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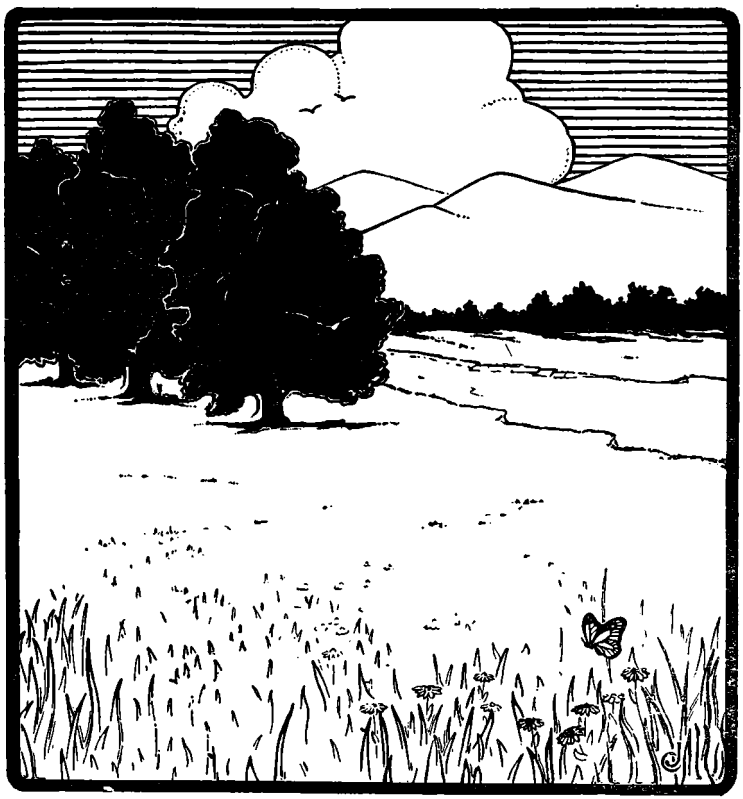

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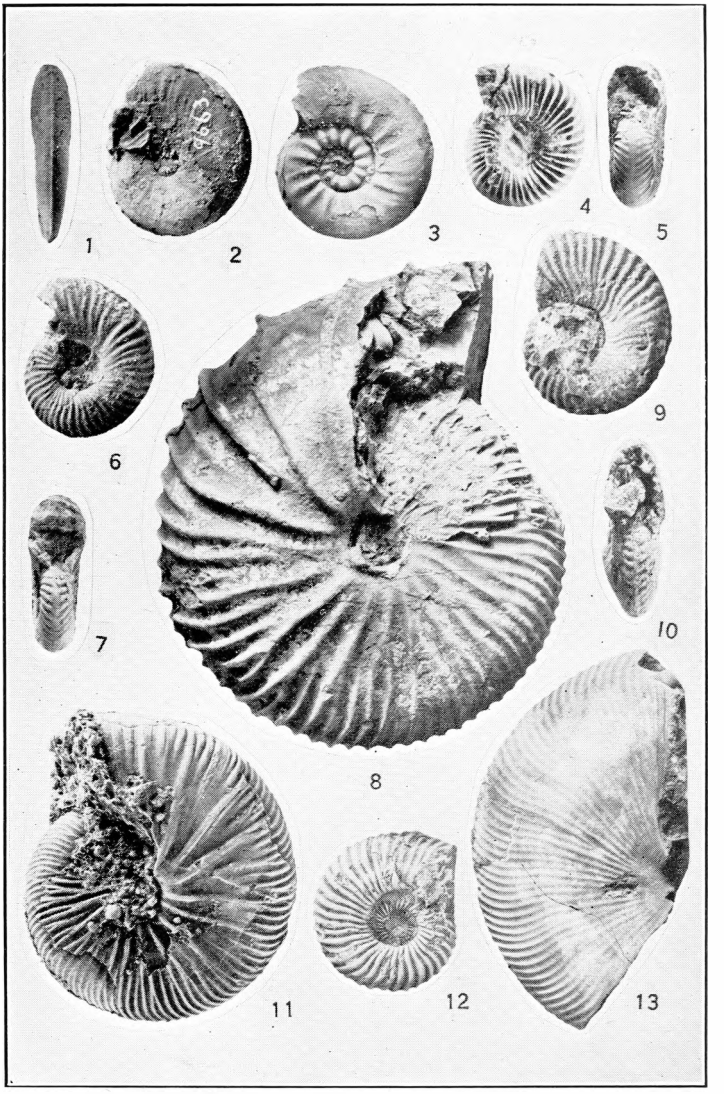

PLATE 1

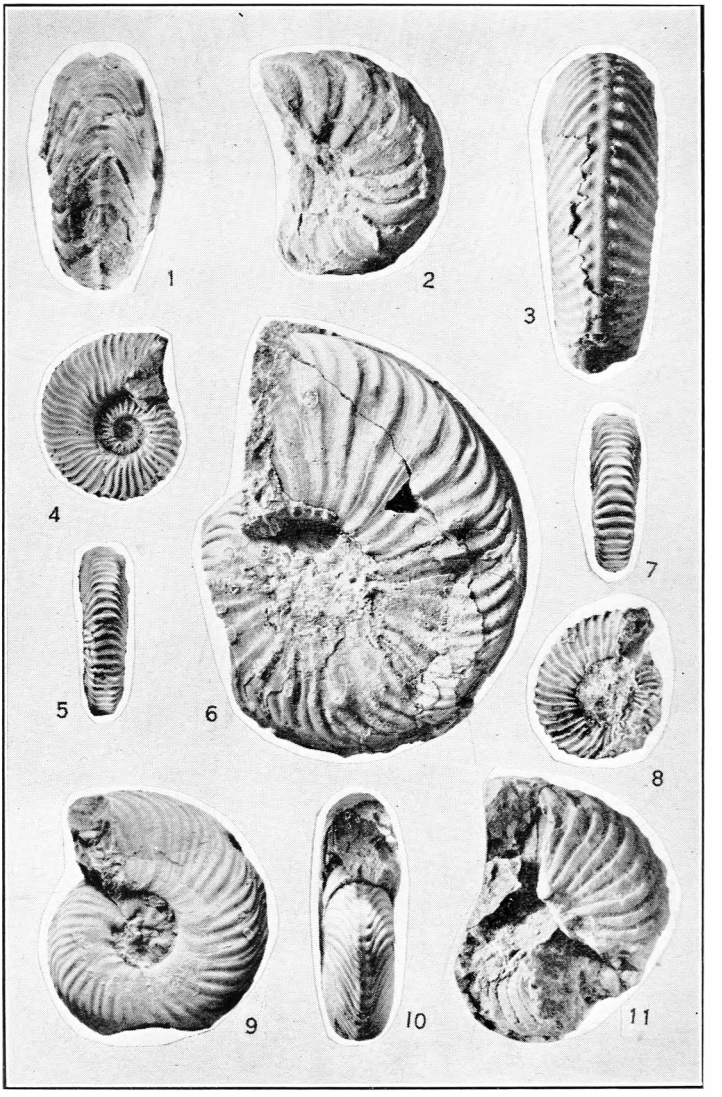

PLATE 2

The Canadian Field-Naturalist

VOL. LIV OTTAWA, CANADA, APRIL, 1940 No. 4

NEW CANADIAN TRIASSIC AMMONOIDS*

By F. H. McLEARN

A FEW new species and varieties of ammonoids from the Triassic Schooler Creek formation are described in the following pages. *Asklepioceras glaciense* n. sp. and *A. laurenci* n. sp. are in the *Nathorstites* fauna. *Juvavites* (*Dimorphites?*) *pardonetiensis* n. sp., *Styrites columbianus* n. sp., *Styrites irencanus* n. sp., *Buchites hilaris* var. *dawsoni* n. var., *Thisbites charybdis* var. *custi* n. var., and *T. charybdis* var. *ireneanus* n. var. are from the *Stikinoceras-Styrites* (or *Stikinoceras-'Palicites'*) fauna. *Juvavites magnus* n. sp. and *Juvavites biornatus* n. sp. are in what may be tentatively be called the *Drepanites* fauna. *Helictites decorus* n. sp., *H. decorus* var. *obesus* n. var *H. decorus* var *transitionis* n. var., *Daphnites* (*Phormedites?*) *stelcki* n. sp., and *Distichites doidli* var. *canadensis* n. var. are in the *Distichites* fauna.

Revised lists of ammonoids of the Schooler Creek formation, based on recent studies and descriptions of new species and varieties follow. The Nathorstites fauna includes *Isculites schooleri, I. schooleri* var. *parvus, Lobites pacianus, Nathorstites* cf. *mcconnelli* Whiteaves, *N.* cf. *mcconnelli* var. *lenticularis* Whiteaves, *Sagenites gethingi, Nitanoceras selwyni, Proarcestes* sp. *Silenticeras hatae, Sirenites meginae, Protrachyceras sikanianum, P. zauwae, Asklepioceras glaciense* and *A. laurenci.* This fauna is correlated with the later Ladinian or early Karnian of Europe, that is late Meso-Triassic or very early Neo-Triassic.

The *Stikinoceras-Styrites* (or *Stikinoceras Palicites'* fauna) includes *Juvavites bococki, J.* cf. *mackenzii, J. clavatus, J.?* cf. *carlottensis* Whiteaves, *J.* (*Anatomites*) *humi, J.* (*Griebachites*) sp., *J.* (*Dimorphites?*) *pardonetiensis, 'Tropites* sp., *Styrites columbianus, S. irencanus, Sirenites nabeschi, Stikinoceras kerri, Buchites hilaris* var. *dawsoni, Thisbites charybdis* var. *irencanus* and *T. charybdis* var. *custi.* In addition the following, collected from talus, are thought to be of this fauna: *Juvavites mackenzii, J. mertoni, J.* (*Gonionotites*) *spiekeri, Malayites dawsoni, Discotropites* cf. *acutus* Mojsisovics, *Waldthausenites* sp., *Stikinoceras robustum, 'Palicites'* and *Placites.* This fauna is correlated with the Karnian of Europe and is early Neo-Triassic.

In the westernmost part of the area studied a fauna similar in age to the above was collected with *Discotropites sandlingensis* Hauer and *Discotropites* cf. *formosus* Smith.

The *Drepanites* fauna includes a number of species tentatively grouped together. They do not all have exactly the range of the *Drepanites*, but they occur closely enough together stratigraphically to warrant a tentative assumption of their association as one fauna. They include *Juvavites magnus, J. biornatus, Drepanites rutherfordi, Cyrtopleurites magnificus, C.* cf. *bicrenatus* Hauer and *Pterotoceras caurinum* var. *elegantulum.* In addition *Pterotoceras caurinum* was collected from talus. It is possible that *Thisbites* cf. *meleagri* Mojsisovics belongs to this fauna. It is correlated with the Norian of Europe and is about middle Neo-Triassic time.

The somewhat later *Distichites* fauna contains *Parajuvavites* sp., *Isculites browni, I.* cf. *smithi* Diener, *'Heraclites'* cf. *aricinae* Mojsisovics, *Sirenites* cf. *elegantiformis* Diener, *Himavatites columbianus, Distichites* cf. *mesacanthus* Diener, *D.* cf. *megacanthus* Mojsisovics, *D. loidli* var. *canadensis, Helictites decorus, H. decorus* var. *obesus, H. decorus* var. *transitionis, Daphnites* (*Phormedites?*) *stelcki, Placites* and *Pinacoceras.* In addition the following were collected from talus: *Arcestes* sp., *Himavatites* cf. *watsoni* Diener and *Helictites* cf. *subgeniculatus* Mojsisovics. This fauna is compared with the Norian of Europe and is about middle Neo-Triassic age.

The succeeding fauna with *Monotis subcircularis* Gabb can be compared with the later Nor-

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ian of Europe. It includes the ammonoids *Dyphyllites* and *Placites*.

The following descriptions are brief and preliminary, but are thought to be sufficient to establish the new species and varieties. More elaborate descriptions and adequate illustrations will be given in a report now in preparation.

Juvavites magnus n. sp.
Plate I, figure 8

This large species has higher than thick whorls, a narrowly arched venter at the posterior end of the ultimate whorl and a broadly arched venter at the anterior end, where there is a considerable expansion in the thickness of the whorl. The posterior part of the ultimate whorl is ornamented with relatively slender, but elevated, ribs, all of which bifurcate on the outer part of the sides and some divide near the umbilical shoulder. All ribs are arcuate and continuous across the venter. The ribs are stronger and farther apart on the anterior part of the ultimate whorl, and on the last quadrant the bifurcation is lost and both long and short, single ribs are highly elevated where they cross the ventral area.

This species is distinct from others of the *continui* group of *Juvavites* in the combined characters of compressed whorls expanding in thickness at the anterior end of the ultimate whorl, loss of bifurcation at the anterior end and elevated ribs. There is some resemblance to *Juvavites nepotis* var. *timorensis* Welter, in ornament and form, but the Timor species has the ribs interrupted on the venter.

Geological Survey collections; holotype, cat. no. 8837.

Juvavites biornatus n. sp.
Plate I, figure 11

The holotype is of moderate size, is compressed and involute, and has higher than thick whorls, somewhat flattened sides of the whorls, well rounded and not well-defined, ventral shoulders, arched, rather narrow, ventral area and narrow, rather deep umbilicus. The posterior half of the last whorl is ornamented with slender, elevated, bifurcating ribs which divide on the outer part of the sides and some, in addition, divide nearer the umbilical shoulder. The ribs are slightly curved on the sides, are bent forward a little near the ventral shoulder and continue across the venter, where they have the form of a low arch. In the last quadrant of the ultimate whorl, bifurcation is lost and there are long, fairly widely spaced, strong, elevated ribs and several, short, elevated ribs between them. All specimens have approximately the general form of the holotype and the two styles of ribbing but there is considerable variation in thickness of whorl, in size and number of ribs and in the stage of growth at which the change in style of ribbing takes place.

There is some resemblance to the Alpine species *Juvavites senni* Mojsisovics, which, however, does not appear to have the second style of ribbing. Some species from Timor have the second style of ribbing, but they seem to have it exclusively and lack the first style, or they have two somewhat similar stages of ribbing, but differ in having more acutely arcuate ribbing across the venter or differ in proportions of the shell.

Geological Survey collections; holotype, cat. no. 8838.

Juvavites (*Dimorphites*?) *pardonetiensis* n. sp.
Plate I, figure 13

This fairly compressed, involute species, has high, thin whorls, flattened or nearly flattened venter and rounded, ventral shoulders. The ribs are fine, rounded, slightly convex on the sides and bent forward near the ventral shoulder. There is a narrow, smooth band on the venter. This species has more slender and rounded ribs than the Alpine species *Dimorphites selectus* Mojsisovics and has rounded, not angular, ventral shoulders. It has more slender and more rounded ribs than the Sicilian species *Juvavites* (*Dimorphites*) *mariae* Gemmellaro.

Geological Survey collections; holotype, cat. no. 8833.

Styrites columbianus n. sp.
Plate I, figure 3

The holotype is a stout-whorled shell with thicker than high, inner whorls becoming relatively lower and thinner and about as high as thick anteriorly, that is there is whorl contraction and there is also some umbilical expansion. Other specimens have more slender whorls like those of the type specimen of the Sicilian species, *Styrites haugi* Gemmellaro. Compared with this species all the Peace River specimens have longer ribs on the ultimate whorl and some have more ribs per whorl.

Geological Survey collections; holotype, cat. no. 8827.

Styrites irencanus n. sp.
Plate I, figures 1, 2

This is a very much compressed, fairly involute shell, with very thin, high whorls and a sharp venter surmounted by a small keel. Beyond

about 18 mm. diameter, the venter widens and flattens, definite ventral shoulders form, but the keel remains small. The surface is nearly smooth. Growth lines and some striae are nearly straight or slightly convex on the sides and strongly projected forward near the venter. This species is larger than the Alpine species, *Styrites altus* Mojsisovics and also differs in the widening and flattening of the ventral area at maturity.

Geological Survey collections; holotype, cat. no. 8826.

Buchites hilaris var. *dawsoni* n. var.
Plate I, figure 4, 5

In this variety are included moderately evolute shells with rounded whorls, about as high as thick and somewhat stouter than those of the Alpine species, *Buchites hilaris* Mojsisovics. The shells of this variety are also larger and have more ribs per whorl, about 45 in the holotype. The venter is at first smooth. Faint tubercles appear at the ends of the ribs and in some specimens a faint, hair-like line appears on the venter. Finally, in large specimens, the ribs cross the venter, although they are mostly reduced in relief there. This last stage of ventral ornament comes at a later stage of growth than in the typical species.

Geological Survey collections; holotype, cat. no. 8825.

Thisbites charybdis var. *custi* n. var.
Plate I, figures 6, 7

This is a moderately compressed moderately evolute shell, with higher than thick, fairly rounded whorls. The sides of the whorl are gently convex, the venter arched and the ventral shoulders well rounded. There is, in some specimens a faint, ventral elevation or poorly defined carina. The fine, approximate ribs are bent forward a little near the venter and end in slight swellings or carina.

Compared with the Sicilian species *Thisbites charybdis* Gemmellaro, this variety has more rounded, less compressed whorls and fainter and less well defined carina and tubercles. It is more compressed than *Buchites hilaris* var. *dawsoni* and has a better, if poorly, defined, ventral elevation on carina.

Geological Survey collections; holotype, cat. no. 8801.

Thisbites charybdis var. *ireneanus* n. var.
Plate I, figures 9, 10

This variety has flatter and more compressed whorls and better defined ventral shoulders than var. *custi*. It is closer to the species than var. *custi*, but it has, like this variety, a poorly defined, ventral elevation or faint carina and only faint tubercles.

Geological Survey collections; holotype, cat. no. 8802; paratype, cat. no. 8791.

The generic position of the three foregoing forms, *Buchites hilaris* var. *dawsoni*, *Thisbites charybdis* var. *custi* and *Thisbites charybdis* var. *ireneanus* is not completely solved and the genera assigned are likely only tentative. They are so assigned because Mojsisovics and Gemmellaro have so placed the species of which they are assumed to be varieties. The three shells resemble one another and *T. charybdis custi* is somewhat intermediate between the other two. They all share the very moderate curvature of the ribs, the faint tubercles at the ends of the ribs, the tendency for a faint line or poorly defined carina to appear on the otherwise smooth venter and the tendency at maturity for the ribs to cross the venter, although mostly only faintly. The general outline of *B. hilaris dawsoni* suggests *Buchites*, but it is not a true *Buchites*. It is much smaller and does not develop the style of ventral ribbing of *Buchites*. The compressed form, ribbing, faint tuberculation and faint ventral carination of *T. charybdis custi* and *T. Charybdis ireneanus* are transitional toward *Thisbites*. But all lack the stronger tuberculation and better defined, although small, ventral carina or keel of typical *Thisbites*, that is of a *Thisbites* like *Thisbites agricolae* Mojsisovics. Any generic revision will involve not only the foregoing varieties and species, but also several Sicilian species that Gemmellaro has included in *Buchites* and *Thisbites*.

Helictites decorus n. sp.
Plate II, figures 4, 5

This is a variable, compressed species with higher than thick whorls, rounded to abruptly rounded, ventral shoulders, flattened to slightly convex, convergent sides, flattened to somewhat rounded venter, fine and numerous ribs which are stiff to somewhat curved on the sides, curved forward on the outer part of the sides and slightly arcuate to nearly straight across the venter. There are no tubercles or knot-like swellings on the ventral shoulders, although in a few specimens, including the holotype, there is a slight elevation of the ribs on the ventral shoulder, in the anterior part of the ultimate whorl.

There is at least some superficial resemblance to the Timor species *Cycloceltites oppiani* Diener, which is not a true *Cycloceltites*, but *H. decorus*

seems to have flatter sides and venter, better defined ventral shoulders and ribs straighter across the venter and not so inclined on the sides.

Compared with typical *Helictites* our species is more compressed and lacks the tubercles or knot-like swellings on the ventral shoulder.

Geological Survey collections; holotype, cat. no. 8824.

Helictites decorus var. *obesus* n. var.
Plate I, figure 12

This variety has more rounded and less compressed whorls than the holotype. The whorls are nearly as thick as high, to as thick as high. Venter and ventral shoulder are well rounded, but the sides are somewhat flattened. The ribs are thick, most so on the venter, are stiffer on the sides of the whorl than in the typical species and are arcuate across the venter. As in the typical species, both the ribs and the spaces between them are covered with fine, even striae.

This variety shows considerable resemblance to a specimen from Timor figured as *Helictites mojsvari* by Diener (1923, pl. 12, figs. 5a, b.) This does not mean that it is close to *H. Mosjsvari* for the type of that species should be the very different specimen figured by Diener (1906, p. 17, pl. 8, figs. 15a-c) from India. Diener included both the Timor and Indian specimens in this species when he described it, but the Indian specimen corresponds the more closely to the original description.

This is the variety that departs the most from typical *Helictites* and the genotype, *Helictites geniculatus* Hauer, in rounding of whorl, absence of tubercles on the ventral shoulder and degree of arcuation across the venter. It is smaller than, less robust than and lacks the umbilical tubercles of *Helictites sundaicus* Diener from Timor.

Geological Survey collections; holotype, cat. no. 8822.

Helictites decorus var *transitionis* n. var.
Plate II, figures 7, 8

Compared with the typical species, this variety has lower, less compressed and stouter whorls, flatter venter and fewer ribs which are stiffer on the sides, more nearly straight across the venter and more highly elevated on the ventral shoulder. The whorls are almost as thick as high. Thus this is the variety that approaches the more closely to typical *Helictites*. It is not close enough, however, to have a tubercle or knot-like swelling on the ventral shoulder. The whorls are a little more compressed than those of the Indian species *Helictites mojsvari* Diener and there are no knot-like swellings on the ventral shoulder.

Geological Survey collections; holotype, cat. no. 8823.

Daphnites (*Phormedites*?) *stelcki* n. sp.
Plate II, figures 9, 10

This is a large, compressed, moderately evolute species with somewhat flattened whorls, as high as thick to higher than thick. There is a flat or very shallow, sulcate, smooth band on the venter. The ribs are strongly projected forward near the venter and end in low clavi or tubercles on the border of the ventral smooth band. In some specimens there are also narrow, discontinuous carinae bordering the ventral, smooth band. At maturity the ribs cross the venter, where they are low and broad and are separated by broad shallow furrows. There is an early stage of ornament, ending on the posterior part of the ultimate whorl, where flat, triangular or bluntly pointed bullae are situated on the umbilical shoulder and give origin to several ribs. The mature ventral ornament resembles that of a *Phormedites*, the ventral, smooth, shallow band resembles that of a *Daphnites*. It is larger than the Alpine *Daphnites berchtae* Mojsisovics, has fewer and larger costae, has a more shallow, ventral furrow or even merely a flat, smooth band. Where marginal carinae are present they are discontinuous and partly replaced by low tubercles or clavi. Moreover in the adult stage the ribs cross the venter. It is of course quite different from a *Daphnites* like *D. ungeri* Mojsisovics, with its deep, ventral furrow.

Geological Survey collections; holotype, cat. no. 8832.

Distichites loidli var *canadensis* n. var.
Plate II, figure 6

This is a compressed, moderately involute shell, with a higher than thick ultimate whorl. The narrow, ventral sulcus is bordered by narrow keels. The ornament differs from that of the Alpine species *Distichites loidli* Mojsisovics in having two instead of three rows of lateral tubercles, in having one of these, the umbilical row, weaker and in having the outer row stronger than the outermost row of *D. loidli*. It is also not so involute as the typical species. The ribs are not so broad as in the Timor species, *Distichites tropicus* Diener and it has a weaker umbilical and a stronger, outer row of tubercles.

Geological Survey collections; holotype, cat. no. 8816.

Asklepioceras glaciense n. sp.
Plate II, figure 11

This is relatively large, robust, fairly involute species. The whorls are stout, have somewhat flattened, convergent sides, broad, flatly rounded venter and rounded, ventral shoulders. The ventral sulcus, beginning near the posterior end of the ultimate whorl, deepens on the anterior part of this whorl. The sides are ornamented with numerous, even, flat, band-like to somewhat convex ribs, separated by deep, narrow sulci, recording evenly spaced ridges on the inside of the shell. The sulci and ribs bend forward on the ventral shoulder and extend to the ventral sulcus. There is a variable number of rows of small tubercles on the sides of the whorl and two or three rows of clavi next to the ventral sulcus. Some ribs end in a small bulla on the umbilical shoulder. The suture line is poorly preserved. ES, however, is entire.

The form is similar to that of the Grecian and Anatolian species, *Asklepioceras helenae* Renz, but the sulci and internal ridges are more evenly and closely spaced. The tubercles persist to the anterior end of the shell.

Geological Survey collections; holotype, cat. no. 8808.

Asklepioceras laurenci n. sp.
Plate II, figures 1, 2

This is a stout-whorled, fairly involute species with whorls about as high as thick. The sides of the whorl are almost flat and convergent, the venter wide and flatly arched and the ventral shoulders rounded. Deep sulci are fairly evenly spaced and projected forward on the ventral shoulder and some cross the ventral sulcus. The sulci set off wide, flat bands, somewhat narrowed and somewhat pointed or narrowly rounded at their inner ends, on the umbilical shoulder. These bands are covered with fairly even varices of growth.

This species bears no tubercles like *Asklepioceras helenae* Renz and the ornament is more like that of the Alpine species *Asklepioceras segmentatus* Mojsisovics, from which it differs in having thicker and stouter whorls and smaller umbilicus.

Geological Survey collections; holotype, cat. no. 8805.

DESCRIPTION OF PLATES

PLATE I

Figure 1 *Styrites ireneanus* n. sp. Ventral view. Holotype. Geol. Surv. colls., cat. no. 8826.

Figure 2 Same specimen. Side view.

Figure 3 *Styrites columbianus* n. sp. Side view. Holotype, Geol. Surv. colls., cat. no. 8827.

Figure 4 *Buchites hilaris* var. *dawsoni* n. var. Side view. Holotype, Geol. Surv. colls., cat. no. 8825.

Figure 5 Same specimen. Apertural view.

Figure 6 *Thisbites charybdis* var. *custi* n. var. Side view. Holotype, Geol. Surv. colls., cat. no. 8801.

Figure 7 Same specimen. Apertural view.

Figure 8 *Juvavites magnus* n. sp. Side view. Holotype. Geol. Surv. colls., cat. no. 8837.

Figure 9 *Thisbites charybdis* var. *ireneanus* n. var. Side view. Holotype. Geol. Surv. colls., cat. no. 8802.

Figure 10 Same specimen. Apertural view.

Figure 11 *Juvavites biornatus* n. sp. Side view. Holotype. Geol. Surv. colls., cat no. 8838.

Figure 12 *Helictites decorus* var. *obesus* n. var. Side view. Holotype. Geol. Surv. colls., cat. no. 8822.

Figure 13 *Juvavites* (*Dimorphites*?) *pardonetiensis* n. sp. Side view. Holotype. Geol. Surv. colls., cat. no. 8833.

PLATE II

Figure 1 *Asklepioceras laurenci* n. sp. Ventral view. Holotype. Geol. Surv. colls., cat no. 8805.

Figure 2 Same specimen. Side view.

Figure 3 *Thisbites charybdis* var. *ireneanus* n. var. X 4. Ventral view. Paratype. Geol. Surv. colls., cat. no. 8791.

Figure 4 *Helictites decorus* n. sp. Side view. Holotype. Geol. Surv. colls., cat no. 8824.

Figure 5 Same specimen. Ventral view.

Figure 6 *Distichites loidli* var. *canadensis* n. var. Side view. Holotype. Geol. Surv. colls., cat. no. 8816.

Figure 7 *Helictites decorus* var. *transitionis* n. var. Ventral view. Holotype. Geol. Surv. colls., cat no. 8823.

Figure 8 Same specimen. Side view.

Figure 9 *Daphnites* (*Phormedites*?) *stelcki* n. sp., Side view. Holotype. Geol. Surv. colls., cat. no. 8832.

Figure 10 Same specimen. Apertural view.

Figure 11 *Asklepioceras glaciense* n. sp. Side view. Holotype. Geol. Surv. colls., cat no. 8808.