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THREE NEW GENERA OF GIVETIAN AND FRASNIAN  
(DEVONIAN) RHYNCHONELLOID BRACHIOPODS (1),

by Digby J. McLAREN (Ottawa).

(With two plates.)

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INTRODUCTION.

In a forthcoming Bulletin to be published by the Geological Survey of Canada entitled « Middle and Early Upper Devonian Rhynchonelloid Brachiopods from Western Canada », three new genera will be considered in detail, as well as the existing genera *Calvinaria* STAINBROOK 1945, *Ladogia* NALIVKIN 1941, and *Leiorhynchus* HALL 1860. Species of these genera will be described, their occurrences listed, and their significance to the correlation of Western Canadian Devonian rocks considered. The new genera are briefly described below. For two of them the type species is new and these also are diagnosed. The types are deposited with the type collections of the Geological Survey of Canada, in Ottawa.

This paper and the forthcoming Bulletin are complementary to a similar study of Western Canadian Famennian rhynchonelloids by Dr. Paul SARTENAER of the Institut royal des Sciences naturelles de Belgique, and National Research Council Post-Doctorate Research Fellow with the Geological Survey of Canada 1958-1960.

Plaster replicas of type specimens stored in the Geological Survey of Canada type collections have been deposited in the Institut royal des Sciences naturelles de Belgique.

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Genus *Cassidirostrum* new

Type species : *Cassidirostrum pedderi* n. sp.

**Diagnosis.** — Uniplicate rhynchonelloids with inflat brachial valve, inconspicuous fold, and broad flattened tongue. Wholly costate with simple angular costae and V-shaped interspaces; commissure crenulate. Strong dental plates and median septum; hinge plates stout, break up before plane of articulation. Septalium filled by plug of secondary shell material that extends ventrally over crural bases which are deeply enclosed in shell. Crura round proximally, slender, trough-shaped distally.

**Discussion.** — *Nekhoroshevia* BUBLICHENKO 1956 differs in possessing a covered septalium. *Ferganella* NIKIFOROVA 1937 has undivided hinge plates and a « septal process » inside the septalial cavity. *Machae-raria* COOPER 1955 possesses a cardinal process and a median septum. *Obturamentella* AMSDEN 1958 and *Glossinotoechia* HAVLIČEK 1959, although both have septalia plugged with shell material, differ in shell form and other features of their interiors.

The only species referred to *Cassidirostrum* is the type — *C. pedderi* from early late Middle Devonian (early Givetian) of the Anderson River area, Northwest Territories.

The genus is named from the Latin « cassida » a helmet, and « rostrum » a beak.

*Cassidirostrum pedderi* n. sp.

(Plate I, Figures 1-3; Plate II, Figure A.)

1867. *Rhynchonella*, (sp. undt.) MEEK, p. 94, Pl. XIII, figures 10 a, b. Holotype, GSC No. 15,350, and 7 Paratypes, A to G, GSC Nos. 15,351 to 15,357 inclusive.

**Description.** — Medium-sized, sub-pentagonal in outline, greatest width at or forward of mid length, width and length approximately equal; shell strongly costate. Sulcus shallow, begins at mid length, extends into broad vertical to recurved tongue. Beak erect to strongly incurved. Interareas wide and concave; beak ridges prominent. Delthyrium open, deltidial plates small, triangular. Brachial valve high, domed, fold begins forward of mid length, inconspicuous. Costae angular, 5 to 9 on fold, 7 to 12 on each flank, begin at beak, but commonly worn off umbones.

Strong divergent dental plates, wide delthyrial cavity. Teeth moderately strong, outwardly curved. Stout median septum supports septalium to plane of articulation, where hinge-plates break up. Cardinalia heavily invested with secondary shell material in mature shells. Septalium is

filled with a plug which extends over crural bases. Adductor impressions narrow and long.

**Discussion.** — Small specimens resemble the species figured by MEYER (1913) as « *Rhynchonella (Wilsonia) princeps* BARRANDE » from the Middle Devonian of the northern Arctic Islands of Canada. But this form has a deep septalium with a covering plate bearing a stalked Y-shaped cardinal process.

The species is known only from the Anderson River and its tributaries, Northwest Territories, where it occurs in the lower part of the « Middle Ramparts » formation, (basal Hare Indian formation), of early Givetian age.

The species is named for A. E. H. PEDDER of Triad Oil Company Limited, Calgary.

### Genus *Hadorhynchia* new

Type species : *Pugnoides sandersoni* WARREN 1944,

pp. 115-116, Pl. II, figures 5, 6.

**Diagnosis.** — Uniplicate rhynchonelloids with inflate brachial valve, and broad prominent vertical tongue; coarsely costate anteriorly. Lateral commissures raised by dorsal geniculation of ventro-lateral slopes of pedicle valve; anterior commissure depressed by downward bending of fold at front of brachial valve. Strong ridges developed on interspaces between costae on interior of shell at front and lateral margins. Dental plates and median septum developed; septalium filled by broad rounded longitudinal ridges developed on inner part of hinge plates. Crura vertical flattened lamellae, ventrally plunging, with dorsal groove and lateral projection on each external surface anteriorly.

**Discussion.** — *Sphaerirhynchia* COOPER and MUIR-WOOD 1951, differs in general external form and in possessing a « roofed-over cruralium » (Amsden, 1958, p. 95). *Uncinulus* BAYLE 1878, possesses a well-developed cardinal process. *Straelenia* MAILLIEUX 1935, is multicostate with a shallow shell and poorly defined fold, sulcus, and tongue.

The only species referred to *Hadorhynchia* at present is the type — *H. sandersoni*, from beds of late Middle Devonian (Givetian) age of Great Slave Lake and Mackenzie River areas, Northwest Territories, Canada.

The genus is named from the Greek « hadros » stout, strong, and « rhynchos » a beak.

*Hadorrhynchia sandersoni* (WARREN).

(Plate I, Figures 4, 5; Plate II, Figure B.)

1867. *Rhynchonella* — ? MEEK, p. 95, Pl. XV, figure 4.1944. *Pugnoides sandersoni* WARREN, pp. 115-116, Pl. II, figures 5, 6.1956. *Pugnoides sandersoni* WARREN, WARREN and STELCK, Pl. VIII, figures 16-21.

Here chosen as Lectotype : University of Alberta Syntype Dv 853-2.

Genus *Ladogioides* newType species : *Ladogioides pax* n. sp.

**Diagnosis.** — Uniplicate, acuminate rhynchonelloids with inflat brachial valve. Shallow pedicle valve with sulcus extending into prominent, vertical to recurved tongue. Shell covered in close-set, flattened costellae; strong angular costae may develop on anterior part of most shells. Dorsally divergent dental plates; hinge plates flat, divided by narrow, deep, septalium; median septum thin, impersistent. Crura dorsally grooved, becoming trough-shaped and slightly recurved anteriorly.

**Discussion.** — *Ladogia* NALIVKIN 1941, which closely resembles *Ladogioides* externally, differs in possessing dental plates with an inward geniculate bend; ventrally concave hinge plates; wide U-shaped septalium attached to stout median septum that persists far into the shell. The genus *Yunnanella* GRABAU 1923 (as far as it is known internally) differs in possessing a well developed septalium supported by a stout septum that persists forward into the shell forward of the plane of articulation. *Nayunnella* SARTENAER 1961 (= *Yunnanella* GRABAU 1931, non 1923) appears to have a similar interior to *Yunnanella*.

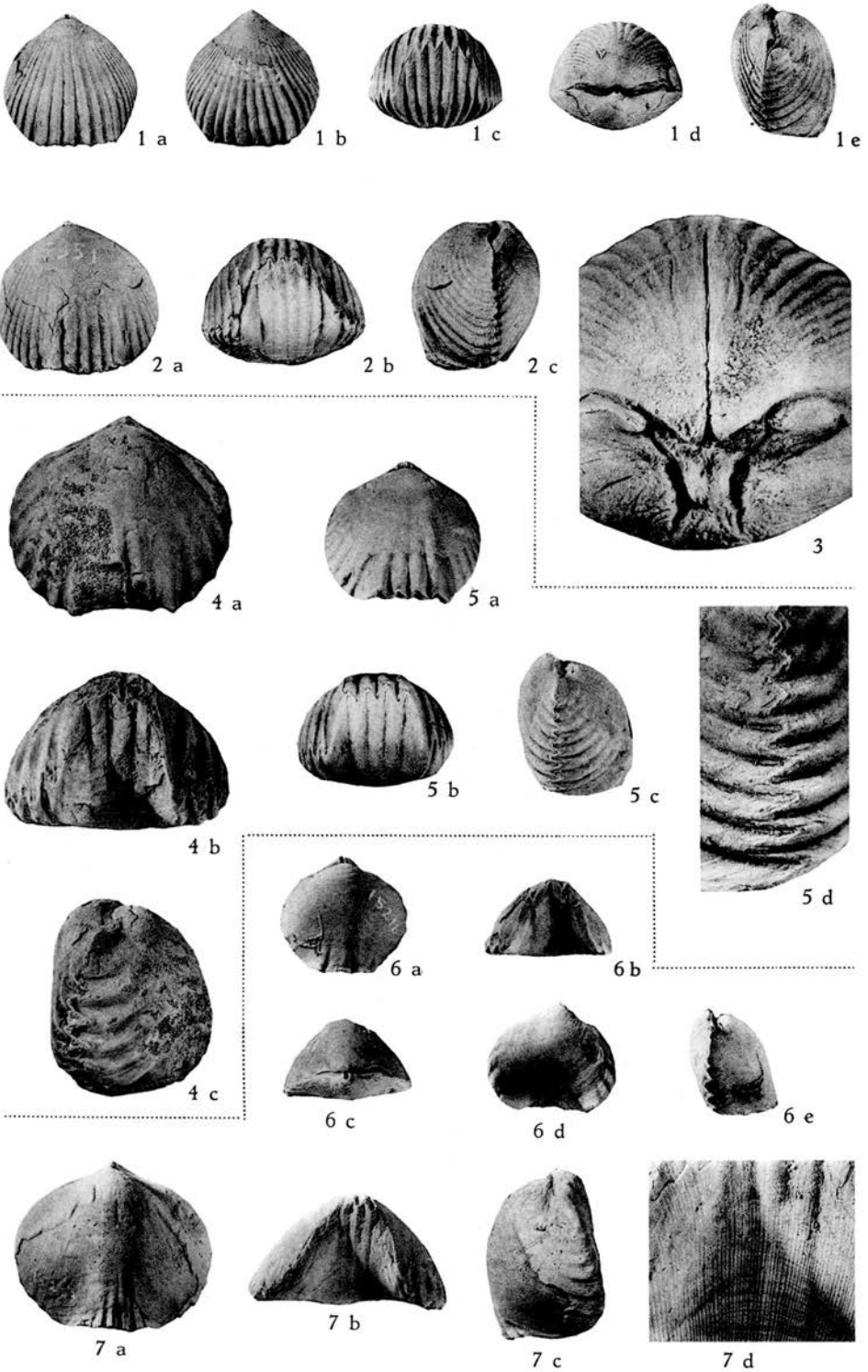
The only species referred to *Ladogioides* are the types species — *L. pax* and *Pugnoides kakwaensis* MCLAREN 1954, both from the earliest Upper Devonian (early Frasnian) of Northern Alberta and Northeast British Columbia.

The genus is named from its resemblance to the genus *Ladogia* NALIVKIN 1941.

*Ladogioides pax* n. sp.

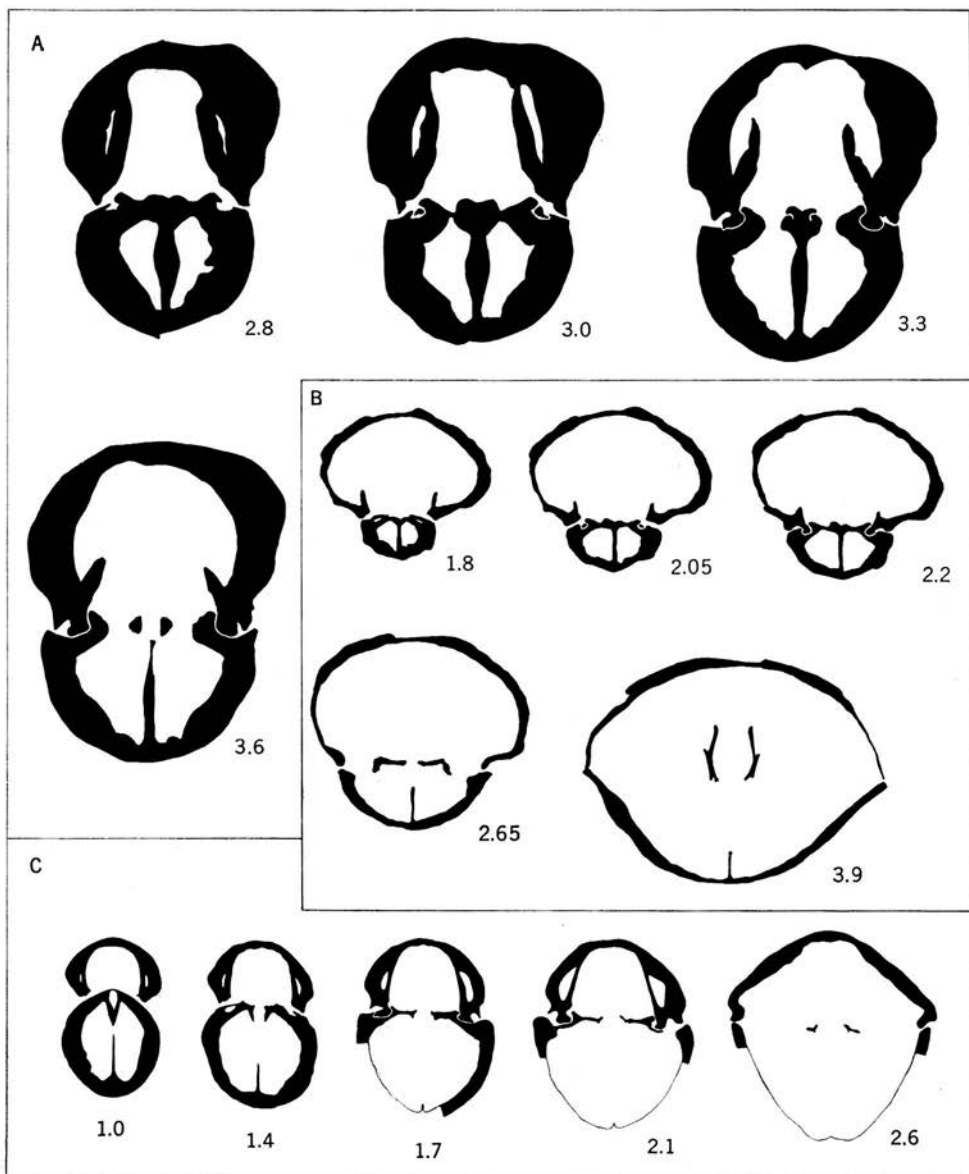
(Plate I, Figures 6, 7; Plate II, Figure C.)

Holotype, GSC No. 15,216, and 11 Paratypes, A to K, GSC Nos. 15,217 to 15,227 inclusive.



D. J. Mc LAREN. — Three new genera of Givetian and Frasnian  
(Devonian) Rhychonelloid Brachiopods.









**Description.** — Medium to large size, sub-elliptical to sub-pentagonal, acuminate; greatest width at or forward of mid length; greatest thickness at front margin; brachial valve deeper than pedicle valve. Sulcus shallow, beginning posterior to mid length extending into prominent tongue, vertical to recurved, ending in acuminate crest. Beak straight to erect; interareas narrow; beak ridges present. Foramen large, hypothyrid to sub-mesothyrid. Deltidial plates small, not in contact. Brachial valve high, acuminate fold inconspicuous, not differentiated from lateral slopes. Ornament of flattened costellae over whole shell, that increase by bifurcation; angular costae appear on most shells towards front margins, — 3 to 6 on fold, 3 to 5 on each flank; some shells without costae.

Widely spaced, dorsally divergent dental plates support teeth up to articulation. Flat, divided hinge plates are separated posteriorly by deep septalium, supported proximally by slender median septum, that does not persist forwards. Crura develop from inner margins of hinge plates; they are small, slender and dorsally grooved.

**Discussion.** — The species bears a superficial resemblance to many «*Pugnoides*»-like rynchonelloids common at higher horizons in the Upper Devonian, but may be readily separated on external morphology, including beak characteristics and micro-ornament.

The species is abundant in the Peace Point member of the Waterways formation that outcrops in the vicinity of Gypsum Cliffs on Peace River, Alberta, and in the stratigraphically equivalent Firebag member of the Waterways formation on Clearwater River, Alberta. It is also known elsewhere from surface and subsurface occurrences in northern Alberta from rocks of early Upper Devonian (early Frasnian) age.

The species is named from the Latin «*pax*» peace, for Peace River, Alberta.

#### ABSTRACT.

Two new Givetian genera are proposed : *Cassidirostrum* with type species *C. pedderi* n. sp., and *Hadorrhynchia* with type species *Pugnoides sandersoni* WARREN, and one new Frasnian genus : *Ladogioides* with type species *L. pax* n. sp. All are from the Devonian of Western Canada.

#### RÉSUMÉ.

Deux nouveaux genres givetiens sont proposés : *Cassidirostrum* et *Hadorrhynchia* avec, respectivement, *Cassidirostrum pedderi* n. sp. et *Pugnoides sandersoni* WARREN comme espèces-type. Un nouveau genre frasnien est introduit : *Ladogioides* avec *L. pax* n. sp. comme espèce-type. Les trois genres sont issus du Dévonien du Canada occidental.

## REFERAT.

Tri novykh roda jivetskikh i franskikh (devonskikh) rinkhonelloidnykh brachiopod. — Predlagaioutsia dva novykh jivetskikh roda : *Cassidirostrum* s tipitchnym vidom *C. pedderi* n. sp. i *Hadrorhynchia* s tipitchnym vidom *Pugnoides sandersoni* WARREN, i odin novyi franskii rod : *Ladogioides* s tipitchnym vidom *L. pax* n. sp. Vse oni proiskhodiat iz devona zapadnoi Kanady.

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GEOLOGICAL SURVEY OF CANADA.

## EXPLANATION OF PLATES.

## PLATE I.

(Except where otherwise stated, all figures are natural size.)

Fig. 1-3. — *Cassidirostrum pedderi* n. sp.

1a-e, dorsal, ventral, anterior, posterior and side views of Holotype, GSC No. 15,350; calcareous shale and shaly limestone in the upper 15 feet of the Hare Indian formation, Anderson River, between latitude 68°28' and 68°32' and longitude 127°04' and 127°24', Northwest Territories. GSC locality 41,319; collector A. E. H. PEDDER, Triad Oil Company Limited, 1959.

2a-c, dorsal, anterior, and side views of Paratype A, GSC No. 15,351; «Interbedded shale and nodular limestone, Lower Ramparts formation», Andrew River, latitude 68°20', longitude 128°56', Northwest Territories, GSC locality 41,327; collector G. V. LLOYD, J. C. SPROULE and Associates, 1959.

3a, posterior view of infernal mould X3, of Paratype E, GSC No. 15,355; same horizon and locality as Holotype.

Fig. 4-5.— *Hadorhynchia sandersoni* (WARREN).

4a-c, dorsal, anterior and side views of Lectotype, University of Alberta No. Dv. 853-2, «Beavertail Formation at Carcajou Rock, below Norman Wells», Northwest Territories.

5a-c, dorsal anterior and side views, and 5d, detail of side view to show ridges on interior of interspaces between costae on each side of lateral commissure X3, of Hypotype C, GSC No. 15,333; from black bituminous limestones of the Pine Point formation, half a mile west of Pine Point, south shore of Great Slave Lake, Northwest Territories; GSC locality 5,675; collectors E. J. WHITTAKER and E. M. KINDLE, 1917.

Fig. 6-7. — *Ladogioides pax* n.sp.

6a-e, dorsal, anterior, posterior, ventral and side views of Holotype, GSC No. 15,216; Peace Point member of Waterways formation; sink hole filling, in brecciated Slave Point formation, Gypsum Cliffs, north bank of Peace River, 1.1 mile east northeast of east end of island just below Boyer Rapids, 24 to 30 feet above water level, Alberta; GSC locality No. 29,157; collector A. W. NORRIS, 1956.

7a-c, dorsal, anterior and side views, and 7d, detail of anterior view to show ornament on tongue X3, of Paratype C, GSC No. 15,219; Peace Point member of Waterways formation; sink hole filling in Slave Point formation, Gypsum Cliffs, north bank of Peace River, opposite unnamed island immediately below Boyer Rapids, Alberta; GSC locality 29,432; collector A. W. NORRIS, 1956.

## PLATE II.

Camera lucida drawings of serial transverse sections X3; distances are in mm forward from the crest of the umbo.

- A. *Cassidirostrum pedderi* n. sp.
- B. *Hadorhynchia sandersoni* (WARREN).
- C. *Ladogioides pax* n. sp.

