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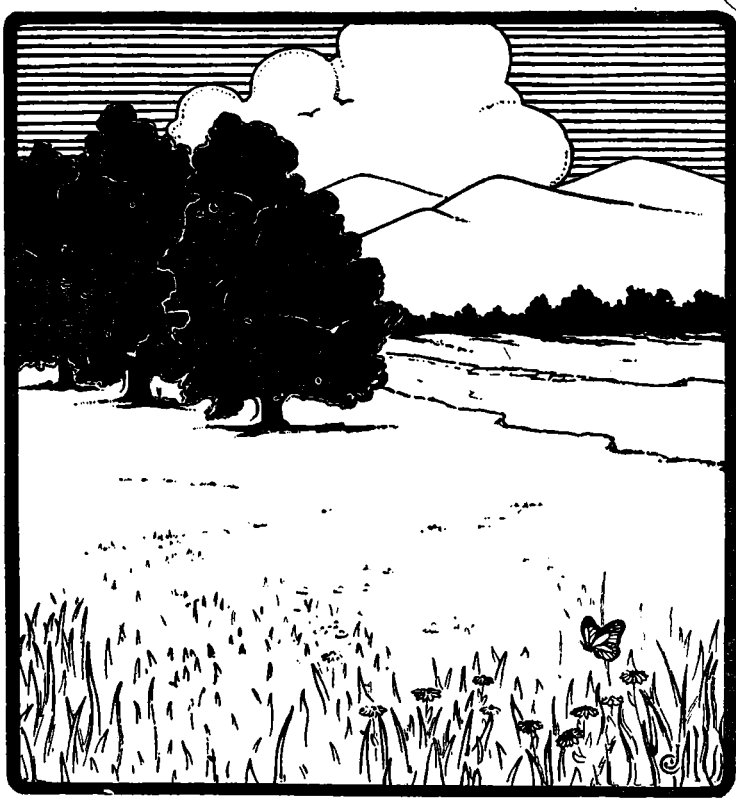

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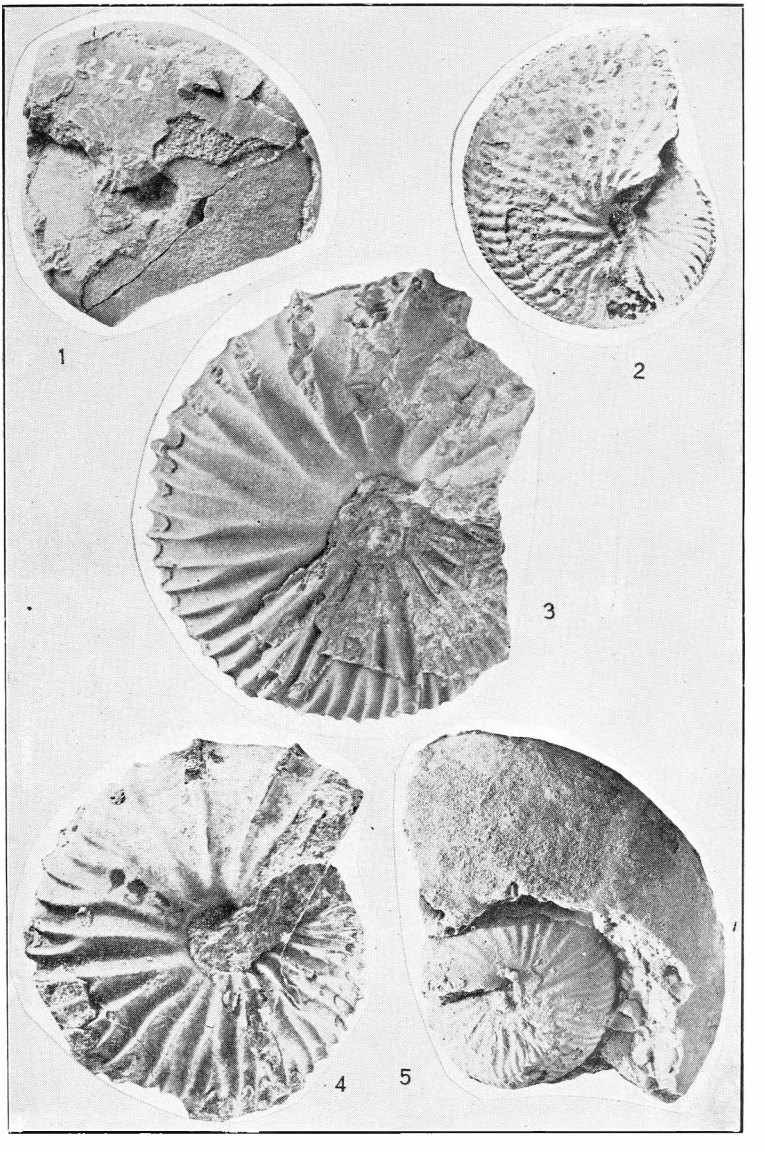

PLATE I

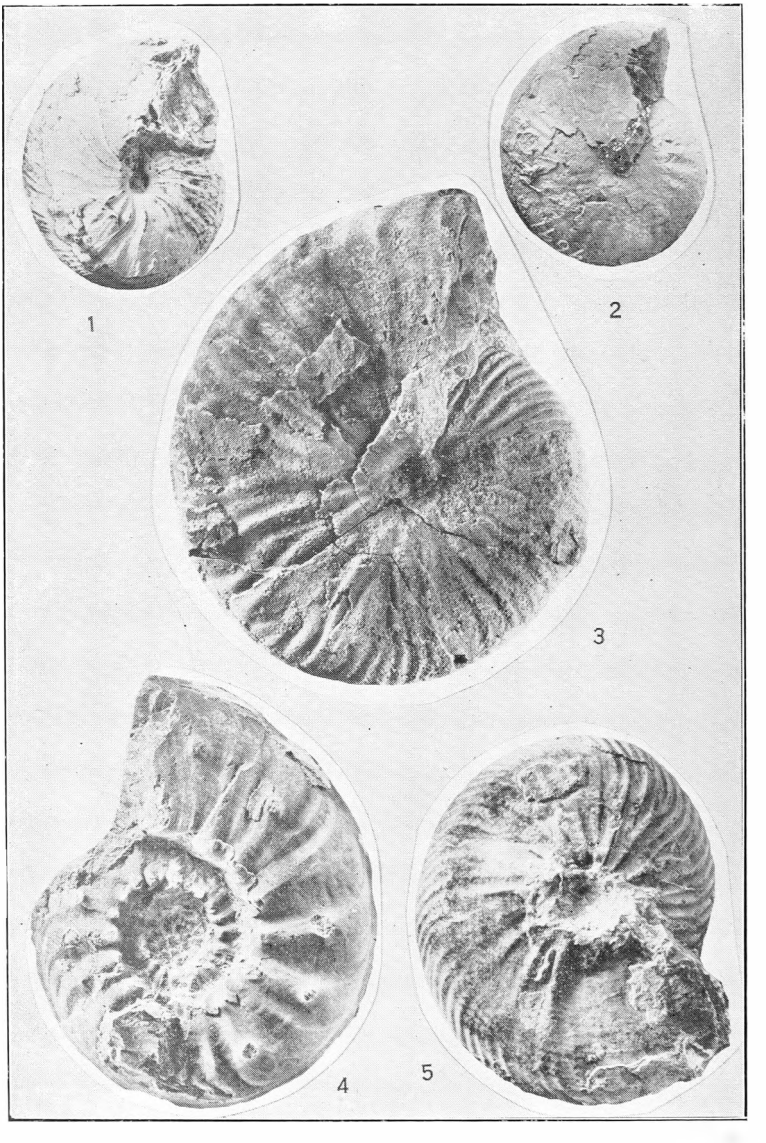

PLATE II.

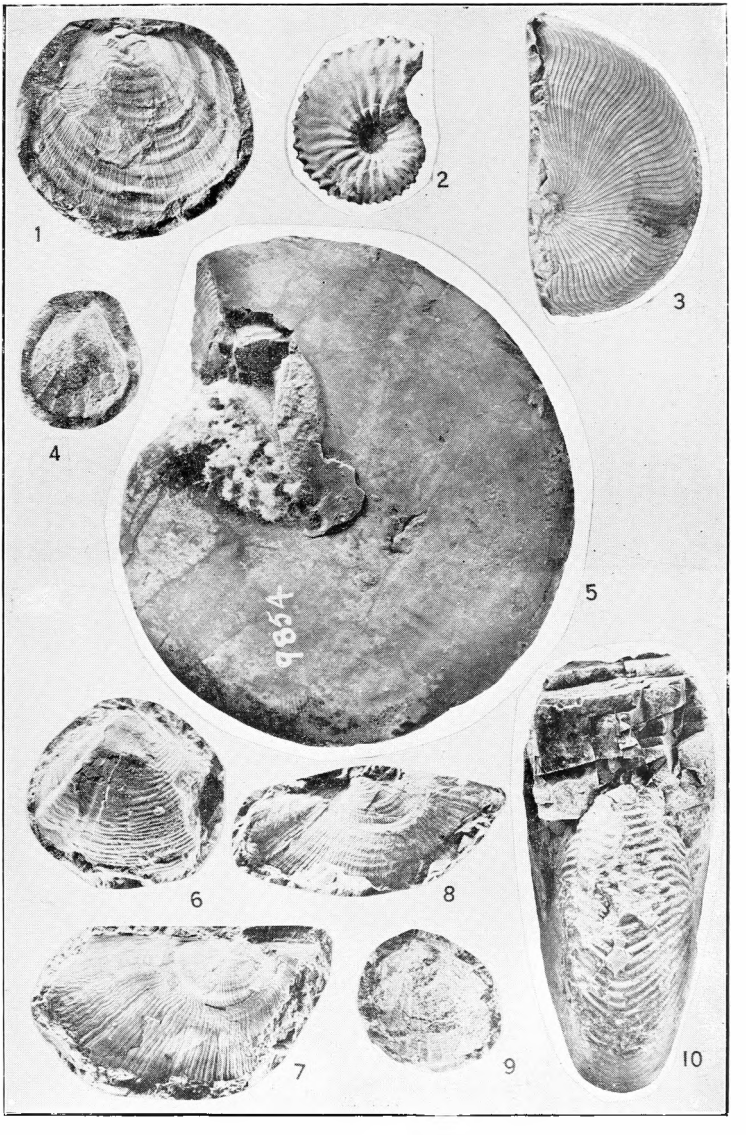

PLATE III

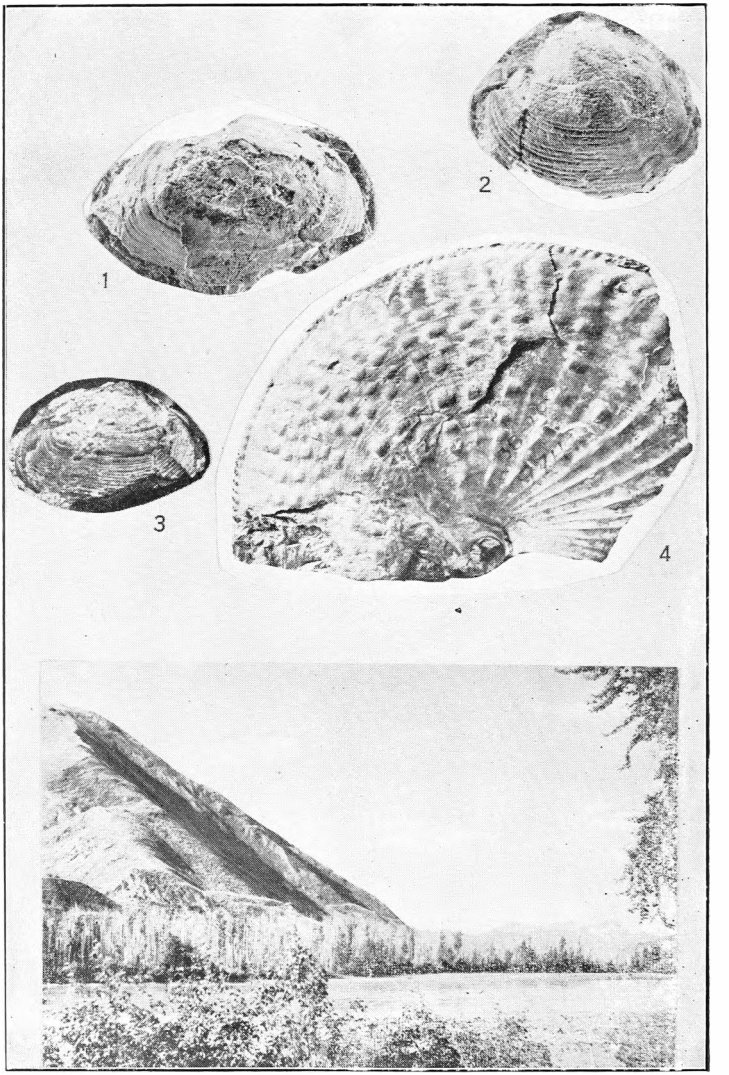

PLATE IV

The Canadian Field-Naturalist

VOL. LIV OTTAWA, CANADA, NOVEMBER, 1940 No. 8

PRELIMINARY STUDY OF SOME TRIASSIC PELECYPODS AND AMMONOIDS FROM THE PEACE RIVER FOOTHILLS, B.C.[1]

By F. H. McLEARN

PRELIMINARY descriptions of twenty new species and varieties of Triassic pelecypods and ammonoids from the Peace River foothills, B.C., are given in the following pages. It is hoped that a more adequate treatment, including additional illustrations, will follow in later papers or in a monograph on the Peace River Triassic.

All types cited are in the collections of the Geological Survey at Ottawa.

Halobia pacalis n. sp.

Plate III, figures 7, 8

The outline is somewhat oblique and about as high as long to somewhat longer than high. The beaks are somewhat in advance of the middle of the long hingeline. The large anterior ear is definitely delimited and flatly arched, except along the dorsal margin where it is low and flat. The surface of the umbonal part of the shell is covered with fine, radiating costae, beyond which in most specimens the costae are deflected and then resume a radiating direction, resulting in a zig-zag pattern. Beyond and on the greater part of the shell are radiating, fine and wavy or crinkly costae, mostly finer and less distinct on the posterior part and less crinkly, but fine, on the anterior part. In some specimens there is a narrow, smooth area along the dorsal margin, posterior to the beak. The median part of the anterior ear has curved varices of growth and the upper and lower parts have straight, fine, radial costae. There is considerable variation in fineness of ornament.

Halobia superbescens Kittl is smaller, has yet finer ornament and has a posterior, triangular area demarcated from the remainder of the shell. *Halobia comata* Bittner is not accurately figured and the type specimen is imperfect; it does not appear to have the zig-zag ornament and may have coarser ornament.

The species *Halobia praesuperba* Kittl, *H. cordillerana* Smith and *H. ornatissima* Smith, have the zig-zag ornament and the fine and crinkly ornament on the middle and posterior parts of the shell. They do not, however, have this ornament also on the anterior part of the body of the shell as in the Peace River specimens, but have there, instead, coarse, straight, radical costæ. It is interesting to note that in some Peace River specimens having coarser costae, they are straight just under the anterior ear, but are always much finer there and occupy a smaller part of the surface than in *H. praesuperba*, *H. cordillerana* or *H.ornatissima*. The close relation of the Peace River shell to this group of species, however, is manifest.

All these species are very variable and some, including our own, should have, possibly, in a broader view, only the status of varieties.

In a previous paper this species has been listed as *Halobia* cf. *superbescens* Kittl.

Name. *Pacalis*, betokening peace.

Types. The holotype, cat. No. 8804, is from Pardonet hill and the paratype, cat. No. 8800, is from Twin Spruce gully, West Brown spur.

Halobia symmetrica var. *lata* n. var.

Plate III, figure 1.

In general proportions and ornament this variety resembles *Halobia symmetrica* Smith very closely. The proportions in the umbonal part of the shell, however, as indicated by the course of growth lines and undulations there, are different. In the typical species the outline at this stage is about as high as long, but in the variety *lata* it is longer than high and the beaks are considerably in advance of the middle of the hinge-

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line. In the growth of the shell of this variety the outline advances from longer than high to about as high as long and the beaks change in position from considerably in advance of the middle to nearly central.

Some right valves are quite convex, particularly in the umbonal region.

Name. *Latus*, wide

Type. The holotype, cat. no. 8809, is from the Halobia zone, Twin Spruce gully.

Myophoria silentiana McLearn

Plate IV, figures 1 to 3

1939. *Myophoria silentiana* McLearn, *Can. Field-Nat.*, vol. 53, Nov. 1939, p. 118, pl. 1, fig. 2.

The holotype is compressed, due partly to distortion but mostly to a poor development of what may be called the lower radial fold on the post-umbonal slope. An upper radial fold is better defined.

A variety to which the name *schooleri* is given, is more convex because of a more prominent "lower radial fold" which swells out all of the posterior part of the shell and demarcates a wide area between it and the dorsal margin. This area is convex because of a broadly rounded "upper radial fold". On the holotype of this variety the wavy costae show in the shallow sulcus in front of the post-umbal slope and there are some shallow varices of growth.

In var. *placida* n. var. (*placidus*, peaceful) there are two rather faint, radial costae, one near the middle and one at the anterior border of the sulcus.

There is also variation in the number and depth of the varices of growth. A few specimens are almost free from them and on these the ornament is more regular and even. Another variation is in the depth of the sulcus. These differences however cannot be recognized in separate varieties. Indeed this is a very variable species and the use of the names proposed above may not prove desirable after experience with larger collections.

The wavy costation in the sulcus is very characteristic of this species. The costae, but usually not the varices of growth, tend to weaken in the sulcus.

Types. The holotype, cat. no. 8758, of the species, the holotype, cat. no. 8810, of the var. *schooleri*, and the holotype, cat. no. 8812 of var. *placida*, are from the *poyana* zone on the Dry Canyon shoulder.

Myophoria morigera n. sp.

Plate III, figure 6

The shell is moderately convex and a little longer than high. The beak is nearly central. The surface on the post-umbonal slope is abruptly infolded to form a bevelled edge, above which there is a convex area divided by a small, very narrow, thread-like, radial groove. There is a broad, very shallow, radial sulcus in front of the post-umbonal slope. Fine, fairly even, concentric costæ cover all the anterior part of the shell and continue posteriorly, on the ventral part of the shell almost to the post-umbonal bevelled edge They are slightly wavy in the shallow sulcus. There are two, low, radial costae in the sulcus. Height of holotype, 26mm.; length, 30 + mm.

Myophoria silentiana McLaren lacks the bevelled edge on the post-umbonal slope, has the costae more wavy in the shallow sulcus and has radial costae only in the variety *placida*.

Name. *Morigerus*, pleasing.

Type. The holotype, cat. no. 8813, is from the *poyana* zone on the Dry Canyon shoulder.

'Pecten'? dishinni n. sp.

Plate III, figure 4

Shell fairly convex, about acline in the lack of any appreciable obliquity, mostly about as long as high, with fairly long hingeline, well rounded ventral margin and comparatively large ears. The "right" ear is separated from the body of the shell by a well defined, auricular sulcus and a variably, but mostly abruptly, rounded, umbonal fold; the "left" auricular sulcus is not so well defined as the "right" and the "left" ear is only obscurely delimited. The body of the shell is covered with 8 or 9, radial, widely spaced ribs of variable strength. The ears are ornamented only with varices of growth. Height of holotype, 18.0 mm.; length, 17.0 mm.

Eumorphotis nationalis Smith has relatively smaller ears and many more and finer, radial costae.

Name. *Dishinni*, semi-mythical enemies of the Sekani.

Type. The holotype, cat. no. 8815, is from talus of the *poyana* zone on the Dry Canyon shoulder.

'Pecten'? dishinni var. *kaska* n. var.

Plate III, figure 9

Compared with the species, this variety has more radial costae, due to additional intercalated, radial costae arising at a stage of growth

corresponding to a height of about 12 mm. Height of holotype, 21.0 mm.; length, 19.0 mm.

Name. Kaska, an Indian tribe.

Type. The holotype, cat. no. 8814, is from the *poyana* zone on Kerr spur.

Juvavites concretus n. sp.

Plate I, figures 3, 4

This is a fairly large, fairly involute species, with stout, rounded whorls, about as high as thick, and rounded, umbilical shoulder. The coarse, elevated ribs are curved a little on the sides and somewhat arcuate on the venter. The ribs variably divide near the umbilicus and near the middle of the sides, forming groups of two, three or four ribs. At the anterior end of the last whorl there is a second and variable stage of ribbing where ribs are widely spaced and are single due to loss of bifurcation or decline and atrophy of one branch. In the holotype widely spaced, single ribs are present beyond a growth stage of 58 mm. In the paratype wide spacing of the ribs begins at 66 mm. and the ornament approaches a single rib stage by decline in strength of one branch each of the bifurcated ribs. There is thus variation in the stage at which the second style of ribbing appears, some variation in that style and there is also variation in the size and proportions of whorls.

Compared with *Juvavites magnus* McLearn, the whorls are stouter and thicker.

Name. *Concretus*, gross.

Tyes. The holotype, cat. no. 8818, and the paratype, cat. no. 8819, are from the *Halobia* zone on West Brown spur.

Juvavites mclayi n. sp.

Plate III, figure 10

This is a rather compressed, involute species with much higher than thick whorls, almost flattened, somewhat convergent sides, convex venter and rounded, but well defined, ventral shoulders. There are numerous, fine, even, rounded costae, nearly straight on the sides, but arcuate on the venter, continuous across the venter on the shell and mostly so on the core. The costae are broad and of low relief on the anterior part of the living chamber.

Compared with *Juvavites (Anatomites) laevicostatus* Mojsisovics, our species is larger, has more even costation, better defined ventral shoulders and, apparently, no constrictions. Compared with *Juvavites angulatus* Diener, it is more involute, has blunter ribbing and the ribs on the venter form a more obtuse angle.

Name. In honour of A. B. McLay.

Type. The holotype, cat. no. 8792, is from the *Halobia* zone at the west end of McLay spur.

Juvavites selwyni n. sp.

Plate II, figure 3

This is a fairly compressed, involute species with rounded, umbilical shoulder. Near the anterior end of the living chamber the venter broadens and flattens and rounded, ventral shoulders are formed. There are two stages of ornament. The posterior half of the ultimate whorl has nearly straight, rounded ribs curved forward a little near the venter. Most ribs divide just outside the umbilical shoulder and again on the outer part of the sides. On the anterior part of the ultimate whorl the ribbing is not so even; strong ribs alternate with low, indistinct ones and are slightly convex forward on the sides and only bent forward a little on the ventral shoulder. In addition two rows of indistinct tubercles appear near the outer ends of the ribs. The ribbing is not continuous across the venter, but, at maturity, several shallow furrows cross it.

Compared with *Juvavites subinterruptus* Mojsisovics and *Juvavites kellyi* Smith the whorls are more compressed, the venter broadens and flattens at the anterior end and faint tubercles are present. In *Juvavites chamissoi* Mojsisovics the ribbing disappears at maturity and the tubercles are larger and more distinct.

Name. The species is named for A.R.C. Selwyn.

Type. The holotype, cat. no. 8820, is in the *Halobia* zone on *Juvavites* gully, Pardonet hill.

Juvavites custi n. sp.

Plate II, figure 2

This is an involute, species with variably stout, slightly higher than thick whorls, flattened to gently convex sides, rounded to almost flattened venter, rounded, ventral shoulders, deep, steep-walled umbilicus and rounded, umbilical shoulder. On the posterior part of the ultimate whorl of the holotype are small, low, distant costae, nearly straight on the sides, but curved forward somewhat on the ventral shoulder. The surface is nearly smooth in the anterior part of the same whorl, except for some inconspicuous, faint, irregular, radial ornament. The fairly long lobes and deep saddles of the suture line are moderately indented.

The whorls are somewhat stouter, the venter wider and more flattened, and the ribs are coarser, more irregular and more distant than in *Juvavites bococki* McLearn.

Name. The name is given for an early Trader in the Peace River foothills.

Type. The holotype, cat. no. 8821, is in the talus of the *Halobia* zone, just east of *Juvavites* gully, Pardonet hill.

Juvavites (*Gonionotites*) *rarus* n. sp.

Plate III, figure 5

The shell is very compressed and extremely involute. The venter widens and is nearly flat at maturity. From what remains of the shell and from the core, it is inferred that the surface of the later whorls is almost smooth, there being nothing more than indistinct ridges and shallow varices of growth. What appear to be specimens of the early whorls have a very fine, almost striate ornament. The low saddles and short lobes are moderately denticulate.

The inner whorls of *Gonionotites discus* Gemmellaro, have stronger and coarser ribbing and the saddles are higher and the lobes longer in the suture line. The ornament on the last whorl of *Gonionotites haugi* Gemmellaro is more pronounced and the suture line has more and somewhat higher saddles.

Gonionotites vincentii Gemmellaro has a much more pronounced sculpture on the inner whorls and fewer saddles in the suture line. The venter of *Gonionotites irmintrudis* Diener widens at a much later stage of growth, if at all. The suture line of this species is not available for comparison.

Name. *Rarus*, thin.

Type. The holotype, cat. no. 8833, is from the *Halobia* zone on the west slope of West Brown spur.

Juvavites (*Gonionotites*) *fuscus* n. sp.

Plate I, figure 1.

The whorls are much higher than thick, have nearly flattened, convergent sides and narrow, rounded venter. The umbilicus is fairly small and the umbilical shoulder is abruptly rounded and almost angular. The core is nearly smooth, having only very faint, irregular ribs or undulations, nearly straight on the sides and curved forward near and on the venter. The short lobes and low saddles are modified by short denticulations. There is some variation in the degree of compression and in the width of the umbilicus.

The sides of the whorl are more flattened, the umbilicus wider and the umbilical shoulder more angular than in *J.* (*Gonionotites*) *rarus*.

Name. *Fuscus*, brown.

Type. The holotype, cat. no. 8835, is from talus of the *Halobia* zone on the west slope of West Brown spur.

Juvavites (*Gonionotites*) *belli* n. sp.

Plate I, figure 5.

The penultimate whorl is fairly thick, has a broadly rounded venter and numerous costae, bent forward a little at the venter. The ultimate or outermost whorl preserved is compressed, has a narrowly rounded venter, converging sides and is smooth. The two known specimens are probably not mature or the anterior end is broken off.

The outermost whorl is more compressed and the penultimate whorl has coarser ribbing than *Gonionotites mauvolicoi* Gemmellaro. The costation of the inner whorls is somewhat coarser than in *Gonionotites noricus* Diener. The inner whorls are thicker than those of *Gonionotites waldthauseniae* Welter. The compression of the shell is greater than in *Gonionotites hyatti* Smith, the ribbing is stronger on the inner whorls, there is no ventral ridge and the ultimate whorl is smoother.

Name. In honour of A. H. Bell.

Type. The holotype, cat. no. 8834, is from talus of the *Halobia* zone on the west slope of West Brown spur.

Juvavites (*Malayites*) *butleri* n. sp.

Plate II, figure 5.

This is a compressed, fairly involute species. The whorl is much higher than thick, the sides almost flattened and convergent, the venter narrow and rounded and the umbilical shoulder well defined and rounded. The ribs are numerous, low, nearly straight on the inner part of the sides, curved forward near the venter and moderately spaced on the sides, but closer on and near the venter where extra ribs are introduced by intercalation and bifurcation. There is also fine strigation.

The ribbing is coarser, the shell is more compressed and the umbilicus larger than in *Malayites brouweri* Pakuckas. The shell is more compressed and the umbilicus is wider than in *Malayites indo-malayicus* Welter. The ribbing is better defined and coarser than in *J.* (*Malayites*) *dawsoni* McLearn.

Name. The name is given for Captain W. F. Butler, who ascended the Peace River in 1873.

Type. The holotype, cat. no. 8840, is from talus of the *Halobia* zone on the west slope of West Brown spur.

Juvavites (Malayites) parcus n. sp.
Plate II, figure 1.

This is a fairly, but variably, compressed, involute species with slightly convex, convergent sides, narrowly rounded venter, narrow umbilicus and well rounded, umbilical shoulder. There are low, irregularly shaped, rather distantly and unevenly spaced ribs, stronger on the inner part of the sides and becoming fainter and smaller, dividing and becoming more numerous and closely spaced near the venter. The ribs are bent backward near the umbilicus, are nearly straight on the middle of the sides and are bent forward a little near the venter. There is considerable variation in strength, form and spacing of ribs. There is fine and, in places, very fine strigation. The variably high saddles and long lobes are moderately indented.

The strigation is finer and fainter than in *J. (Malayites) dawsoni* McLearn. The ribbing is less well defined and more unevenly spaced than in *J. (Malayites) butleri* n. sp. and the strigation is finer. Compared with *Sagenites inermis* var. *striatus* Mojsisovics, the ribbing and strigation are weaker and there are more numerous and more closely spaced ribs on the venter, which are curved forward a little and there are more elements in the suture line.

Name. *Parcus*, frugal.

Type. The holotype, cat. no. 8843, is from talus of the *Halobia* zone on Pardonet hill, just West of Juvavites gully.

Sirenites pardoneti n. sp.
Plate I, figure 2, Plate IV, figure 4.

In this compressed, involute species the sides of the whorl are gently convex to almost flat and converge to a narrow venter on which there is a narrow furrow, bordered by low, narrow "keels". The very small umbilicus has a high, steep wall and an abruptly rounded, umbilical shoulder. The sides have broad, low ribs, somewhat convex forward on the middle of the sides and are bent forward at their ventral ends. The low ribs bear rather wide low, rather irregular tubercles of which there are about 8 to 11 spiral rows. The ventral "keels" bear short, narrow ribs set at an angle to the venter, which gives it a corded or plaited appearance. In mature specimens the ribs decline in strength. At the very end of large and mature specimens, the ornament becomes irregular, the tubercles become farther apart in radial rows and finally there are very slender ribs with small bullae. This is a very variable species and many specimens have finer ribs and smaller tubercles than the holotype. There is also variation in the stage of growth at which the finely ribbed-bullate ornament appears.

This species is very close to *Sirenites alixis* Diener and may be only a variety of it. The coarser presence of bullae at the anterior end seem to distinguish it. The ornament is coarser than that of the Indian figured specimen of *Sirenites elegantiformis* Diener. It resembles an unnamed Indian shell, labelled *Sirenites* aff. *vredenburgi* by Diener.

In previous papers this species has been listed as *Sirenites* cf. *elegantiformis* Diener.

Name. The name is given for Jacques Pardonet, trapper and miner.

Types. The holotype, cat. no. 8844, and paratype, cat. no. 8845 are from the *Halobia* zone on Black Bear ridge.

Pterotoceras caurinum var. *arctum* n. var.
Plate III, figure 2.

This variety differs from the species in the flatter sides, the greater compression of the shell and the narrower umbilicus. The ribs number about forty, have the least relief on the middle of the sides, end dorsally in small, not very well defined bullae, and end ventrally in somewhat pointed clavae, which border the venter.

Name. *Arctus*, narrow.

Type. The holotype, cat. no. 8846, is from the *Halobia* zone on the west slope of West Brown spur.

Himavatites canadensis n. sp.
Plate III, figure 3.

This is a compressed, involute species with gently convex, almost flattened sides, almost flat venter,, angular, ventral shoulders, narrow umbilicus and gently rounded, umbilical shoulders. On the sides are flat band-like, narrow, somewhat imbricating ribs which are convex anteriorly on the sides and bent forward near the ventral shoulder. Several rows of very small and faint tubercles are present on the sides of whorl. Each flat rib ends on the ventral shoulder in a very small, denticulate clavus, the two denticles of which are small, irregular and poorly defined. Outside this row of clavi and bordering the almost flat, almost smooth, narrow venter is a

row of small tubercles or denticles, mostly corresponding in size and number to the denticles on the clavi of the ventral shoulder.

This species differs from *Himavatites columbianus* in many features, including lack of enlarged clavi or ears and lack of large lateral spines.

Type. The holotype, cat. no. 8847, is from talus of the *Halobia* zone on the west slope of West Brown spur.

Distichites gethingi n. sp.

Plate II, figure 4.

This is a moderately evolute, compressed species with convergent, almost flattened whorl sides, definite, but rounded, ventral shoulders, narrow venter, very narrow, ventral furrow, relatively high, but small, bordering keels, rounded, umbilical shoulder and a wide umbilicus. There is a row of short spines on the umbilical shoulder and a row of longer spines on the side of the whorl. Fairly strong, but low, ribs are straight between the spines and curved strongly forward on the ventral shoulder. On the anterior half of the last whorl of the holotype, the strong ribs with lateral spines are widely spaced and are separated by one or more weak ribs without lateral spines.

Compared with *Distichites pudens* var. *fatuensis* Welter, the ventral shoulders are better defined, the sides of the whorl are more flattened and there is a more pronounced alternating ornament of stronger ribs with spines and weaker ribs without spines.

Name. Named for the Gething family of Hudsons Hope.

Type. The holotype, cat. no. 8849, is from talus of the *Halobia* zone on Black Bear ridge.

DESCRIPTION OF PLATES

PLATE I

Figure 1. *Juvavites* (*Gonionotites*) Fuscus n. sp. Holotype. Geol. Surv. colls., cat. no. 8835.

Figure 2. *Sirenites pardoneti* n. sp. Paratype. Geol. Surv. colls., cat. no. 8845.

Figure 3. *Juvavites concretus* n. sp. Paratype. Geol. Surv. colls., cat. no. 8819.

Figure 4. *Juvavites concretus* n. sp. Holotype. Geol. Surv. colls., cat. no. 8818.

Figure 5. *Juvavites* (*Gonionotites*) *belli* n. sp. Holotype. Geol. Surv. colls., cat. no. 8834.

PLATE II

Figure 1. *Juvavites* (*Malayites*) *parcus* n. sp. Holotype. Geol. Surv. colls., cat. no. 8843.

Figure 2. *Juvavites custi* n. sp. Holotype. Geol. Surv. colls., cat. no. 8821.

Figure 3. *Juvavites selwyni* n. sp. Holotype. Geol. Surv. colls., cat. no. 8820.

Figure 4. *Distichites gethingi* n. sp. Holotype. Geol. Surv. colls., cat. no. 8849.

Figure 5. *Juavvites* (*Malayites*) *butleri* n. sp. Holotype. Geol., Surv. colls., cat. no. 8840.

PLATE III

Figure 1. *Halobia symmetrica* var. *lata* n. var. Holotype. Geol. Surv. colls., cat. no. 8809.

Figure 2. *Pterotoceras caurinum* var. *arctum* n. var. Holotype. Geol. Surv. colls., cat. no. 8846.

Figure 3. *Himavatites canadensis* n. sp. Holotype. Geol. Surv. colls., cat. no. 8847.

Figure 4. *'Pecten'? dishinni* n. sp. Holotype. Geol. Surv. colls., cat. no. 8815.

Figure 5. *Juvavites* (*Malayites*) *butleri* n. sp. Holotype. Geol. Surv. colls., cat. no. 8833.

Figure 6. *Myophoria morigera* n. sp. Holotype. Geol. Surv. colls., cat. no. 8813.

Figure 7. *Halobia pacalis* n. sp. Paratype. Geol. Surv. colls., cat. no. 8800.

Figure 8. *Halobia pacalis* n. sp. Holotype. Geol. Surv. colls., cat. no. 8804.

Figure 9. *'Pecten'? dishinni* var. *kaska* n. var. Holotype. Geol. Surv. colls., cat. no. 8814.

Figure 10. *Juvavites mclayi* n. sp. Holotype. Geol. Surv. colls., cat. no. 8792.

PLATE IV

Figure 1. *Myophoria silentiana* var. *schooleri* n. var. Holotype. Geol. Surv. colls., cat. no. 8810.

Figure 2. *Myophoria silentiana* var. *placida* n. var. Holotype. Geol. Surv. colls., cat. no. 8812.

Figure 3. *Myophoria silentiana* McLearn. Holotype, refigured. Geol. Surv. colls., cat. no. 8758.

Figure 4. *Sirenites pardoneti* n. sp. Holotype. Geol. Surv. colls., cat. no. 8844.

View of Peace river, Pardonet hill on the left, the Rocky Mountains in the far background.