broad and straight, instead of narrow and diagonal.

Asaphiscus the author refers to the genus.

Asaphiscus calenus Walc., *A. camma* Walc., *A. ? capella* Walc., *A. ? granulatus* Walc., *A. Iddingsi* Walc., *A. ? minor* Walc., *A. ? unispinus* Walc., *A. Wheeleri* Meek, the genotype; also *A. agatho* Walc., *A. ? anaxis* Walc., *A. calanus* Walc., *A. ? duris* Walc., with three sp. undt., and *A. ? florus* nov.

Blainia new subgenus.

The species referred to Blainia have nine thoracic segments and from six to eleven distinct anchylosed segments in the pygidium. Genotype *Asaphiscus (Blainia) gregarius* Walc.

Dr. Walcott includes four new species under the subgenus:

Asaphiscus (Blainia) elongatus, *A. (B.) glabra*, *A. (B.) paula*.

Blountia new genus.

The author refers seven species to this genus. Genotype *Blountia minula* Walc., *Blountia ? alemon* Walc., *B. alethes* Walc., *B. alexas* Walc., *B. amage* Walc., *B. andreas* Walc., *B. anser* Walc., and *B. mimula* from the Upper Cambrian.

Maryvillia new genus. Genotype *M. Arion* and *M. Ariston* nov.

The pygidia associated with the cranidia of these species are elongate, with about fourteen segments, which suggest transition from Blountia to Tsinania, as represented by such species as *Tsinania canens* Walc., etc.

Family Olenidae: Marjumiæ new genus. Genotype *M. typha* Walc.

This genus appears to unite characters found in several genera. The cephalon is essentially that of Asaphiscus, the thorax that of Ptychoparia, and the pygidium that of *Peltura scaraboides* and *Parabolina megalops*.

In addition to the type the author describes *Marjumiæ callas* nov. Lisania Walc. genotype *Anomocarella bura* Walc. and *L. ? breviloba* nov.

Ilacnurus quadratus Hall.

Mesonacis Gilberti Meek.

Proparia, Family Eodiscidae: Pageti new genus. Genotype *P. bootes* Walc. The new genus was proposed for the forms of Eodiscidae, in which the eye, the free cheeks and facial sutures are developed. Two species described *Pageti bootes* and *P. clytia*.

——— Cambrian Geology and Palæontology IV, No. 2. The Albertella fauna in British Columbia and Montana.

Smithsonian Misc. Coll., vol. 67, No. 2, 1917, May 9, 1917.

The author describes from this formation the following Crustaceæ:

Agraulus stator Walc.

Ptychoparia candance nov.

The elongated body and small pygidium suggest *Agraulus stator*, but the cranidium is that of Ptychoparia, and there are 16 thorax segments, while *A. stator* has 22, a middle Cambrian form.

Ptychoparia ? charax nov.

This species is probably a subgenus with a Ptychoparia-like cranidia, with a broad concave frontal border and rim, that will undoubtedly be placed in a subgenus.

WALCOTT (Charles D.)—Continued

Psychoparia ? cilles nov. *P. pylas* nov., from Gordon Creek, Montana.

Crepicephalus chares nov., related to *C. camiro*.

Vanuxemella nortia Walc. *Olenopsis* cf. *Americanus* Walc.

Albertella Bosworthi Walc., *A. Helena* Walc., *A. leviss* nov.

Zacanthoides charilla nov. compares *Z. idahoensis* *Z. ? cimon* nov., *Z. cnopus* nov., the thorax has the great median spine on the 8th segment instead of the 5th as in *Z. Idahoensis*.

Neolenus constans nov.

Bathyriscus Rossensis nov., characterized by the very much produced genal spines extending backwards to the pygidium.

Bathyriscus cf. *Rossensis* nov. The glabella is longer and more slender proportionally than that of *Rossensis*.

but differs in many details.

Bathyriscus (Poliella) chilo nov.

Differs from *B. (P.) syla* of the Chetang formation in the nearly straight sides of the glabella, and narrower and shorter associated pygidium. Related to *B. (P.) primus*,

Wallereus (Iran D.) Undersökungen öfver zonen med *Agnostus laevigatus* 1. Vestergötland Jämta en inledande öfversikt af Vestergötlands samtliga Paradoxidesläger Lund, 1895, 72 pp., plate.

Agnostus laevigatus Dalm. also var. *armata* Lins., *A. exculptus* Ang., also forma *sulcifera*, *integra*, *Agnostus planicauda* Ang.; also forma *vestgothica*, *A. pisiformis* Linné *A. fallax* Lins. forma *ferox* Tulb. and var. *insignis* n. var.

Conocephalus suecicus n. sp.

Acrocephalites stenometopus n. gen. for Angelin's *Solenopleura ? stenometopus*. It is characterized by a suture running inwards to the rim of the head shield in front of the eyes, a pointed front to this shield, and a small knob in front of the glabella.

Liostracus costatus Ang. *Proceratopyge conifrons* n. gen. et sp. This genus, as its name indicates, is the typical species of the Ceratopyge. It differs in its conical glabella, its four pairs of glabella furrows and the triangular front fold of the rim.

Toxotis pusilla n. gen. et sp. This is a remarkable genus, which retains several embryonic or early larval characters, as the narrow glabella, and three swellings on the front of the shield.

Paradoxides sp. *Leperditia primordialis* Lins. This paper was reviewed by G. F. Matthew, Amer. Geol., vol. 17, 1896, pp. 49-50.

Walther (Karl). Das Unterdevon zwischen Marburg a. L. und Herborn Nassau.

Neues Jahrb. Mineralogie, Beil., vol. 17, 1903, pp. 1-75, 4 plates.

Cryphaeus laciniatus F. R., *C. Lethaeae* Kays. *Cryphaeus* sp. *Homalonotus armatus* Burm., *H. gigas* A. Roem., *H. crassicauda* Sandb. *Homalonotus* sp. *Lichas* cf. *Haueri* Barr. *Phacops* sp.

Ostracoda: *Beyrichia strictisulcata* (Sand.) Jones. *Bollia varians* (Sand.) Jones.

—— Beitrage zur Geology and Palaont des älteren Paläoz in Ostthuringen.

Neues Jahrb. für Mineral, etc., 1907, Bd. XXIV.

Ward (J.) Contributions to the geology and palaontology of North Staffordshire, No. vi. Palaontology of the Cheadle Coalfield.

Stone Rep. N. Staff, F. Cl. 40, 1906, pp. 102-137, pl. 2.

Wanner (Arteus). A new species of *Olenellus* from the Lower Cambrian of York County, Penn.

Proc. Washington Acad. Sci., vol. 3, 1901, pp. 276-272, plate.

Olenellus (*Holmia*) *Walcottanus* n. sp.

Dr. Walcott refers this to his new genus *Wanneria*.

Wenjukow (P. N.) Die Fauna der Silurischen Ablagerungen des Gouvernements Podolien.

Mater. Geol. Russ., vol. 19, 1899, pp. 21-266, plates 1-9.

Trilobita: *Encrinurus punctatus* Brunn., *E. ? obtusus* Ang. *Sphaerexochus mirus* Beyr. *Iliaenus* (*Bumastus*) *barriensis* Murch., *I. Bouchardi* Barr. *Calymmene tuberculata* Brunn. *Phacops* (*Acaste*) *Doeringiae* Murch., *P. (Odontochile)* *caudatus* Brunn. *Proetus concinnus* Dalm. *Eurypterus Fischeri* Eichw.

Ostracoda: *Leperditia tyraica* Schm. *Beyrichia inornata* Alth., *B. idonea* n. sp., *B. Buchiana* Jones, *B. inclinata* n. sp., *B. Reussi* Alth. *Entomis reinformis* n. sp. *Primitia concinna* Jones.

Weller (Stuart). Descriptions of the Cambrian Trilobites from New Jersey, with notes on the age of the Magnesian Limestone series.

Ann. Report Geol. New Jersey for 1899, pp. 47-53, plate.

The species described are *Olenellus Thompsoni* Hall. *Liostracus ? jerseyensis* n. sp. Referred to *Solenopleura* by the author in *Palaeontology New Jersey*, vol. 3, p. 119.

——— Report on the Palaeontology of New Jersey.

Geol. Sur. New Jersey, vol. 3, Trenton, 1903, 388 pp., 23 plates.

Cambrian Fauna: *Olenellus Thompsoni* Hall, *O. sp. undet.*

Ptychoparia Blairi n. sp., *P. Newtonensis* n. sp., *P. calcifera* Wale., *P. sp. undet.* *Agraulos saratogensis* Wale. *Solenopleura jerseyensis* n. sp. *Anomocare parvula* n. sp. *Dikelocephalus newtonensis* n. sp. Referred by Walcott to *Calvinella*.

Ordovician Fauna: *Asaphus canalis* Whitf. Referred to *Asaphella gryracanthus* by Raymond. *Iliaenurus columbiana* n. sp. Referred to *Symphysurus convexus* *Bathyrurus sp. undet.*

Trenton Fauna: *Harpina ottawensis* Bill. Referred to *Eoharpes* by Raymond. *Trinnucleus concentricus* Eaton. *Isotelus gigas* DeKay. *Ptychoparia jerseyensis* n. sp. Referred to *Bathyrurus longispinus* Wale., by Raymond. *Bumastus trentonensis* Emm. The author figures the small species described by Emmon under *Iliaenus*, with eight thorax segments. This is taken for the type by Clarke, and described as *Bumastus* by Billings under the name of *Milleri*. Emmon's *Bumastus trentonensis* is a larger species; referred by Raymond to *Bumastus Billingsi*. *Bumastus transversalis* n. sp. and *B. elongatus* n. sp. *Proetus latimarginatus* (name pre-occupied by H. & C.). *Proetus Welleri* nov., *P. brevimarginatus* n. sp. *Cyphaspis trentonensis* n. sp. *Bronteus lunatus* Bill. *Arges tuberculatus* n. sp. *Platymetopus trentonensis* Conrad. *Odontopleura parvula* Wale. *Encrinurus trentonensis* Wale. and *Calymmene senaria* Conrad. *Ceraurus pleuranthemus* Green. *Pseudosphaerexochus trentonensis* Clarke. *Pterygometopus callicephalus* Hall, *P. intermedius* Wale.

Ostracoda: *Leperditia fabulites* Conrad, *L. ornata* n. sp. *Eurychilina oculifera* n. sp., *E. jerseyensis* n. sp.

Silurian Fauna: *Proetus pachydermatus* Barrett, *P. ? depressus* n. sp., *P. spinosa* n. sp. (a doubtful species of *Proetus* or *Phacops*). *Calymmene camerata* Conrad. *Dalmanites aspinosa* n. sp.

Ostracoda: *Leperditia altoides* n. sp. *Beyrichia sussexensis* n. sp., *B. Barretti* n. sp., *B.*

WELLER (Stuart)—Continued

perinflata n. sp., *B. jerseyensis* n. sp., *B. nearpassi* n. sp., *B. deckerensis* n. sp. *Bathocypris nearpassi* n. sp.

Devonian Fauna: *Dalmanites pleuroptyx* Green. *Proetus protuberans* Hall. *Lichas pustulosus* Hall. *Homalonotus l'auxemi* Hall. *Phacops Loganii* Hall. *Dalmanites dentatus* Barrett. *Homalonotus DeKayi* Green. *Phacops rana* Green. *Dalmanites* sp. and *D. alchiops* Green.

Leperditia alta Conrad. *Beyrichia Kummelli* n. sp., *B. wallpackensis* n. sp., *B. montaguensis* n. sp., *B. Smocki* n. sp., *B. nantliensis* n. sp. *Leperditia elongata* n. sp., *L. gigantea* n. sp. (pre-occupied for a species by Roemer).

—— The Palaeontology of the Niagaran Limestone in the Chicago area—The Trilobita.

Bull. Chicago Acad. of Sciences, No. iv, part 2, 1907, pp. 163-281, plates 16-25.

The author gives classification of the Trilobita and bibliographic list of the species of North American Silurian Trilobita; also a description of the following species:

Harpes Telleri n. sp. *Illaenus insignis* Hall, *I. Harrisii* n. sp., *I. niagarensis* Whitf., *I. armatus* Hall, *I. ioxus* Hall, *I. graftonensis* M. & W., *I. transversalis* n. sp., *I. imperator* Hall, *I. cuniculus* Hall, *I. chicagoensis*, n. sp.

Illaenoides n. gen. Similar to *Illaenus*, but with the head more strongly trilobed, with longer and stronger dorsal furrows. The eyes are small and situated much farther forward than in *Illaenus*. Thorax and pygidium as in *Illaenus*.

Illaenoides triloba n. sp. *Proetus channahonensis* n. sp., *P. Handzverki* n. sp. *Cyphaspis intermedia* n. sp. *Bronteus acamas* Hall.

Lichas: *Corydocephalus phlyctinodes* Green. *Dicranopeltis decipines* W. & M., *D. nasuta* n. sp., *D. Telleri* n. sp. *Metopolichas pugnax* W. & M., *M. Ferrisi* n. sp. *Arctinurus occidentalis* Hall, *A. chicagoensis* n. sp. *Acidaspis Vanhorni* n. sp. *Odontopleura illinoisensis* n. sp. *Ceratocephala geniata* Warder. *Encrinurus Egani* Miller, *E. tuberculifrons* n. sp. *Calymmene niagarensis* Hall. *Ceraurus niagarensis* Hall, *C. Hydei* n. sp. *Sphaerexochus Romingeri* Hall. *Deiphon americanus* n. sp. *Stauropscephalus obsoleta* n. sp. *Phacops Handzverki* n. sp. *Dalmanites platycaudatus* n. sp., *D. illinoisensis* n. sp., *D. vigilians* Hall, *D. arkansanus* Van Ingen, *D. verrucosus* Hall.

—— Kinderhook faunal studies. The Fauna of the Fern Glen Formation.

Bull. Geol. Soc. Amer., vol. 20, pp. 265-332, pls. 10-15, 1909.

Proetus fernglenensis n. sp.

The author compares this with *Proetus missouriensis*, but that species is proportionately longer, with a glabella which is somewhat broader and subtruncate in front.

—— Descriptions of new species of Ordovician fossils from China.

Proc. U. S. Nat. Mus., vol. 32, No. 1549, 1907, pp. 557-563.

The Trilobites described are *Ampyx chinensis* n. sp. *Asaphus blackwelderi* n. sp., *A. asiaticus* n. sp., *A. tainingensis* n. sp., *A. laevis* n. sp., *A. chinensis* n. sp. *Megalaspis minor* n. sp. *Illaenus bronteoides* n. sp. These species were afterwards figured in Researches in China, Carnegie Inst. of Washington, vol. 3, 1913.

—— A report on Ordovician fossils collected in Eastern Asia in 1903-04.

Research in China, vol. 3, 1913, pp. 279-294, plates 25-26.

The author describes *Ampyx chinensis* allied to *A. nasutus* Dalman. *Ampyx* sp. cf. *A. costatus* Boeck. *Bathyrurus* sp. undt.

Asaphus blackwelderi n. sp. The Chinese species may be distinguished from *A. expansus* Dalman, on account of its obsolete glabella.

WELLER (Stuart)—Continued

Asaphus tanningensis n. sp., *A.* sp. cf. *A. expansus* Dalman, *A. asiaticus*, *A. laevis* Weller, *A. chinensis* Weller.

The author also describes several species of the *Asaphus* without identification.

Megalaspis minor Weller. *Iliaenus bronteoides* Weller. *Proetus* sp. undt. *Calymmene* sp. undt. *Pterygomotopus* sp. undt.

The author remarks, that among the Trilobites the most conspicuous feature in the Chinese fauna is the great variety of *Asaphidae* belonging to the genera *Asaphus*, *Megalaspis* and *Isotelus*.

Westergård (A. H.) Index to N. P. Angelin's *Palaontologia Scandinavica*, with notes, Lund, 1910.

Meddelande från Lund's Geologiska Fätklubb, Ser. B, No. 5.

The author remarks that the first fasciculus of the work, which is printed in quarto and written in Latin, (the copy I have bears no date. Plate 22 was not issued in this edition), but published in Fasc. 2, was issued in 1851 with pp. 1-24, and plates 1-xxiv, under the title, "*Palæontologia Svecica*."

Lindström's edition, 1878, states that this appeared in 1852.

The second fasciculus, containing plates xxv-xli and pp. 25-92 (or rather pp. 21-92, because the latter part of the third sheet of fasc. 1 was reprinted in essentially altered form), appeared in 1854, when the title of the work was also altered into "*Palæontologia Scandinavica*," for the evident reason that there are a great number of species from Norway and Bornholm cited in this fasciculus. Pages 1-lx were added, containing an account of Silurian stratigraphy, and one page of "*Addenda et Corrigenda*," besides which plates xx and xxii were exchanged for new ones.

In 1878 the entire work was re-edited by G. Lindström, under the title of "*Pars I Iconographia Crustaceorum Formationis Transitionis*." In this work fasc. 1 and 2 form only the first part of the projected work.

In 1855 Angelin got a public subvention for editing fasc. 3. This was not published, but several of the plates, intended for this fasc. were printed. Two of these plates, A and B, reproductions exclusively of Crustacea, have probably been appended to privately distributed copies of *Palæontologia Scandinavica*. Some of these plates distributed in some way are cited in literature, Grönwall Danm. Geol. Unders. 11 Raekke, No. 13, p. 107 (note at foot of page), quotes Table XLIII, on which *Paradoxides Davidis* Salter is reproduced under the name *Paradoxides Pingelli* Beck MS.

Before Angelin set to work writing "*Palæontologia Scandinavica*," he sold collections of Swedish fossils, several of which he had himself named. A list of these collections, embracing five decades, was printed under the title "*N. P. Angelini Mus. Pal. suecicum, Sectio prima, Petrefacta formationis s. d. transitionis superioris centuria, 1 ma.*"

When Angelin in "*Palæontologia Scandinavica*" cites one of these new species he puts "nob" after the name and not new species.

The notes on pp. 12-48, contain notes and corrections to Angelin's work. Lorenz, since the issue of this Index, has referred *Solenopleura branchymetopus* Ang. to the genus to *Ptychoparia*.

These notes are supplementary to page 1, Occasional Paper iv, Cal. Acad. of Science, 1893.

In a note to the author from Dr. Sv. Leonh. Törnquist, who was a student under Angelin, he remarks, that "as to the plates XLIII-XLV of '*Palæontologia Scandinavica*,' Angelin seems himself to have rejected them. Be this as it may, when after the author's death the work was re-edited by the Academy of Science, it was decided that the said plates, owing to their incorrectness, should be maculated, and all the copies were accordingly destroyed, in order to prevent their being cited. Some proof sheet may,

however, have escaped destruction since, and Angelin's memory will certainly be best served if they are not mentioned."

Whitborne (C. F.) Descriptions of the Fossils from the Morte Slates. Quart. Jour. Geol. Soc. London, vol. 53, 1897, pp. 445-462, plate 31.

Dalmanites (Cryphaerus) laciniatus F. Rom. *Dalmanites* sp. *Homalonotus* sp.

Whiteaves (J. F.) Preliminary list of fossils from the Silurian (Upper Silurian) rocks of the Ekwon River and Sutton Mill Lake. Keewatin collection by D. B. Dowling in 1901, with descriptions of such species as appear to be new.

Report Bureau of Mines, 1912, vol. 21, part 2, pp. 157-168.

Crustacea Isochilina or Leperditia sp. indet.

Calymene Niagarensis Hall. *Iliaenus* sp. indet. *Bronteus Ekwonensis* sp. nov., *B. aquilonaris* sp. nov. *Ceraurus Tarquinius* Billings.

These species were also described in Geol. Sur. Canada, Ann. Report, new ser., vol. 14, 1901, F. Appendix I, pp. 38-60.

White (David). Fossil Flora of the Coal Measures of Brazil.

Comissão de Estudos das Minas de Carvão de Pedra do Brazil. Final Report by I. C. White, 1908.

David White describes under the name of *Hastimima xchiteri* certain fragmentary remains from the Carbonic plant beds of Santa Catharina—a doubtful plant, referred by palaeontologists to the Eurypteridae as the genus *Hastimima* White.

Whitfield (R. P.) Contributions to the Palaeontology of Ohio.

Geol. Survey Ohio, vol. 7, 1893, pp. 407-494, plates 1-13.

Eurypterus Eriensis Whitf., *Leperditia alta* Conrad. *Echinocaris sublevis* Whitf., *E. pustulosa* Whitf., *E. multinodosa* Whitf. *Palacopalaeon Newberryi* Whits. *Aristozoe Canadensis* n. sp.

Echinocaris Punctatus Whitfield

——— Observations on the fauna of the rocks at Fort Cassin, Vermont, with descriptions of a new species.

Bull. Amer. Museum Nat. Hist., vol. 5, 1880, pp. 25-39, plates.

Bolbocephalus Scelyi n. gen. et sp., *B. truncatus* n. sp. *Bathyrurus (Bathyrurella) planicephalus* n. sp.

——— Notice and description of new species and new genus of Phyllocardae.

Bull. Amer. Museum Nat. Hist., vol. 7, 1896, pp. 299-304.

Entomocaris Telleri n. gen. et sp. *Ceratiocaris Monroei* n. sp., *C. poduriformis* n. sp.

——— Note on the hypostoma of *Lichas (Toralaspis) grandis*, Hall.

Bull. Amer. Museum Nat. Hist., vol. 9, 1897, pp. 41-42, figures.

WHITFIELD (R. P.)—Continued

——— and Hovey (E. C.) Catalogue of the type and figured specimens in the Palaeontological collection of the Geological Department American Museum Natural History.

Bull. Amer. Museum Nat. Hist., vol. xi, 1900, 356 pp.

Williams (H.) assisted by Breger (C. L.) The Fauna of the Chapman Sandstone of Maine.

U. S. Geol. Sur. Prof. Papers No. 89, 1916.

The authors describe *Homalonotus laticaudatus* nov., distinguished from *H. delphinocephalus* by its broader pygidium, very much like the Rheinisch Devonian sp., *H. crassicauda* Sandb. *Homalonotus Vanuxemi* Hall. *Phacopidella Chapmani* nov., compares *P. anceps* and *P. mylanderi* Dalmanites? (Synphoria) a and b sp. nov.

Ostracoda: *Ctenobolbina*? *cornuta*.

Zygobeyrichia nov. gen. Genotype *Z. devonica* Jones and Woodward, 1889. The new generic name is proposed for a group of large Beyrichidae that seems to represent a departure from the type from the Silurian stock.

Zygobeyrichia apicalis nov. and *Z. extrema* nov. This is distinguished from *Z. apicalis* by its shorter and more gibbous form; and from species of Kloedenia it differs by the complete loss of the posterior lobe, the greater depth and length of the sulcus and the ventral prolongation, etc.

Williams (N. Y.) An Eurypterid Horizon in the Niagara Formation of Ontario.

Canada Dept. of Mines Mus. Bull. No. 20, Geol. ser. No. 29, 1915, pp. 51, pls. 5.

Wiman (Carl). Studien ueber das Nordbaltische Silurgebiet. 1.

Geol. Institut. Upsala, No. 11, vol. vi, part 1, 1902, with 4 plates and map.

Olenellus sp. *Paradoxides* sp. *Arionellus balticus* n. sp. *Ellipsocephalus latus* n. sp. *Ellipsocephalus* sp.

Aparchites? *Anderssoni* n. sp., *A.*? *fennicus* n. sp. *Beyrichona gevalensis* n. sp., *B. jaba* n. sp., *B.*? *alta* n. sp. *Ostracod* sp. *Sellula fallax* n. sp. *Bradorona nitida* n. sp. *Indiana*? *minima* n. sp. *Hipponicharion Matthevi* n. sp.

Acerocare norvegicum Mbg. *Geratopyge forficula* Sars. *Shumardia oelandica* Mbg., *S. bottnica* n. sp. *Trilobite*.

The author gives a bibliography of the literature on the Baltic Silurian, with quotations and figures from Roberg's *Dissertatio academica de fluviali astaco ejusque usu medico*, Upsala, 1715, p. 32; and refers his figure 1 to *Megalaspis limbata* Sars and Boeck; figure 2 to the pygidium of an *Asaphus*.

——— Ein Shumardiaschiefer bei Lanna in Nerike.

Arkiv. for Zoologi K. Svenska Vet. Ak. ad Stockhölms, Bd. 2, No. 11, 1905.

Apatoccephalus pecten n. sp. *Megalaspis planilimbata* Ang., *M. nericiensis* n. sp. *Niobe laeviceps* Dalm. *Niobe* sp. Nos. 1 and 2. *Symphysurus breviceps* Ang. *Ampyx brevicauda* n. sp. *Agnostus glabratus* Ang., *A. glabratus* Ang. var. *ingricus* Fr. Schmidt, *A. lentiformis* Ang., *A.* sp. *Shumardia nericiensis* n. sp. *Orometopus* sp.

Wilson (Alice E.) and Mather (Kirtley F.) Appendix 11. Synopsis of the common fossils of the Kingston area.

25th Ann. Rep. Ontario Bureau of Mines, 1916, pp. 45-66, plates 1-3.

The authors illustrate as Black River fossils, Ordovician species. *Bumastus Milleri* (Bill.) and *Isotelus gigas* DeKay. *Bathyrus extans* Hall. *Onchometopus simplex* R. & N.

Ostracoda:

Isophilina armata Walc. *Leperditia fabulites* Conrad and *L. tumida* Ulrich.

Trenton Fossils:

Calymmene senaria Conrad. *Ceraurus dentatus* R. & B. and *Isotelus gigas* DeKay.

*Wood. On the classification of Trilobites. (Not seen.)

The Cambridge Natural History, vol. 4, 1909.

Wood (Elvira). Marcellus (Stafford) Limestone Erie County, N. Y. Bull. New York State Mus., No. 49, 1901, pp. 139-181.

Phacops rana Green. *Cryphaerus Boothi* Green, *C. craspedota* Hall. *Primitopus punctulifera* Hall.

Woods (Henry). The Cambridge History. The Crustacea and Arachnids Eurypteridae, 1909.

Vol. 4, Chapter xi, pp. 283-294.

Woodward (Henry). On some points in the structure of the Niphosura, having reference to their relationship with the Eurypteridae.

Quart. Jour. Geol. Soc. London, vol. 22, 1867, p. 28.

On page 32 the author uses the term *Prestwichia* for a new genus with *Prestwichia anthrax* Prest. for the type. This generic name was used by Lubbock in 1863, therefore it is a syn. and the genus *Euproops* Meek is available for the genus.

——— On the discovery of Trilobites in the Upper Green (Cambrian) slates of the Penrhyn Quarries, North Wales.

Quart. Jour. Geol. Soc. London, vol. 44, 1888, p. 74, pl. 6.

Concoryphe viola nov.

Its peculiar facial sutures suggest a new generic name.

——— Note on a collection of Carboniferous Trilobites from the Banks of the Hodder near Stonyhurst, Lancashire.

Geol. Mag., Dec. iv, vol. 1, 1894, p. 481, plate 14.

Phillipsia van-der-Grachtii n. sp., *P. Polleni* n. sp.

The author also gives figures of the pygidia of *Phillipsia Derbiensis* Martin and *P. gemmulifera* Phillips.

——— Contributions to our knowledge of the genus *Cyclus* from the Carboniferous formation of various British localities.

Cyclus Jonesianus H. W., *C. radialis* Phil., *C. Scottii* H. W., *C. Johnsoni* H. W., *C. Rankini* H. W.

Geol. Mag., Dec. iv, vol. 1, 1894, pp. 530-539, plate 15.

The curious little shield-like Crustaceans, classed under *Cyclus*, were first noticed by de Koninck in 1841—Descript. des Animaux Foss. Carb. de Belg. 1842, p. 591, plate 53—and have been subsequently illustrated and described by various authors.

——— On a collection of Trilobites from Coddon Hill beds, Lower Culm Measures near Barnstaple, Devon, and one from Glamorganshire.

Geol. Mag., Dec. iv, vol. 9, 1902, pp. 481-487, plate 20.

Griffithides Barksii n. sp. *Phillipsia spatulata* n. sp. *Proetus Coddonensis* n. sp.

For previous papers on the Culm Trilobites see: Henry Woodward, on the discovery of Trilobites in the Culm Shales, Geol. Mag., 1884, pp. 534-545, pl. xvi; Woodward Carboniferous Trilobites, Mon. Pal. Soc., 1883-1884, p. 1-86, plates 1-x; G. J.

WOODWARD (Henry)—Continued

Hinde and Howard Fox, The Radiolarian rocks in the Lower Culm-measures, Quart. Jour. Geol. Soc., 1895, vol. 51, pp. 609-668, plates 23-28; note on the Trilobites, by Henry Woodward, pp. 646-649, plate 28, figures 1-8.

——— The Canadian Rockies. Part 1. On a collection of Middle Cambrian fossils obtained by Edward Whymper from Mount Stephen, B. C.

Geol. Mag., Dec. iv, vol. 9, 1902, pp. 529-544, 17 figures.

Ogygopsis Klotzi Rom. *Bathyriscus Howelli* Walc., *B. (Kootenia) Dawsoni* Walc., *B. pupa* Matth. *Neolenus serratus* Rom., *N. granulatus* Matth. *Ptychoparia Cordilerae* Walc. *Zacanthoides (Olenoides) spinosus* Walc. *Oryctocephalus Walkeri* Matth., *O. Reynoldsi* F. R. Cowper Reed.

Conocephalites (Conaspis?) cf. *perseus* Hall. *Corynexochus Roemergeri* Matth. *Dolichometopus occidentalis* Matth. *Agnostus interstrictus* White, *A. montis* Matth. *Anomalocaris Canadensis* Whiteaves.

Dr. Henry Woodward, one of the best authorities on recent and fossil Crustacea, retains Rominger's genus *Ogygopsis*, and remarks that *Ogygopsis Klotzi* differs from *Ogygia* proper in having a well-defined ocular ridge and a narrow palpebral lobe. It seems convenient to separate this Rocky Mountain form generically from the other examples of *Ogygia*.

——— On two Trilobites from the Devonian Slates of Cornwall, obtained by Walter Barratt, Esq.

Geol. Mag., Dec. iv, vol. 10, 1903, pp. 28-31.

The author figures *Homalonotus Barratti* n. sp., and gives a list of English Devonian species of Devon and Cornwall.

Phacops latifrons? Bronn—a fragment—is referred to this genus.

——— Note on some fragmentary remains of fossils from the upper part of Mount Noyes (Cambrian Rockies).

Geol. Mag., Dec. iv, vol. 10, 1903, pp. 297-299, three figures.

Olenellus Thompsoni Hall. *Olenellus* sp.

——— Notes on a series of Trilobites obtained by Mr. Howard Fox from the Devonian of Cant Hill, St. Minver, Cornwall.

Geol. Mag., Dec. v, vol. 2, 1905, pp. 151-154, plate 5.

Phacops latifrons Bronn., *P. granulatus* Münster, *P. (Cryphacops) punctatus* Stein.

——— On a collection of Trilobites from the Upper Cambrian of Shantung, North China.

Geol. Mag., Dec. v, vol. 2, 1905, pp. 211-215—continued on p. 251-255, plate 13.

This article contains an abstract of Herr H. Monke's paper, entitled, "Contributions to the Geology of Shantung—1. Upper Cambrian Trilobites from Yen-tsy-yai," Jahrb. d. k., Preeuss Geol. Landesanstalt and Bergakademie, 1902, vol. 23, pp. 103-151, pl. 3-9.

The author illustrates *Drepanura Premesnili* Bergeron (which, like *D. Ketteleri* Monke, is founded upon pygidia and separate and imperfect head shields, also with elongated cheek-spines. The lateral caudal spines are very much more elongated in *D. Ketteleri* and remind one of the very long lateral cheek and caudal spines of *Bathynotus holopyga* Hall).

Stephanocare Richthofeni Monke, referred to the genus *Olenoides* in the text, p. 254, fig. 2.

WOODWARD (Henry)—Continued

——— Notes on some Crustaceans and two Myriopods from the Lower Coal measures near Colne, Lancashire.

Geol. Mag., Dec. v, vol. 2, 1905, pp. 437-44.

Decapoda: *Macroura Anthrapalaemon serratus* n. sp., *A. Woodwardi* R. Etheridge, *A. Traquairii* ? Peach.

——— Further note on *Cyclus Johnsoni* from the Coal Measures Dudley.

Geol. Mag., Dec. v, vol. 2, 1905, pp. 490-492.

——— Two new species of *Eurypterus* from the Coal Measures Ilkington.

Geol. Mag., Decade v, vol. 4, 1907, pp. 277-282, plate 13.

Eurypterus Moyscvi n. sp., *E. Derbiensis* n. sp.

The author gives a sketch of the Carboniferous Euryptidae.

——— On the genus *Pygocephalus* (Huxley), a primitive Schizopod Crustacean from the Coal Measures.

Geol. Mag., Decade v, vol. 4, 1907, pp. 400-407, plate xviii.

Pygocephalus Cooperi Huxley, *P. (Anthrapalaemon) Parkeri* n. sp., fig. 2, in text.

——— Further notes on the Arthropoda of the British Coal Measures.

Geol. Mag., Decade v, vol. iv, 1907, pp. 539-549.

Bellinurus Baldwinii n. sp., *B. longicaudatus* n. sp.

——— Note on the genus *Hastimima* from Brazil and Cape.

Geol. Mag., Decade v, vol. 6, 1909, pp. 486-88.

——— On a pygidium of *Bronteus* from the Devonian of Gerolstein Eifel, preserved in the collection of the late Mr. Townshend M. Hall, in the Athenaeum, Barnstaple.

Geol. Mag., Decade v, vol. 7, 1910, pp. 407-410, figures.

The author figures *Bronteus Halli* sp. nov., *B. thysanopeltis* Barr., *B. speciosus* Corda.

——— Note on a new species of *Caryocaris* (*C. Kilbridensis*) from the Arenig rocks of the Kilbride Peninsula.

Quart. Jour. Geol. Soc. London, vol. 68, p. 99, 1912.

The species approaches the *Caryocaris wrightii* Salter.

The author notes near the centre of the carapace two round bodies which appear to be eggs, and may possibly be homologous with the pair of ephippial eggs so often observed in *Daphnia*.

WOODWARD (Henry)—Continued

—— The position of the Merostomata.

Geol. Mag., Decade v, No. 7, July, 1913, p. 293, two text figures.

The author gives a sketch of the genus from McCoy's weird restoration of *Pterygotus problematicus*, in fifth edition of Lyell's Manual of Elementary Geology, 1855, p. 420.

Pterygotus Anglicus.

Dithyrocaris Scouleri

Also the further discoveries of *Pterygotus*, made by Robert Slimon in the Geol. Sur. Memoir in 1859, illustrated by 16 plates and text figures.

Salter contributed a restoration of *Pterygotus anglicus* to Murchison's *Siluria*, 1859, edition. He gives only two pairs of appendages to the head. The operculum is placed in front of the mouth, and the lower lip or metastoma is absent.

Dr. Nieszkowski, in his paper on *Eurypterus remipes*, gives restorations of the upper and under sides of *Eurypterus*, showing the appendages of the mouth in situ and the thoracic plates on the under side of the body.

Other restoration of several forms of *Pterygotus* *Stylonurus* *Eurypterus*, without descriptions, are given in David Page's *Advanced Text Book of Geology*, 1859, all more or less correct.

Excellent descriptions and figures of American species of *Eurypterus* and *Pterygotus* are given by James Hall in *Palæont. New York*, vol. 3, pt. 1, pp. 382-419, 80 plates and 10 additional plates, the accuracy of which still remains unchallenged.

Mr. J. W. Salter, in the *Quart. Jour. Geol. Soc.*, 1862 and 1863, contributed descriptions of *Eurypterus* and allied form of *Pterygotus*.

Dr. Henry Woodward figured and described a very complete example of *Slimonia acuminata* in the *Intellectual Observer*, 1863, vol. 4, p. 229; also of *Eurypterus lanceolatus* in the *Geol. Mag.*, 1864, vol. 1, p. 107, pl. 5, figs. 7-9. In 1865 he figured and described *Stylonurus scoticus*, *S. Poweriei*, *S. Symondsi* *Hemiaspis limuloides* in the

WOODWARD (Henry)—Continued

Quart. Jour. Geol. Soc., vol. 21, pp. 482-92, plates 13-14. The same author, in 1866, commenced a Monograph of the British Crustacea of the Order Merostomata, published in the Palæont. Soc., 1866-1878, in which 14 genera and 83 species are recorded, described and illustrated.

The author does not include in this historical sketch the paper by DeKay, 1825, who gave the generic name of *Eurypterus*, or reference to Mitchell's paper in the Am. Monthly Mag., vol. 3, 1888, p. 291, in which he describes the now well-known *Eurypterus remipes* DeKay, as a fossil fish.

Woodward quotes the well-known paper by Dr. Holm, St. Petersburg Academy, 1896, and his investigations of *Eurypterus fischeri* from the Island of Oesel. In this locality the fossils are not metamorphosed into carbonaceous film, as in other deposits, and he was able to elaborate its organization in such detail that *E. fischeri* has really become the most completely known of all extinct animals.

Woodward's paper includes two full-page figures of *Eurypterus fischeri*, from Holm's paper.

The paper closes with a notice of Dr. Clarke and Ruedemann's memoir on the Euryptera of New York, noted in this Bibliography.

——— *Rochdalia Parkeri* by Henry Woodward.

Geol. Mag., Decade v, No. 8, vol. 10, p. 352, 1913.

This new genus and species from the Coal Measures of Rochdale, the author places with the Branchiopoda in the order Anostraca.

Zelizoko (J. V.) Geologisch—paleontologische Verhältnisse der nächsten Umgebung von Rozmítal in Böhmen.

Bull. Acad. Sci. de Bohême, 1906, 2 plates.

Trinuclæus Alfrédi nov. *Dionide formosa* Barr. *Phacops (Chasmops) Bohemicus* nov. *Calymene* sp. *Dalmania* sp.

Zimmermann (Hugo). Trilobiten aus dem devonkalk des Rittberges bei Czellechowitz.

Verhandl. des Naturf. Vereins in Brünn, Bd. xxx, 1891, plate.

Dechenella rittbergensis n. sp., p. 119, pl. 1, fig. 4. Referred by Richter to the subgenus *Eudechenella*.

The author figures and describes *Bronteus alutaceus* Goldf. *Dechenella Ferneuli* Barr. Referred by Richter to *D. Rittbergensis*.

Cyphaspis granulatus Steininger and Proetus sp. Referred by Richter to *Schizoproctus celechovicensis* Smycka.

Zuber (Rudolf). Najdawniejszy świat organiczny i najstarsze formacje osadowe Napisal.

Kosmos polski, vol. 23, 1899, pp. 12-24.

The author illustrates *Olenellus Thompsoni* and *Mesonacis vermontana*.

Figs. 1-12. *Encrinurus sex-costatus*.
Figs. 13-15. *Encrinurus (Cromus)*, *Beaumonti*.
Figs. 16-19. *E. (Cromus) transiens*.

Figs. 20-22. *E. (Cromus) Bohemicus*.
Figs. 23-24. *Encrinurus punctatus*.

Encrinurus punctatus.

Figs. 1-10. *Cryptonymus variolaris*.
 Fig. 11. Linne's fig. of pygidium.
 Fig. 12. Pygidium *Encrinurus multi-segmentatus*.
 Fig. 13. *E. Eagani*.

Fig. 14. *E. obtusus*.
 Fig. 15. *E. ornatus*.
 Fig. 16. *E. laevis*.
 Fig. 17. *Cybele vigilans*.

(The figures copied after Dr. Henry Woodward's plate, Proc. Geol. Soc., vol. 23, 1867.)

Fig. 1. *Belinurus reginae* Baily Coal Measures, Ireland.
 Fig. 2. *Euproops rotundata* Prestwich Coal Measures, Eng.
 Fig. 3. *Hemiaspis linuloides* H. Woodward, Ludlow, Eng.
 Fig. 4. *Buuodes limula* Eichwald Silurian, Baltic.
 Fig. 5. *Pseudoniscus aculeatus* Nieszkowski Sil., Baltic.
 Fig. 6. *Exapinurus Schrenkii* Nieszkowski Silurian, Baltic.
 Fig. 7. *Eurypterus remipes* De Kay Silurian, New York.

(The figures are copied after T. Rupert Jones's plate, Monthly Microscopical Jour., 1870.)

- Fig. 1. *Bairdia curta* McCoy.
 Fig. 2. *Thlipsura corpulenta* Jones & Holl.
 Fig. 3. *Cythere Jukesiana* J. & H.
 Fig. 4. *Cythereella brevis* Jones.
 Fig. 5. *Cythereclina cuspidata* Jones.
 Fig. 6. *Echinina siliquia* J. & H.
 Fig. 7. *Carbonia Agnes* Jones.
 Fig. 8. *Cypridina Phillipsiana* Jones.
 Fig. 9. *Cypridella Koninckiana* Jones.
 Fig. 10. *Cypridella subannulata* Jones.
 Fig. 11. *Entonoconchus Scouleri* McCoy.

- Fig. 12. *Entomis divisa* Jones.
 Fig. 13. *Entomis biconcentrica* Jones.
 Fig. 14. *Primitia renulina* J. & H.
 Fig. 15. *Kirkbya Urei* Jones.
 Fig. 16. *Moorea silurica* J. & H.
 Fig. 17. *Leperditia Balthica* Hisinger.
 Fig. 18. *Isochilina gracilis* Jones.
 Fig. 19. *Beyrichia Wilckeniana* Jones.
 Fig. 20. *Beyrichia Kloedeni* McCoy.
 Fig. 21. *Beyrichia complicata* Salter.
 Fig. 22. *Leaia Leidyi* Lea.
 Fig. 23. *Estheria membranacea* Patch.
 Fig. 24. *Estheria tenella* Jordan.

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