The Ammonoid Genera Gastroplites and Neogastroplites[1]

By F. H. McLEARN, F.R.S.C.

The Lower Cretaceous ammonoid genera *Gastroplites* and *Neogastroplites* play an important part in the Lower Cretaceous chronology of the Canadian western interior. They define two zones or epochs of the Lower Cretaceous, comparable apparently with about early and late Albian time in terms of the European chronology. They have considerable biological interest and represent two stages of development of an hoplitid stock in which the venter followed a somewhat different course than in other Hoplitids. Spath has commented on the resemblance of *Gastroplites* to the Engonoceratids and to the genus *Knemiceras*.

Gastroplites occurs in the upper sandstone member of the Peace River formation along Peace river from about five or six to about twenty miles below the mouth of Cadotte river. It also occurs, far to the west, in the lower part of the Fort St. John shale on both sides of the Peace River canyon, near the mouth of Deep creek, *Neogastroplites* occurs at a much higher horizon and in the upper part of the Fort St. John shale on the north side of Peace river between the mouth of Cache creek and a little below Fort St. John. These faunas have, to date, only been found at these localities and apparently are of two boreal faunas that did not extend very far south. They may be found, in the future, at other northern localities. The stratigraphic and palaeogeographic relations of these faunas have been considered in previous papers.[2]

Collections made by A. R. C. Selwyn, 1875, R. G. McConnell, 1889, the writer 1917, and C. M. Sternberg, 1930, have been made use of in this study. King Gething discovered the *Gastroplites* locality on the south bank of the Peace River canyon near the mouth of Deep creek. Grateful acknowledgement is made to Dr. L. F. Spath for important advice in the study of the ammonoids. The writer however takes full responsibility for all statements made in the following pages.

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[1]Published with the permission of the Director, Geological Survey of Canada, Department of Mines, Ottawa.

[2]See McLearn, F. H., Trans. Roy. Soc. Can., ser. 3, vol. 26, Sec. IV, pp. 157-175 (1932).

Family HOPLITIDAE Hyatt emend. Spath.
Genus *Gastroplites* McLearn

1930 *Gastroplites* McLearn, Trans. Roy. Soc. Canada, 3rd ser., vol. 24, sec. IV, p. 7.

This genus includes, typically, moderately involute, compressed, oligogyral shells, with flattened sides, well defined ventral shoulders and tabulate or only slightly arched venters. The slightly flexuous and angular ribs mostly unite in pairs on the inner part of the lateral area to form a short primary which soon dies out on the inner margin. They are thickened or elevated a little where joined, but no actual bulla is formed. The ribs are curved a little on the sides, are thickened and prorsiradiate just on the ventral shoulder and cross the venter, where they are bent forward a little and broadened.

The suture line is reduced and rather simple. L1 is broad-stemmed, is longer than EL and is asymmetric, having a small saddle projecting into it on the outer side. L2 is small. ES is broad and S1 is not so broad as ES. There are two or three auxiliary lobes and saddles.

The genotype is *Hoplites canadensis* Whiteaves.

In early stages of growth the ribs do not cross the venter. In the adult stage they do and are arcuate and somewhat broader there than on the sides of the whorl. In *Gastroplites spiekeri* however they do not cross the venter and in *G. anguinus* they are of low relief there. *G. spiekeri* also has a more arched venter than the other described species.

Pseudosonneratia Spath[3] and *Arcthoplites* Spath[4] are also hoplitid genera in which the ribbing crosses the venter. The ribbing of *Pseudosonneratia* is much as in *Gastroplites* but does not broaden so much on the venter. This genus also does not have the tabulate venter and square ventral shoulders of *Gastroplites*, and the suture line is not the same. *Arcthoplites* has a more rounded whorl than *Gastroplites*, lacks the broadening of the ribs on the venter and has a somewhat less reduced suture line. The branching of the ribs takes place higher on the sides of the whorls, so that the primary ribs are longer than in *Gastroplites*. The parahoplitid genus *Hypacanthoplites*[5] Spath has a similar whorl shape, but different ribbing.

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[3]Spath, L. F., Ammonoidea of the Gault, vol. 1, part 2, Pal. Soc., p. 76 (1925).
[4]Spath, L. F., Ammonoidea of the Gault, vol. 1, part 2, Pal. Soc., p. 76 (1925).
[5]Spath, L. F., Ammonoidea of the Gault, vol. 1, part 1, Pal. Soc., p. 64 (1923).

Spath has noted the intermediate position of *Gastroplites* between the above genera and the Engonoceratids.[6] He has recorded the resemblance in form of some species of *Gastroplites* to *Knemiceras*. Among the species of *Gastroplites*, *G. spiekeri* has the most pseudoceratitic-like suture line. It has the largest saddle in the outer part of L1 and all the saddles have somewhat flattened tops, not only S2 and the auxiliary saddles. By further division of the saddles and enlargement of the saddle in L1 an *Engonoceras*-like suture line could result.

As only a few specimens are available the making of species is difficult. When more are found a revision may be necessary. The following separation however gives some idea of the variation. There is variation in degree of compression and involution, in stage of appearance of well defined ribs on the venter and of flattening and width of the venter.

Gastroplites canadensis (Whiteaves)
Plate 1, figures 4, 5

1892 *Hoplites canadensis* Whiteaves, Trans. Roy. Soc. Can., Sec. IV, 1892, p. 118, pl. 11, figs. 3, 3a, 4 and 5.

	a	*b*	*c*
Diameter	58.0	49.0	38.3
Height, whorl	43.0	43.8	43.0
Thickness, whorl	38.8	35.7	28.8
Width, umbilicus	30.0	27.2	....

The measurements *a* are taken at the anterior end of the ultimate whorl preserved. The measurements *b* are taken at the beginning of the last quarter of the ultimate whorl preserved. The measurements *c* are taken in the middle of the first quarter of the ultimate whorl preserved. All are approximate and are taken between ribs. Nearly half a whorl of living chamber is preserved. Only the ultimate whorl can be seen, for the umbilicus is filled with matrix which cannot be removed without damaging the specimen.

This is a stout-whorled, subangustumbilicate species. The posterior part of the ultimate whorl is relatively thin, is about one and one half times higher than thick, and has nearly flattened sides and venter. The anterior part of this whorl is proportionally much thicker, and has nearly flattened sides and broad, nearly flattened venter. The inner part of the inner margin is nearly upright, but

[6] Spath, L. F., Ammonoidea of the Gault, vol. 2, part 8, Pal. Soc., p. 342 (1931) and personal communication.

its outer part is sloping and convex and gradually rises into the lateral area.

The sides of the ultimate whorl are ornamented with about 26 angular, slightly curved ribs, mostly united in pairs at the edge of the inner margin into a weak short primary which extends a short distance on the outer part of the inner margin. The ribs are elevated and thickened a little at the point of junction. The ribs are continuous, thick and somewhat arcuate across the venter.

The suture line is simplified. EL is short, L1 is longer than EL and is broad and asymmetric. The small saddle on the outer side of L1 is much larger than a corresponding one on the inner side. S1 is rather slender. L2 is short. S2 is divided by a shallow lobule.

Horizon and Locality. Collected by R. G. McConnell on Peace river, 20 miles below Cadotte river, 1889. Presumably from the upper member of the Peace River sandstone.

Type. National Museum of Canada; holotype, Cat. No. 7430.

Gastroplites canadensis var.

Plate 1, figures 1 to 3

	a	*b*
Diameter	36.5	27.0
Height, whorl	46.5	48.5
Thickness, whorl	33.6	33.3
Width, umbilicus	21.0	19.2

The measurements *a* are taken at the anterior end of the ultimate whorl preserved. The measurements *b* are taken at about the middle of the third quarter of the same whorl. All are somewhat approximate and are taken between the ribs. The specimen is entirely septate.

It is a stout-whorled, oligogyral, subangustumbilicate, somewhat flattened platycone. The ultimate whorl is becoming less compressed anteriorly. In its anterior part it is flattened or nearly so on the venter. In its posterior part it is slightly rounded on the venter. The border of the inner margin is well rounded off.

The ribs on the sides are angular, of considerable relief, slightly curved and mostly bifurcate at the border of the inner margin from a short primary that soon dies out on the inner margin. At the point of furcation the ribs are thickened and raised a little. At the ventral shoulder the ribs are thickened and prorsiradiate and in the anterior part of the whorl are continuous across the venter as broad, thickened, somewhat arcuate, but not very high ribs. In the posterior part of this whorl the centre of the venter is almost smooth.

EL is longer than wide. ES is moderately deep. L1 is broad, asymmetric and larger than EL. S1 is fairly wide. L2 is small, short and narrow. S2 is wide and divided by a small lobule. There are three narrow, short auxiliary lobes and three small auxiliary saddles.

As the living chamber is missing and the mature features are not known the placing of this specimen is not easy. The ribs appear on the venter at about the same stage as in *Gastroplites canadensis* (Whiteaves), but the whorls are relatively thicker and higher at the stage of growth of about 36.5 mm. To parallel the development of *G. canadensis*, this species should with further growth develop even thicker and stouter whorls than *G. canadensis*. At a stage of growth of about 36.5 mm. the whorls are about as thick and stout as those of *Gastroplites allani* McLearn but at this stage *G. allani* does not have well defined ribs on the middle of the venter.

Horizon and Locality. Collected by McConnell in 1889 on Peace river, 5 or 6 miles below the mouth of Cadotte river and presumably from the upper member of the Peace River sandstone.

Type. National Museum of Canada; holotype, Cat. No. 7428.

Gastroplites stantoni McLearn

Plate 1, figures 9, 10

1931 *Gastroplites stantoni* McLearn, Trans. Roy. Soc. Can., 3rd ser., vol. 25, Sec. IV, p. 5, pl. 1, fig. 4.

Diameter	38.5
Height, whorl	48.0
Thickness, whorl	29.7
Width, umbilicus	20.0

About one-half of an entirely septate whorl is preserved. The measurements are made at its anterior end, are taken between the ribs and are somewhat approximate.

This is a compressed, flattened, fairly involute species with high rapidly enlarging whorls which are much higher than thick. The sides are nearly flattened. The venter is narrow and slightly arched. The ventral shoulder is abruptly rounded. The ribs on the sides are strong, subangular, of good relief, curved a little and most of them unite in a short primary which soon thins out on the inner margin. The ribs are elevated a little at the point of junction; a few ribs are single, but they do not extend to the inner margin. At the ventral shoulder the ribs thicken and are a little prorsiradiate. They extend

across the venter, are bent forward there, and are thickened and rounded.

The suture line is rather simple. EL is fairly wide. ES is wide and not very deep. L1 is wide, asymmetric and slightly longer than EL. S1 is relatively narrow. L2 is very narrow, small and much shorter than L1. S2 is wide and divided by a small lobule. There are at least two very small auxiliary lobes and saddles.

The complete and mature shell of this species is of course not known. Compared with equivalent growth stages of *Gastroplites canadensis* (Whiteaves) and its variety this species has relatively higher whorls and has a narrow slightly convex, not a broad almost flattened, venter. The ultimate whorl of course might have had a more flattened venter.

The name is given for Dr. T. W. Stanton of the U.S. Geological Survey.

Horizon and Locality. From the upper member of the Peace River sandstone on the west bank of Peace river about 15 miles below the mouth of Cadotte river.

Type. National Museum of Canada; holotype, Cat. No. 6336.

Gastroplites allani McLearn

Plate 1, figures 6 to 8

1931 *Gastroplites allani* McLearn, Trans. Roy. Soc. Can., 3rd ser., vol. 25, Sec. IV, p. 5, pl. 1, fig. 10.

	a	*b*
Diameter	47.0	31.0
Height, whorl	49.0	48.4
Thickness, whorl	31.0	32.8
Width, umbilicus	20.2	....

The measurements *a* are taken at the anterior end of the ultimate whorl preserved. The measurements *b* are taken at the middle of the ultimate whorl preserved. All are taken between the ribs and are approximate. The specimen is entirely septate and the living chamber is gone. It is therefore an incomplete specimen and the features and proportions of the adult mature shell are not known.

The shell is a subangustumbilicate oligogyral platycone. The posterior part of the ultimate whorl preserved differs somewhat from the anterior part. It has high and fairly thick whorls with nearly flattened sides and venter. The anterior part is slightly more compressed and has a slightly narrower and less flattened venter. Part

of the penultimate whorl exposed shows a slightly convex venter. The ribbing on the anterior part of the ultimate whorl preserved is more rounded than in other species and is partly single. The venter is nearly but not completely smooth on the posterior part of the ultimate whorl preserved, but the ribs extend across the venter in its anterior part; they are not yet strong there however. The middle of the venter of the penultimate whorl is smooth. The suture line prepared is similar to that of the other species of this genus.

At 36-38 mm. *Gastroplites canadensis* (Whiteaves) has thin whorls becoming thicker and *G. allani* has thicker and higher whorls becoming thinner and more compressed. *G. canadensis* var. has almost as stout whorls as *G. allani* at about 36 mm. diameter, but at this stage has the ribs on the venter better defined. *G. stantoni* has, at a diameter of about 35 mm. thinner and more compressed whorls and a more convex venter; it does not appear to pass through the broader more flattened venter stage that *G. allani* does.

The name is given for Professor J. A. Allan.

Horizon and Locality. Collected by McConnell in 1889 on Peace river about 20 miles below the mouth of Cadotte river. Presumably it is from the upper sandstone member of the Peace River formation.

Type. National Museum of Canada; holotype, Cat. No. 6337.

Gastroplites kingi McLearn

plate 3, figures 4, 5

1931 *Gastroplites kingi* McLearn, Trans. Roy. Soc. Can., 3rd ser., vol. 25, Sec. IV, p. 5, pl. 1, fig. 9.

	a	*b*
Diameter	75.0	63.2
Height, whorl	....	49.0
Thickness, whorl	....	25.0
Width, umbilicus	....	21.0

The measurement *a* is taken at the anterior end of the last whorl preserved. The thickness is not given because of crushing. The measurements *b* are taken about one quarter whorl back from the anterior end. All measurements are taken between the ribs.

This is a very compressed involute species with fairly coarse ribs. The venter is almost flat, is narrow and is crossed by broad arcuate ribs. In the anterior part of the ultimate whorl the branching of the ribs occurs fairly high on the side of the whorl.

It is much more compressed and involute than *Gastroplites cana-*

densis (Whiteaves). It is a little more compressed than *Gastroplites stantoni* McLearn and at equivalent stages of growth has somewhat coarser and more distantly spaced ribs.

The name is given for King Gething who found the locality from which the holotype was collected.

Horizon and Locality. Near the bottom of the Fort St. John shale on the south side of the Peace River canyon just above the mouth of Deep creek, B.C.

Type. National Museum of Canada; holotype, Cat. No. 6340.

Gastroplites anguinus McLearn
Plate 2, figures 1, 2

1931 *Gastroplites anguinus* McLearn, Trans. Roy. Soc. Can., 3rd ser., vol. 25, Sec. IV, p. 5, pl. 1, fig. 11.

Diameter	40.5
Height, whorl	33.3
Thickness, whorl	23.9
Width, umbilicus	37.7

The above measurements are taken at the anterior end of the ultimate whorl, between the ribs. The thickness is very approximate. The specimen is entirely septate.

The shell is a flattened sublatumbilicate serpenticone. The whorls have nearly flattened sides and venter. The ribs on the sides are angular, curved a little and most of them unite in pairs on the border of the inner margin to form a short primary which soon dies out. At the junction, the ribs are thickened and elevated. At the ventral shoulder the ribs are thickened and prorsiradiate and in the anterior part of the ultimate whorl preserved are continuous across the venter as low, barely distinguishable arcuate ribs. The suture line has a long, wide, asymmetric L1, longer than EL. S1 is deeper than wide. L2 is much shorter and smaller than L1. S2 is rather deeply divided by a lobule. There are in addition three very small auxiliary lobes and saddles.

This species differs from all of the above species in its wide umbilicus.

Anguinus, snake-like.

Horizon and Locality. In the upper sandstone member of the Peace River formation on Peace river, 8 miles below the mouth of Cadotte river.

Type. National Museum of Canada; holotype, Cat. No. 6338.

Gastroplites spiekeri McLearn

Plate 3, figures 2, 3

1931 *Gastroplites spiekeri* McLearn, Trans. Roy. Soc. Can., 3rd ser., vol. 25, Sec. IV, p. 5, pl. 2, fig. 2.

Diameter	70.8
Height, whorl	54.3
Thickness, whorl	31.7
Width, umbilicus	14.8

The measurements are taken at the anterior end of the specimen between the ribs and are approximate. Only part of a specimen is preserved and all is septate. It is about angustumbilicate and oligogyral. The whorls are compressed, the sides are nearly flattened and convergent, the venter is fairly narrow and quite arched and the inner margin is convex and not well differentiated from the sides. The slightly flexible ribs unite in pairs to form short primaries that soon die out as they approach the umbilicus. At the point of junction some of the ribs are raised a little. The ribs are thickened and prorsiradiate at the ventral shoulders, but do not extend across the arched venter which is smooth. The suture line has short lobes and shallow flat-topped saddles. L1 is markedly asymmetric and longer than EL. The saddle in the outer part of L1 is relatively larger than in the preceding species and this is the most pseudoceratitic-like of the *Gastroplites* suture lines.

This species differs from the preceding in the greater convergence of the sides and the arched, almost subcarinate smooth periphery.

The species name is given for E. M. Spieker.

Horizon and Locality. From the upper member of Peace River sandstone, 8 miles below Cadotte river on Peace river.

Type. National Museum of Canada; holotype, Cat. No. 6329.

Genus *Neogastroplites* McLearn

1931 *Neogastroplites* McLearn, Trans. Roy. Soc. Can., 3rd ser., vol 25, Sec. IV, p. 7.

Neogastroplites includes fairly involute platycones with flattened sides, tabulate to slightly convex venter, distinct ventral shoulders, and rostrate aperture. The lateral ribs are either angular or of low relief and unite in pairs just outside the umbilical margin or are single. The ribs are bent forward at the ventral shoulder and continuous and arcuate across the venter where they are much thickened or even considerably elevated into a node-like form. There is an

inner row of bullate tubercles at the union of the ribs on the sides and an outer row of clavellate tubercles on the ventral shoulder. The suture line is reduced and L1 is asymmetric. The genotype is *Buchiceras? cornutum* Whiteaves.

Neogastroplites is at a higher horizon than *Gastroplites* and appears to have been derived from it by the taking on of the two rows of tubercles and the greater thickening and elevation of the ribbing on the venter until it almost resembles a ventral row of tubercles. The tuberculate appearance of the ventral ribbing, however, may be accentuated by the crushing that most of the specimens have undergone. The L1 is not so asymmetric as in *Gastroplites*. The size is larger than that of *Gastroplites*.

The development of the venter in this boreal hoplitid stock differs from that in other hoplitid stocks. For example Spath[7] has recognized two main stocks of Hoplitids in the English Gault. In the one, through *Protohoplites* Spath, *Hoplites* Neumayr, *Euhoplites* Spath and *Discohoplites* Spath, the venter becomes first smooth, then sulcate and finally deeply furrowed. The second stock includes the derivatives of the long-ranging *Anahoplites* Hyatt. In the succession from *Anahoplites* through *Lepthoplites* Spath to *Pleurohoplites* Spath the venter is smooth and becomes subcarinate. In some species of *Callihoplites* Spath the venter becomes smooth and convex on the body chamber. In *Arrhaphoceras* Whitehouse emend. Spath, the ribbing is interrupted to some extent on the venter in most specimens but in some specimens tends to become continuous on the body chamber. There is no thickening of the ventral ribs as in the *Gastroplites-Neogastroplites* stock however.

Most specimens of *Neogastroplites* so far collected are crushed and separation into species is difficult. At present only two are recognized.

Neogastroplites cornutus (Whiteaves)

Plate 2, figure 4; plate 4

1885 *Buchiceras? cornutum* Whiteaves, Trans. Roy. Soc. Can., vol. 2, Sec. IV, p. 239.

Lectotype

Whiteaves did not designate any type or types and no illustration accompanied his description. The species however was evidently based on specimens in the collection made by Selwyn in 1875. From

[7]Spath, L. F., Ammonoidea of the Gault, Pal. Soc., vol. 1, Preface, p. IV (1930).

these specimens a lectotype has been chosen and is illustrated in Plate 2, figure 4.

The lectotype consists of part of one side of the last whorl. It is crushed. The umbilicus is not well defined but is small and the form is very involute. The inner tubercles are bullate and are situated a little outside the umbilical border. From them ribs of low relief, mostly two to each bulla, extend to the somewhat clavate tubercles on the ventral shoulder. The ribs extend across the venter, where they are swollen into a low node-like form. The suture line is not preserved.

Plesiotype No. 8007

	a	*b*
Diameter	172	158
Height, whorl	...	54
Thickness, whorl	...	...
Width, umbilicus	...	10

This, the best preserved specimen of *Neogastroplites*, is included in *N. cornutus* for the present, at least, and is figured in plate 4. It is somewhat flattened by pressure, but how much is difficult to estimate. No reliable measurement of thickness therefore can be made. The measurement *a* is taken at the anterior end. The measurements *b* are taken between the third and fourth last ventral nodes.

The form is compressed and involute. The venter is very gently convex, not quite tabulate. The apertural margin is rostrate. The rostrum is angular on the median line, but is possibly so because of distortion. The sides of the aperture are slightly convex forward, but do not form a true lappet. The inner tubercles are large and bullate. Those on the ventral shoulder are clavate and almost twice as many as those of the inner row. The ribs are broad and vary in relief. The longer ones run from the inner tubercles to those on the ventral shoulder. Shorter ones lie between. The ribs on the venter, are raised into node-like projections, which however may have been accentuated by distortion.

The suture line is asymmetric and the ventral saddle is on the inner slope of the ventral "node". The ventral shoulder tubercle is on ES. L1 is asymmetric.

Horizon and Locality. The lectotype was collected by A. R. C. Selwyn in 1875 on Peace river, near Fort St. John and must have come from the upper part of the Fort St. John shale. The plesiotype was collected from the upper part of the Fort St. John shale on the north bank of Peace river, four miles east of the mouth of Cache creek.

Types. National Museum Canada; lectotype, Cat. No. 5039; plesiotype, Cat. No. 8007.

Neogastroplites selwyni n. sp.
Plate 2, figure 3, plate 3, figure 1

Although only a part of one side and part of the venter of the living chamber are preserved, the holotype specimen shows sufficient difference from *Neogastroplites cornutus* (Whiteaves) to refer it to a new species.

It evidently is a stout whorled species with flattened sides and almost flattened venter. Three stages of ornament are preserved. The last at the anterior end, shows that the ornament reverts to a *Gastroplites*-like ornament. At the posterior end of the holotype specimen, two relatively slender ribs pass from the bullate tubercle on the umbilical border to the clavate tubercle on the ventral shoulder forming a sort of lautiform ornament. The ribbing on the venter appears to be somewhat swollen, but the preservation is too poor to determine accurately. Anterior to this in another stage of ornament two ribs unite, or almost do, at the inner and bullate tubercle and pass out to the clavate tubercles on the ventral shoulder. The ribbing across the venter is arcuate and very broad. At the anterior end, in the last stage of ornament, the inner bullate tubercle is reduced, the clavate tubercle at the ventral shoulder is gone and the ribs are closer together. *Neogastroplites cornutus* does not show this reduction in tuberculation at an equivalent stage of growth.

Horizon and Locality. Collected by A. R. C. Selwyn in 1875 on Peace river near Fort St. John and presumably from the upper part of the Fort St. John shale.

Type. National Museum of Canada; holotype, Cat. No. 8008.

EXPLANATION OF PLATES

(Unless otherwise stated, the figures are of natural size)

PLATE I

Gastroplites canadensis Whiteaves var. (page 16)

FIGURE 1.—Apertural view. Nat. Mus. Can., Cat. No. 7428.
FIGURE 2.—Ventral view same specimen.
FIGURE 3.—Lateral view same specimen.

Gastroplites canadensis (Whiteaves) (page 15)

FIGURE 4.—Lateral view holotype. Nat. Mus. Can., Cat. No. 7430.
FIGURE 5.—Ventral view same specimen.

Gastroplites allani McLearn (page 18)

FIGURE 6.—Lateral view holotype. Nat. Mus. Can., Cat. No. 6337.
FIGURE 7.—Ventral view second quadrant ultimate whorl, same specimen.
FIGURE 8.—Ventral view anterior part ultimate whorl, preserved, same specimen.

Gastroplites stantoni McLearn (page 17)

FIGURE 9.—Ventral view, holotype. Nat. Mus. Can., Cat. No. 6336.
FIGURE 10—Lateral view, same specimen.

PLATE 2

Gastroplites anguinus McLearn (page 20)

FIGURE 1.—Ventral view holotype. Nat. Mus. Can., Cat. No. 6338.
FIGURE 2.—Lateral view, same specimen.

Neogastroplites selwyni McLearn (page 24)

FIGURE 3.—Lateral view holotype. Nat. Mus. Can., Cat. No. 8008.

Neogastroplites cornutus (Whiteaves) (page 22)

FIGURE 4.—Lateral view lectotype X, a little more than ½. Nat. Mus. Can., Cat No. 5039.

PLATE 3

Neogastroplites selwyni McLearn (page 24)

FIGURE 1.—Ventral view holotype. Nat. Mus. Can., Cat. No. 8008.

Gastroplites spiekeri McLearn (page 21)

FIGURE 2.—Sectional view holotype. Nat. Mus. Can., Cat. No. 6339.
FIGURE 3.—Lateral view, same specimen.

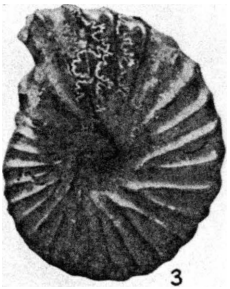
Gastroplites kingi McLearn (page 19)

FIGURE 4.—Ventral view holotype. Nat. Mus. Can., Cat. No. 6340.
FIGURE 5.—Lateral view, same specimen.

PLATE 4

Neogastroplites cornutus (Whiteaves) (page 23)

FIGURE 1.—Lateral view plesiotype X ½. Nat. Mus. Can., Cat. No. 8007.



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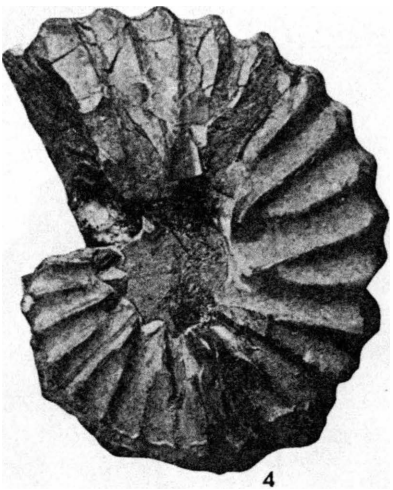

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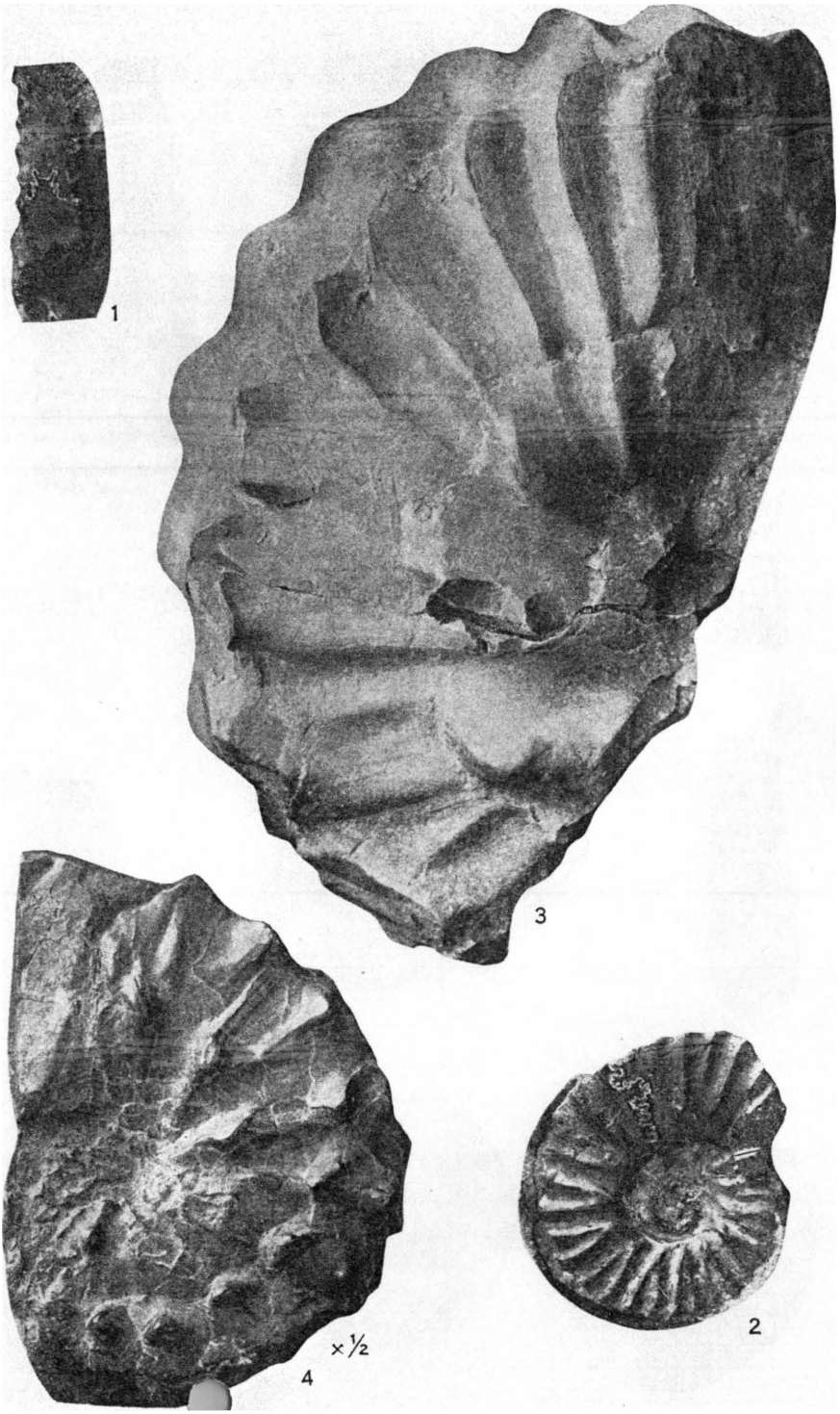
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× ½
2

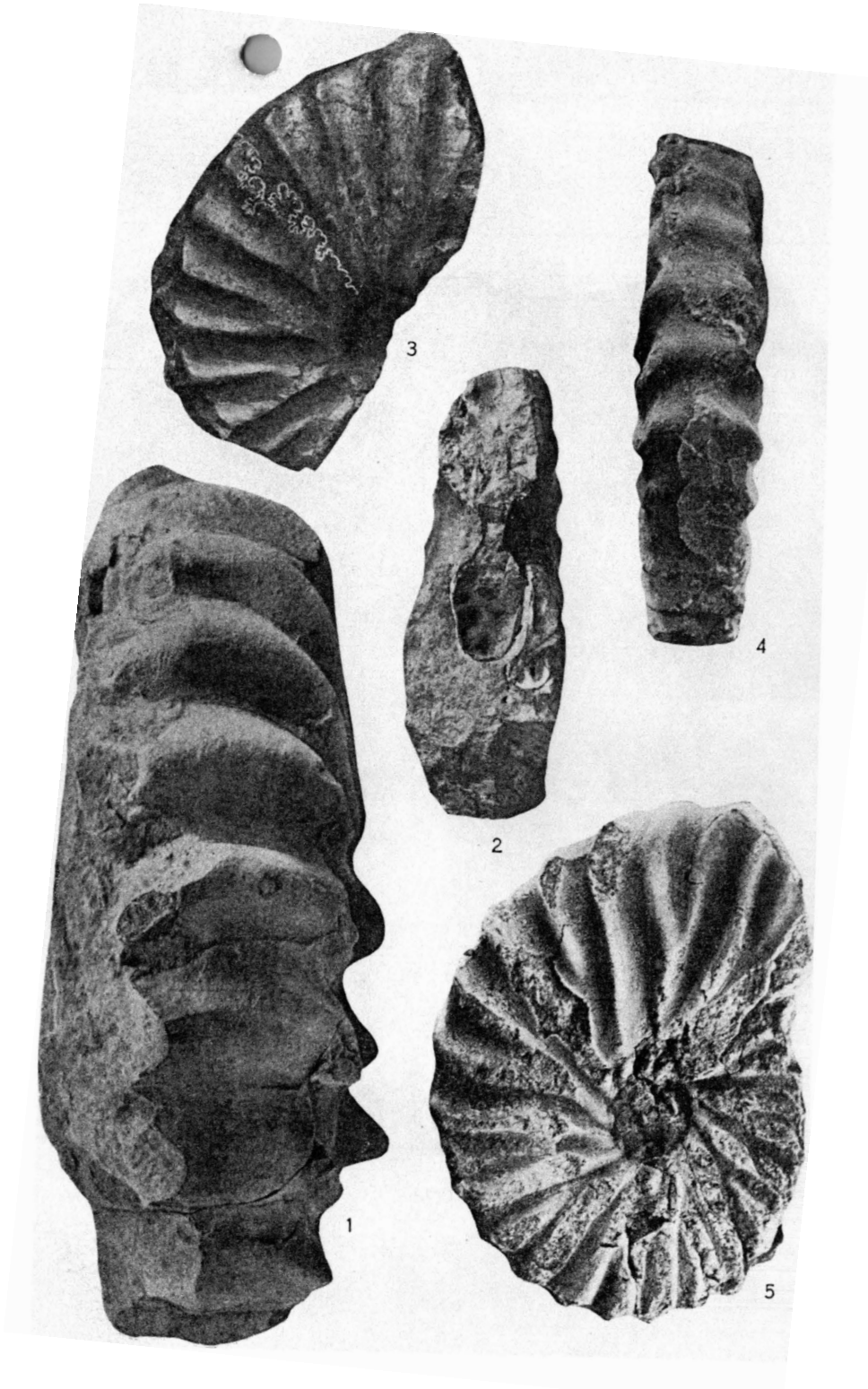
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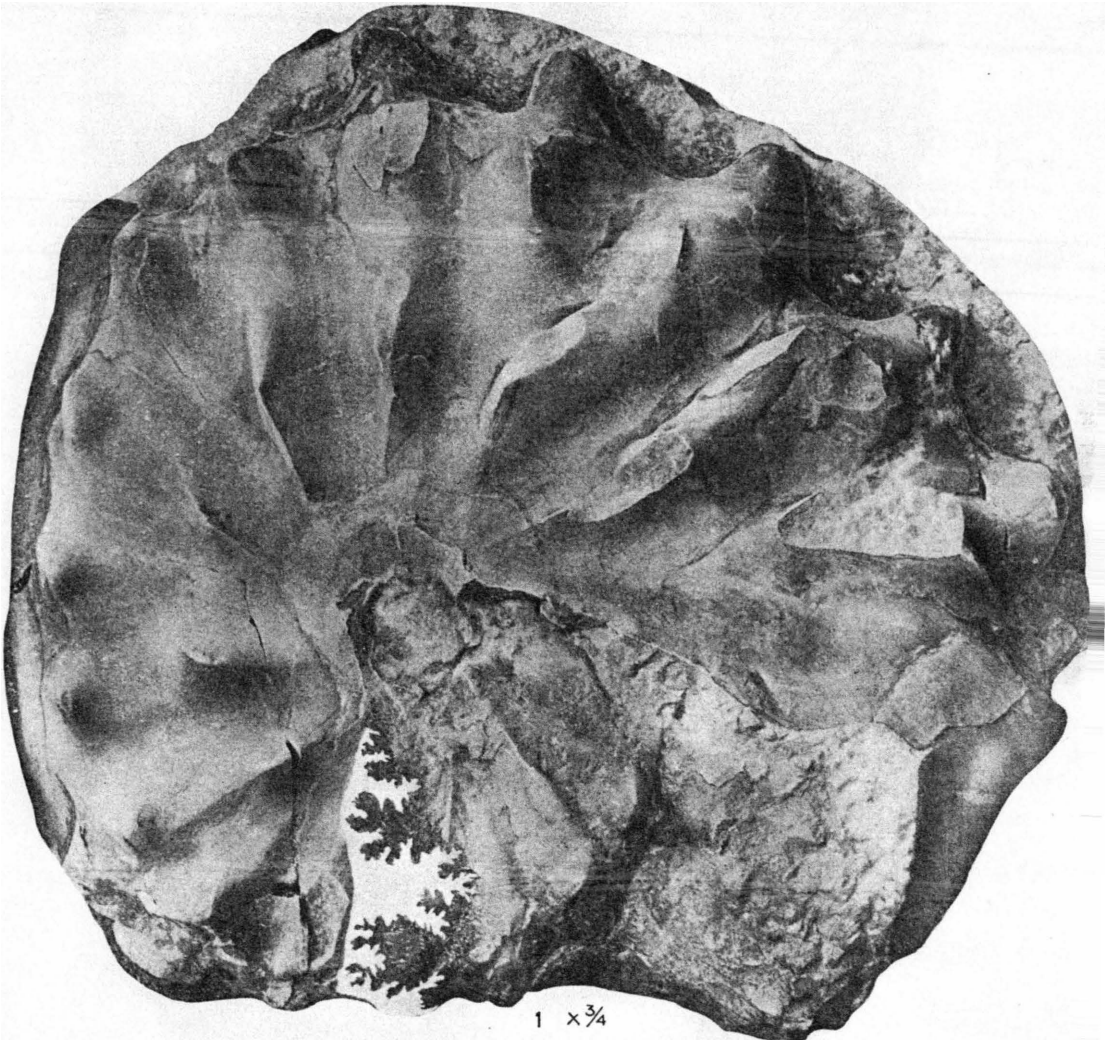
PLATE IV



1 ×¾