Systematic descriptions

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Caurus and pre-Middle Anisian in age and therefore has no exact correlative known from some place else. The Lower-Middle Triassic boundary has customarily been placed between the *Spiniplicatus* Zone and the *Karangatites* beds of the *Taimyrensis* Zone (DAGYS and others 1977), what is consistent with both Canada and Nevada.

Other various Lower Anisian ammonoids occurrences

Lower Anisian ammonoids have been reported from several section of lesser importance. In Central Iran, a few Lower Anisian ammonoids were found in the Alam Formation (TOZER 1972a). *Ugraites,* a genus generally thought to be of Lower Anisian age and *Caucasites* are both listed in the "second ammonoid assemblage" of SHEVYREV (1968, p. 34). This suggests that Lower Anisian may potentially be recognized in the sequence of northwestern Caucasus, for the only unquestionable available occurrence of *Caucasites* is that from the *Mulleri* Zone. Lower Anisian is possibly present in the poor faunas known from the Khabarovsk area. The *Karangatites* beds and the rather age-ambiguous *Leiophyllites pradyumna* Zone are reported from this area by OKUNEVA (1976) and OKUNEVA & JELEZNOV (1976). Co-occurrence of *Karangatites* with *Claraia* cf. *C. aranea* (TOZER) would illustrate the supposed long range of this ammonoid for *Claraia aranea* is considered as diagnostic of the late Spathian *Subrobustus* Zone (TOZER 1967; TOZER & PARKER 1968). Finally, the Primorye sequence (ZAKHAROV 1968) merely has no bearing on the problem, having no ammonoid record between its *Subcolumbites* beds and the ill-defined *Leiophyllites pradyumna* Zone.

5. Systematic descriptions[1]

Order *Ceratitida*
Superfamily **Xenodiscaceae** FRECH 1902
Family **Xenodiscidae** FRECH 1902
Genus *Hemilecanites* SPATH 1934

Hemilecanites cf. *H. paradiscus* KUMMEL

Plate 6, Figures 7–8, Text-Figure 3

Hemilecanites paradiscus KUMMEL 1969, p. 375, Pl. 29, Figs. 11–12; Pl. 31, Figs. 15–16 [holotype]; Pl. 35, Figs. 12.

Description. Moderately evolute, high whorled and compressed shell with an angular, nearly acute venter. Umbilical margin well defined, evenly sloping towards the umbilical suture. Outer flanks gradually converge towards the narrow venter. Surface smooth, with sinuous and slightly prorsiradiate growth striae. At D = 37 mm, H = 35%, W = 21% and U = 35%. The goniatitic suture line conforms to that of *H. paradiscus.*

Discussion. The few available specimens from the *Japonites welteri* beds are comparable to the species described by KUMMEL (1969) from the lowermost part of the Tobin Formation (*Subcolumbites* beds, USGS Mesozoic loc. M2562).

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[1]) The systematic descriptions follow the classification by TOZER (1981a). Repository of figured specimens is abbreviated USNM (National Museum of Natural History, Washington D.C.).

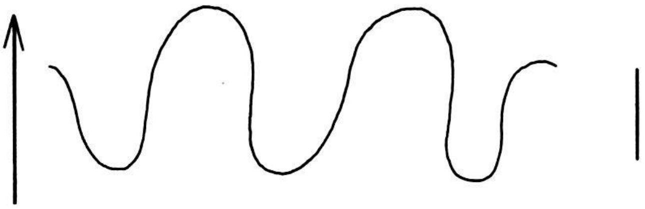

Fig. 3. Suture line (× 6) of *Hemilecanites* cf. *H. paradiscus* KUMMEL at D = 25 mm. Plesiotype USNM 438371.

Figured specimens. Plesiotypes USNM 438370 and 438371.

Occurrence. Loc. HB 184 (4), Star Creek Canyon, northern Humboldt Range. *Japonites welteri* beds, Lower Anisian.

Superfamily **Sagecerataceae** HYATT 1884
Family **Sageceratidae** HYATT 1884
Genus *Sageceras* MOJSISOVICS 1873

Sageceras cf. *S. walteri* MOJSISOVICS

Plate 4, Figures 13–14; Text-Figure 4

Sageceras walteri MOJSISOVICS 1882, p. 187, Pl. 53, Fig. 9a–9c [holotype], 11a–11b?, 12a–12b?, 13? SPATH 1934, p. 56, 58–59. SILBERLING & NICHOLS 1982, p. 18, Pl. 5, Figs. 10–12.

Sageceras gabbi MOJSISOVICS 1873. HYATT & SMITH 1905, Pl. 74, Figs. 8–9; Pl. 75, Figs. 14–15. SMITH 1914, Pl. 11, Figs. 8–9; Pl. 12, Figs. 14–15; Pl. 21, Figs. 18–20. SILBERLING 1962, p. 156.

Sageceras cf. *S. walteri* MOJSISOVICS. BUCHER 1988, p. 726, Fig. 2.

Description. Extremely oxycone shell, with a narrowly rounded venter on internal mold. Bicarination barely visible, only present on outer shell when preserved. Umbilicus extremely small but open. Surface of internal mold smooth. At D = 33 mm, H = 57–60%, W = 18–20% and U = 4–5%. Suture line with U-shaped bifid lobes and up to 5 adventitious lobes.

Discussion. There is no significant difference between the specimens collected from the *Mulleri* Zone and those recorded from the Middle and Upper Anisian strata (SILBERLING & NICHOLS 1982, p. 18; BUCHER 1988, Fig. 2). *Sageceras* cf. *S. walteri* thus ranges through the whole Anisian sequence of the Fossil Hill Member without any perceptible change.

Figured specimens. Plesiotypes USNM 438349 and 438350.

Occurrence. Loc. HB 56 (5), Coyote Canyon, northern Humboldt Range, Nevada. *Mulleri* Zone, Lower Anisian (occurrences from Middle and Upper Anisian not listed).

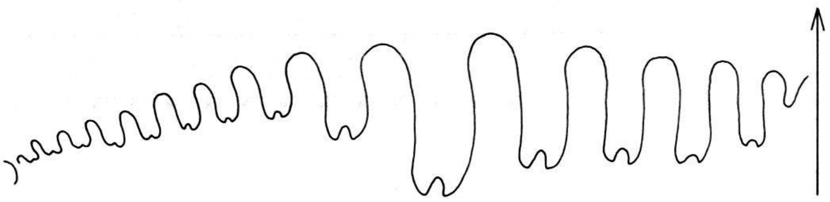

Fig. 4. Suture line (× 6) of *Sageceras* cf. *S. walteri* MOJSISOVICS at H = 15 mm. Plesiotype USNM 438349.

Superfamily **Dinaritaceae** Mojsisovics 1882
Family **Dinaritidae** Mojsisovics 1882
Subfamily **Khvalynitinae** Shevyrev 1968
Genus *Metadagnoceras* Tozer 1965

Metadagnoceras sp. indet.

Plate 1, Figure 1

Description. Although tectonically deformed, a single specimen from the *Japonites welteri* beds can be referred to this genus. It mainly consists of a fragmentary body chamber with its diagnostic first low rounded and then tabulate venter and with its discrete strigation still visible on outer flanks. Shell otherwise smooth and relatively thick whorled. Suture line not known.

Discussion. This specimen does not provide enough characters for identification at the species level. However, it can easily be distinguished from *Alanites* Shevyrev by absence of flared umbilical margins, foldlike falcoid ribs and rounded venter. This form differs from *Metadagnoceras youngi* n. sp. by its thicker whorls and smooth flanks. It stands comparatively closer to *M. pulchrum* Tozer than to *M. youngi* n. sp.

Figured specimens. USNM 438308.

Occurrence. Loc. HB 184 (1), Star Creek Canyon, northern Humboldt Range, Nevada. *Japonites welteri* beds, Lower Anisian.

Metadagnoceras youngi n. sp.

Plate 1, Figures 2–5; Text-Figure 5

Description. Relatively compressed *Metadagnoceras* with a low rounded venter. Whorl section high, subrectangular with flanks first subparallel and then gently converging towards venters. Ornamentation consists of dense, weak sinuous ribs that fade on outer flanks. Because outer shell is not preserved, a possible strigation could not be observed. At $31<D<45$ mm, $47<H<49\%$ and $19<U<22\%$. Although quite variable, the suture line conforms to that of *Metadagnoceras* (Tozer 1965, Fig. 9). The last visible suture lines of the holotype (Fig. 5a) overlap in their umbilical part thus indicating an essentially complete and mature phragmocone. They are characterized by a wide, relatively shallow and finely incised single lateral lobe. The ventral lobe is apparently strongly reduced. The lateral saddle has a crude rectangular outline with a wavy tip. It is also intersected by the umbilical edge and suture. The same sutural pattern also extend to smaller diameters (Fig. 5b). The last suture line of another mature specimen (Fig. 5c) from the same locality shows some differences with that of the holotype. It's lateral lobe is comparatively narrower with less numerous but larger indentations. Its lateral saddle is equally narrower, with a well rounded tip and is not concealed by whorl overlaping.

Discussion. Out of 8 specimens from loc. HB 56, only 2 have suture lines that do not conform to that of the holotype (see description above). Although poorly preserved, they do not obviously differ in their general shape from that of the holotype. It thus seems preferable to group them provisionally under the same species name because the few available specimens do not permit assessment of sutural variability.

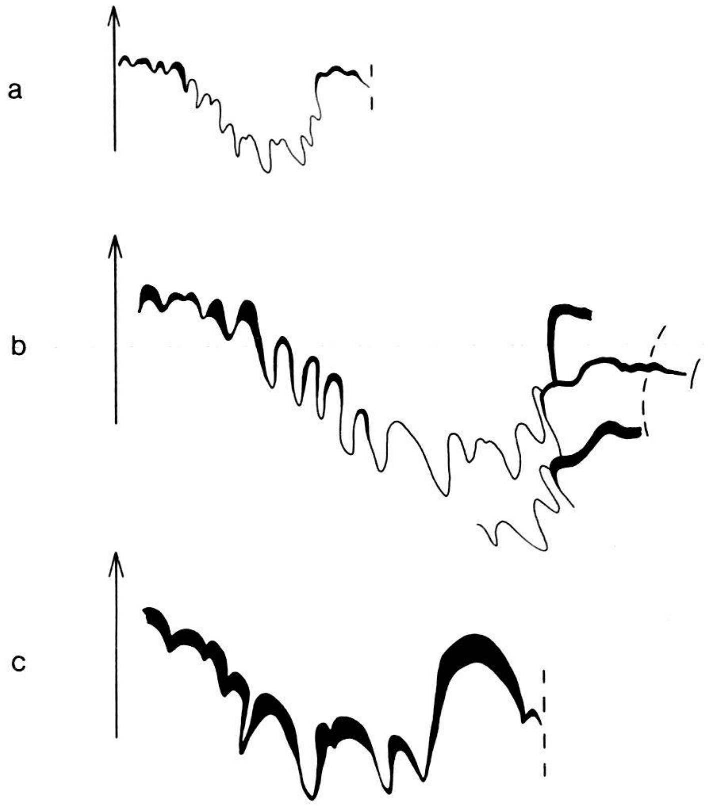

Fig. 5. Suture lines (× 3) of *Metadagnoceras youngi* n. sp. a: H = 9 mm; b: H = 19 mm; Holotype USNM 438310. c: H = 15 mm; Paratype USNM 438312.

Metadagnoceras youngi is invariably distinguished from all Spathian congeneric species (see review by KUMMEL 1969; see also *M. amidii* TOZER 1972a) by its compressed shell shape and its suture line. Distinctive features of the latter are the loss of a well individualized first lateral saddle, the wide and shallow first lateral lobe provided with numerous indentations and a residual ventral lobe. Among the Spathian form revised by KUMMEL (op. cit.), only *M. pulchrum* TOZER (occurrences from both *Subrobustus* and *Haugi* Zones) shows a reduced first lateral lobe along with a relatively shallow first lateral saddle. This trend is even more accentuated with *M. rotundum* WANG from Ziyun (WANG 1978, Text-Fig. 5b, Pl. 2, Figs. 4–7) which yet differs from *M. youngi* by its smooth and trigonal whorl shape. *M. youngi* is easily distinguished from the younger *Alanites mulleri* SILBERLING & NICHOLS (Lower *Hyatti* Zone) by its suture line, but apart from the absence of flared umbilical margins, it has somewhat comparable gross whorl proportions. In spite of its shell shape, generic attribution of this new species to *Metadagnoceras* is supported by its characteristic suture line.

Species named for D. YOUNG of New Pass Mine, Nev.

Figured specimens. Holotype USNM 438310, paratypes USNM 438309, 438311 and 438312.

Occurrence. Loc. HB 56 (8), Coyote Canyon, northern Humboldt Range, Nevada. *Mulleri* Zone, Lower Anisian.

Superfamily **Megaphyllitaceae** Mojsisovics 1896
Family **Parapopanoceratidae** Tozer 1971
Genus *Stenopopanoceras* Popov 1961

Stenopopanoceras sp. indet.
Plate 2, Figure 6

Description. A single incomplete specimen conforms to this genus. It has the diagnostic concentric coiling of *Stenopopanoceras* and is compressed and moderately evolute (at D = 42 mm, H = 37%, W = 29% and U = 30%). The arched venter on the penultimate whorl becomes bluntly angular on the ultimate whorl, thus probably indicating transition to the body chamber. Concave, prorsiradiate growth striae barely visible on the outer shell. Suture line too poorly preserved to be drawn.

Discussion. Stenopopanoceras is here first reported from the Nevada Anisian sequence. By its general shell shape, this specimen resembles involute representatives of *Stenopopanoceras* such as *S. transiens* Tozer and *S. primulum* Popov. The poor state of preservation and failure in obtaining the suture line prevent which one of these two species the Nevada specimen should be referred to. Comparison with *S. zvetkovi* (Popov), which has thicker whorls and even greater involution, must be ruled out (see Dagys & Ermakova 1981 for a comprehensive study of Siberian *Parapopanocertidae*).

Figured specimens. USNM 438324.

Occurrence. Loc. HB 96 (1), Coyote Canyon, northern Humboldt Range, Nevada. Talus block derived from Lower Anisian strata above the *Pseudokeyserlingites guexi* beds.

Superfamily **Ceratitaceae** Mojsisovics 1879
Family **Sibiritidae** Mojsisovics 1886
Subfamily **Keyserlingitinae** Zakharov 1970

Genus *Pseudokeyserlingites* n. gen.

Type species. Pseudokeyserlingites guexi n. sp.

Description. Keyserlingitid with shallow bisulcate and roughly serraticarinate venter on inner whorls. Carination persists whereas the sulci fade on outer whorls. Venter strongly adorned by dense, chevron-shaped ribs that cross the keel thus defining a crude, wavy serration. Whorl section at first coronate and then subhexagonal.

Composition of the genus. Pseudokeyserlingites guexi n. sp.

Discussion. The unique ventral pattern of *Pseudokeyserlingites* enables making generic distinction with the otherwise overall comparable *Keyserlingites* Hyatt (= *Durgaites* Diener). *Pseudokeyserlingites* has much more affinities with *Keyserlingites* than with *Olenekoceras,* a clearly distinct genus which unites varied species of the *middendorfi* group (Dagys & Ermakova 1986). *Pseudokeyserlingites* differs from *Taimyrites* of the Siberia *Tardus* Zone (Vavilov & Arkadiev 1986) by its subhexagonal whorl section, its spinose tuberculation and its serraticarinate venter. According to Tozer (written com. 1989), *Taimyrites* is regarded as a better representative of *Groenlanditinae* than of *Danubitidae* as initially proposed by Vavilov & Arkadiev (1986).

Pseudokeyserlingites guexi n. sp.

Plate 2, Figures 2–5; Text-Figure 6

Description. Innermost whorls carinate and bisulcate. At this growth stage, keel and ventral furrows apparently evenly smooth. With increasing shell size, keel changes rapidly into a low rounded, crudely serrated shape. Linked with development of ventral ribbing, furrows become simultaneously shallower. On strongly divergent flanks, slightly sigmoidal, faint looped ribs merge at both ends of crescentic, flat-topped tubercles placed on outer flanks. The width of the rather diffuse adapical rib increases outwards whereas the adoral rib is frequently reduced to clustered growth striae. The crescentic scars and the flat top of tubercles go together with the presence of hollow spines. These usually break away during extraction but are preserved on inner whorls of the holotype. Up to 3 stout prorsiradiate ribs branch from the tubercles and further enlarge into ventrolaral swellings. Then, they cross the ventral furrows with decreasing strength and meet the keel at an angle of about 100–120°. The largest available specimen, although still immature, has an estimated diameter of about 10 cm. Suture line imperfectly known but with a proportionally oversized first lateral saddle.

Discussion. Relatively coarse, U or V-shaped ventral ribbing is a character already encountered among some representatives of *Keyserlingites.* For instance, this noticeable feature is shared by *K. dieneri* (Mojsisovics) and *K. qinghaiensis* Wang but both contrast from *Pseudokeyserlingites* in lacking the keel. The keeled *"Ceratites* nov. sp. ind. from *C. robusti* group" (Diener 1895, Pl. 5, Fig. 6) was later removed from keyserlingitids on safer grounds by Diener himself (1905, p. 788). In fact, both suture line and whorl section evidently preclude relationships of any kind with keyserlingitids. Much closer are the specimens from Qinghai referred as *"Gymnotoceras"* sp. by Wang and others (1979, p. 31, Pl. 7, Figs. 27–34). From their illustrations and suture line, one can state that these specimens are by no means comparable to beyrichitids but strikingly resemble *Pseudokeyserlingites. "Gymnotoceras"* sp. was found to be associated with other ammonoids out from which no definite age can be inferred. The co-occurring alleged *Gymnotoceras* sp. (Wang and others 1979, p. 31, Pl. 7, Figs. 24–26) is not well enough preserved for unambiguous generic identification and the accompanying *Gymnites* is a rather long ranging genus. Unfortunately, there is no further mention of this *"Gymnotoceras"* sp., even in the synonymy lists, in the paper by He and others (1986) on Lower and Middle Triassic ammonoids of Central Qinghai.

Pseudokeyserlingites guexi may presumably be regarded as an offshoot of the equally low paleolatitude *Keyserlingites dieneri* stock.

Species named for J. Guex of the Institute of Geology and Paleontology, Lausanne University.

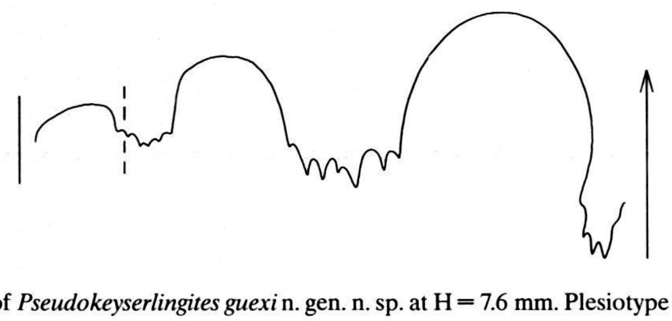

Fig. 6. Suture line (× 6) of *Pseudokeyserlingites guexi* n. gen. n. sp. at H = 7.6 mm. Plesiotype USNM 438321.

Figured specimens. Holotype USNM 438323, paratype USNM 438322, plesiotypes USNM 438320 and 438321.

Occurrence. Loc. HB 138 (2), HB 223 (1), HB 250 (1), Coyote Canyon; HB 251 (1) and single float specimen found above the *Japonites welteri* beds, Bloody Canyon, northern Humboldt Range. USGS Mesozoic loc. M1599 (1), Inyo Range, California. *Pseudokeyserlingites guexi* beds, Lower Anisian.

Subfamily **Silberlingitinae** n. subfam.

Genus *Silberlingites* n. gen.

Type species. Silberlingites mulleri n. sp.

Description. Shell compressed and permanently keeled. Allowing for some variation, ontogenetic pathway undergoes at least three basic stages, the first and third of which are markedly contrasted and separated by a second, somewhat transitional and brief stage. Innermost whorls coronate, provided with one or two rows of hollow spine-bearing tubercles on outer flanks or at ventrolateral margin. The smooth, partially hollow floored keel may be occasionally bordered by two furrows. On flanks, the strength of diffuse rectiradiate ribs increases towards the parabolic, flat-topped, spine-bearing tubercles. From them stem an usually single, very sharply projected rib that rapidly fades on venter. With further increase in shell size, whorl section gradually becomes first subquadrate and then subrectangular. During this second stage, tuberculation progressively fades and then completely disappears. Below tubercles, ribs become much better defined and are commonly looped. Additional intercalatory ribs may even develop between groups of looped ribs. The resulting pattern is a much denser, more or less rursiradiate ribbing. At the end of this stage, ribbing becomes uniform, going together with the progressive loss of ventrolateral tubercles and possible ventral furrows. At beginning of last stage, whorl height has considerably increased and slightly convex flanks grade evenly into the narrowly arched, permanently carinate venter. The extension of thin, projected and occasionally fasciculate ribs to larger diameters depends on initial strength of ribbing. These commonly wear off before the end of mature phragmocone and only similarly pathed growth striae subsist at transition to body chamber. This third stage apparently still prevails on the imperfectly known body chamber. The latter does not display any further notable modifications aside from short umbilical margins and gentle ventral shoulders. Suture line ceratitic. Lobe-endings commonly if not invariably truncated by sutural overlapping on last half whorl of mature phragmocone. Ventral lobe with a single, narrow indentation and as deep as the finely crenulated lateral lobe. Umbilical lobe reduced to a single indentation. Dorsal lobe lituid.

Composition of the genus. Silberlingites mulleri n. sp., *Silberlingites tregoi* n. sp.

Discussion. Silberlingites embodies a unique combination of characters quite unlike that of any previously known Triassic genus. Its innermost whorls suggest affinity with *Pseudokeyserlingites* but the rest of the shell is so profoundly altered that it justifies introduction of a new subfamily among *Sibiritidae.* Partial resemblances between *Silberlingites* and Spathian hellenitids or Lower Anisian groenlanditids such as *Taimyrites* are probably not of phylogenetic significance.

Genus named for N. J. Silberling of the U.S. Geological Survey at Denver.

Silberlingites mulleri n. sp.

Plate 3, Figures 1–11; Plate 4, Figures 1–4; Text-Figure 7

Description. Silberlingites with a single row of tubercles placed on outer flanks. Inner whorls usually devoid of ventral furrows. However, these furrows may occur on some rare variants but are then rather shallow. Population obtained from locality HB 56 exhibits a considerable range of variability regarding the extension of the two tuberculated stages. Figure 8 shows that the frequency distribution of maximal umbilical width corresponding to the last tubercle fits a normal distribution. Strength of both tuberculation and ribbing obviously depends on the maximal diameter attained by the two first stages. The second stage may also be drastically abbreviated on some variants. H% and U% are respectively plotted on Figures 9 and 10. Suture line with relatively elongated saddles whose walls are subparallel.

Discussion. Silberlingites mulleri is distinguished from *S. tregoi* by the characters of its two first stages. These have a single row of comparatively larger tubercles, a less well defined ribbing and more markedly coronate whorl section.

Species named in honor of the late S. W. MULLER.

Figured specimens. Holotype USNM 438327, paratypes USNM 438326, 438428 to 438340.

Occurrence. Loc. HB 56 (81), HB 59 (5), HB 115 (2), Coyote Canyon, northern Humboldt Range. *Mulleri* Zone, Lower Anisian.

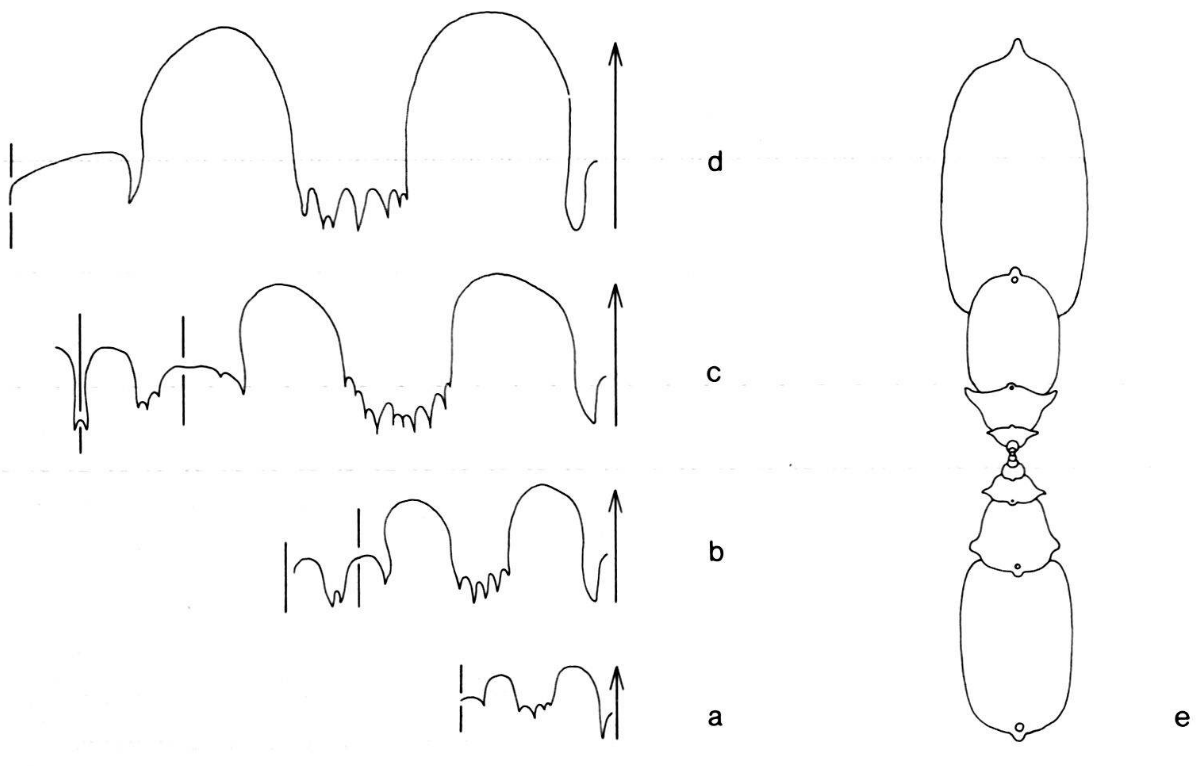

Fig. 7. *Silberlingites mulleri* n. gen. n. sp. Loc. HB 56, *Mulleri* Zone, Coyote Canyon. Suture lines (× 3) a: H = 3.8 mm; Paratype USNM 438386 (specimen not figured). b: H = 6.6 mm; Paratype USNM 438385 (specimen not figured). c: H = 14 mm; Paratype USNM 438384 (specimen not figured). d: H = 20 mm; Paratype USNM 438337 (specimen not figured). Section (× 1.5) e: Paratype USNM 438387 (specimen not figured).

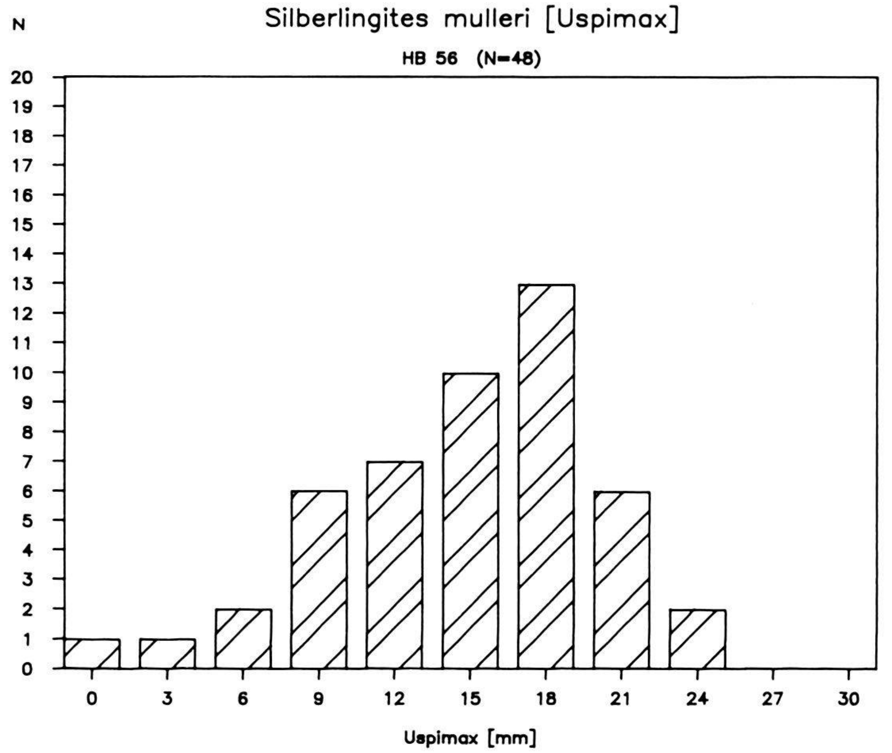

Fig. 8. Frequency distribution of maximal umbilical width of spinose stage [Uspimax] for 48 specimens of *Silberlingites mulleri* n. gen. n. sp. from locality HB 56 in the *Mulleri* Zone; Coyote Canyon.

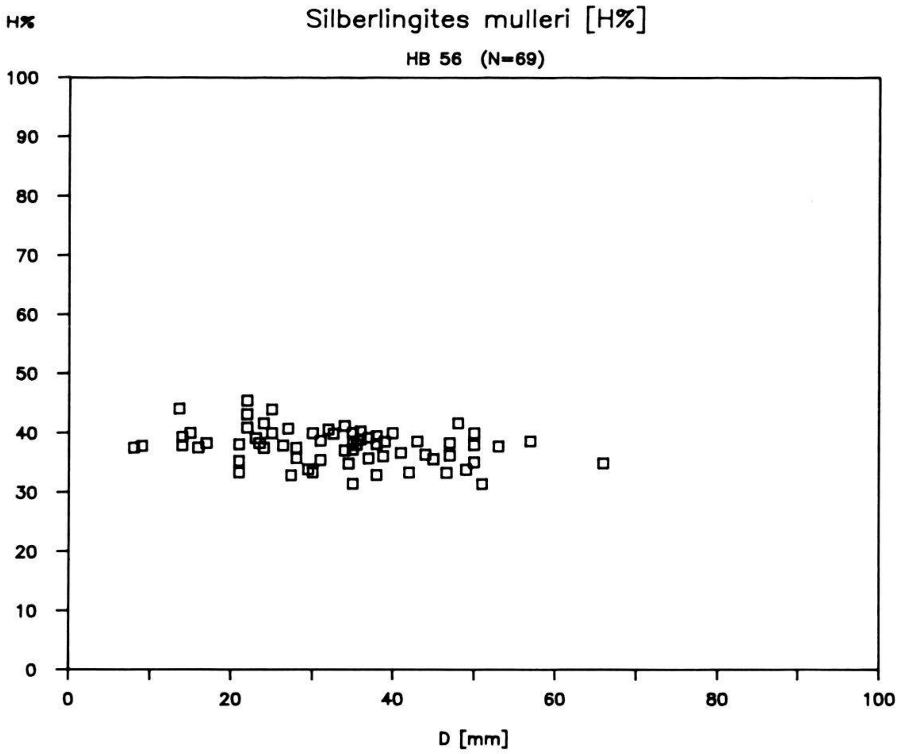

Fig. 9. Scatter diagram of H% against corresponding diameter for 69 specimens of *Silberlingites mulleri* n. gen. n. sp. from locality HB 56 in the *Mulleri* Zone; Coyote Canyon.

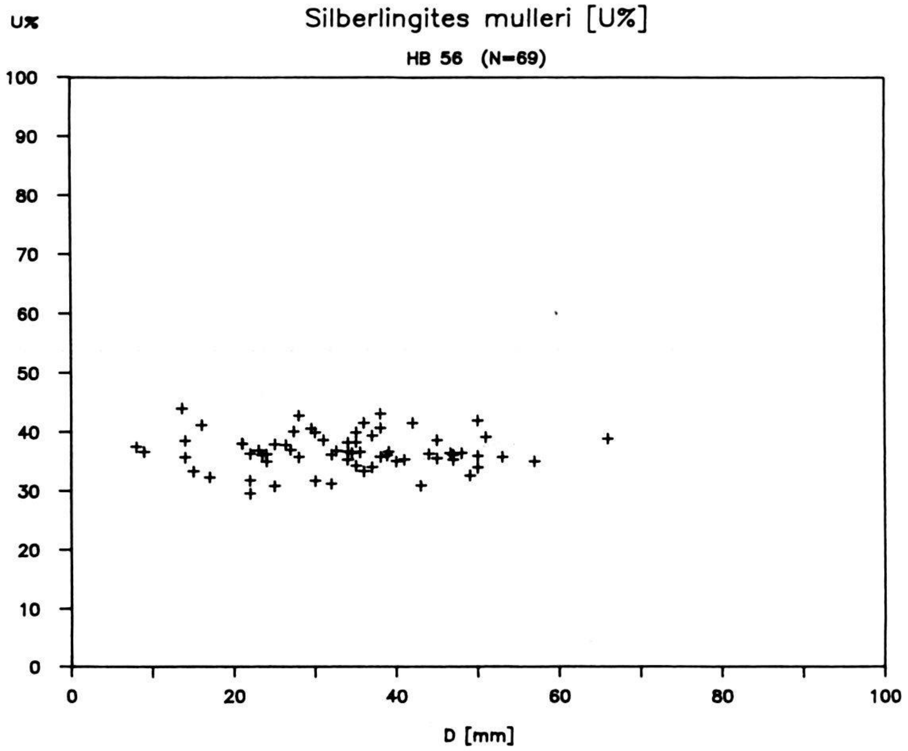

Fig. 10. Scatter diagram of U% against corresponding diameter for 69 specimens of *Silberlingites mulleri* n. gen. n. sp. from locality HB 56 in the *Mulleri* Zone; Coyote Canyon.

Silberlingites tregoi n. sp.

Plate 4, Figures 5–12; Text-Figure 11

Description. Silberlingites with two rows of spine-bearing tubercles placed respectively on outer flanks and at ventrolateral margin. At the end of the usually short first stage, whorl section at first slightly coronate, rapidly changes into a subquadrate outline. Ventrolateral spines simultaneously gain further strength and are deeply printed in the umbilical margin of the next overlapping whorl. At this comparatively much longer second stage, both single and looped ribs are prominent and occasionally slightly rursiradiate. Short ventral ribs sharply projected and fading along ventral furrows. Both lateral and ventrolateral spines gradually lose their strength but ventrolateral tuberculation lasts comparatively longer. Transition to the third stage is enhanced by definitive obliteration of ribbing and ventrolateral tuberculation. Whorl section is then compressed and subrectangular.

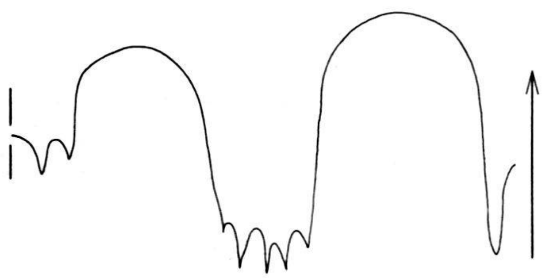

Fig. 11. Suture line (× 6) of *Silberlingites tregoi* n. gen. n. sp. at D = 18.5 mm. Plesiotype USNM 438342.

Discussion. Silberlingites tregoi differs from *S. mulleri* in having bituberculated inner whorls. At first and second stages, *S. tregoi* is usually more evolute and less deeply umbilicated than *S. mulleri*. Their third respective stages are identical. The suture line of *S. tregoi* does not differ from that of *S. mulleri*.

Species named for Mrs. P. TREGO of Unionville, Nev.

Figured specimens. Holotype USNM 438344, paratypes USNM 438341 to 438343, 438346 and 438348, plesiotypes USNM 438345 and 438347.

Occurrence. Loc HB 56 (10), HB 59 (3), HB 88 (1), HB 115 (2), Coyote Canyon, northern Humboldt Range. *Mulleri* Zone, Lower Anisian.

Family **Acrochordiceratidae** ARTHABER 1911
Genus *Paracrochordiceras* SPATH 1934

Paracrochordiceras sp. indet.

Plate 1, Figures 8–10

Description. This form is represented by 3 fragments which are highly suggestive of *Paracrochordiceras*. They are characterized by a very slightly sinuous, mainly plicate ribbing. The strength of densely and regularly spaced ribs increases evenly towards outer flanks, with a conspicuous projection at-or near ventrolateral margin. The less poorly preserved specimen shows a subrectangular whorl section with a subtabulate venter and a short, abrupt umbilical margin. The same specimen bears bi- or trifurcated ribs, the apical rib of which being the most pronounced on inner flanks. Branched ribs quickly become of equal strength on mid- and outer flanks. Though eroded, a few ribs may possibly bifurcate again at ventral shoulders. Suture line not known.

Discussion. The few available specimens do not enable identification at the species level. Their regular plicate ribbing makes distinction with *P. silberlingi* n. sp., *P. americanum* McLEARN and *P. mclearni* n. sp. very likely. These early representatives of *Paracrochordiceras* roughly share a common style of ribbing with *P. plicatus* n. sp. and *P. anodosum* WELTER but apparently lack the well rounded inner whorls. They differ from *Proacrochordiceras* as defined by KORCHINSKAYA (1982, 1984) by having denser and finer ribbing.

Figured specimens. USNM 438315 to 438317.

Occurrence. Loc. HB 235 (2), Coyote Canyon, northern Humboldt Range. *Japonites welteri* beds, Lower Anisian. Single isolated float specimen found at the lower limit of the Fossil Hill Member in the Congress Canyon, northern Humboldt Range; probably derived from the same horizon.

Paracrochordiceras silberlingi n. sp.

Plate 1, Figures 6–7; Text-Figure 12

Description. Paracrochordiceras with dense and sharp, crestate ribbing. Shell moderately evolute, with stout whorls, a little thicker than they are high and with a low, broadly arched venter. Ribbing is typically convex on phragmocone of the immature holotype. On innermost whorls, a few ribs bifurcate from discrete lateral nodes occurring about 4 to a whorl. Parabolic scars are barely visible on the nodes. At later stage,

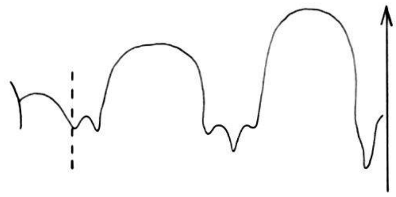

Fig. 12. Suture line (× 6) of *Paracrochordiceras silberlingi* n. sp. at D = 13 mm. Holotype USNM 438314.

some ribs are trifurcate, the first branching point being placed on inner flanks, the second at ventral shoulders. With further increasing in shell size, there is no more evidence of nodes placed at branching points. All ribs are uniform in strength and cross the venter to form a slight sinus. A conspicuous feature of the phragmocone are hollow ribs. On inner mould of phragmocone, ribs have a truncated crest and fade when crossing the siphonal line whereas the outer test is sharply but regularly folded. The hollow space thus created just below the top of outer test crests is evidenced by distinct sparitic fillings. This discrepancy between inner mould and outer test of phragmocone results in the presence of a preseptal layer (GUEX 1970; TOZER 1972b) still partially preserved on the holotype. On the body chamber, ribs are rectiradiate and more pronounced, specially on venter. Some ribs are then quadrifurcate, recalling a reverse virgatotome type of ribbing. At a diameter of 26 mm (body chamber of the immature holotype), H = 35%, W = 46% and U = 42%. Immature suture line ceratitic, with crudely indented lobes.

Description. Shell shape and suture line conform to these of *Paracrochordiceras.* Distinguished from all other congeneric species in having a very sharp ribbing with up to 4 branched ribs simulating a reverse virgatotome type of ribbing.

Species named for N. J. SILBERLING of the U.S. Geological Survey at Denver.

Figured specimens. Holotype USNM 438314, paratype USNM 438313.

Occurrence. Loc. HB 223 (2), Coyote Canyon; northern Humboldt Range. *Pseudokeyserlingites guexi* beds, Lower Anisian.

Paracrochordiceras cf. *P. americanum* McLEARN

Plate 7, Figures 3–5; Text-Figure 13

Acrochordiceras (Paracrochordiceras) americanum McLEARN 1946, p. 3, Pl. 5, Fig. 1. McLEARN 1969, p. 12, Pl. 1, Figs. 1–3.

[not] *Paracrochordiceras* aff. *P. americanum* McLEARN, SILBERLING & TOZER 1968, p. 38. SILBERLING & WALLACE 1969, p. 17, Tabl. 1.

[not] *Paracrochordiceras americanum* McLEARN, SILBERLING & NICHOLS 1982, p. 21, Pl. 29, Figs. 1–9.

Description. Relatively evolute and compressed *Paracrochordiceras.* Innermost whorls slightly depressed and frequently bearing small, discrete lateral parabolic nodes. Further development shows rapid transition to subquadrate or subrectangular whorl section together with loss of nodes. Ribbing is then weak and consists of mainly single ribs that cross the venter with variable strength. A few of them may occasionally bifurcate on inner or at mid-flanks. On outer whorls, some specimens show flexuous, somewhat slightly concave ribbing. At D = 30 mm, H = 28–33%, W = 30–33% and U = 43–47%. The largest known mature specimen has a diameter of about 65 mm. Suture line ceratitic with a wide and deeply crenulated first lateral lobe.

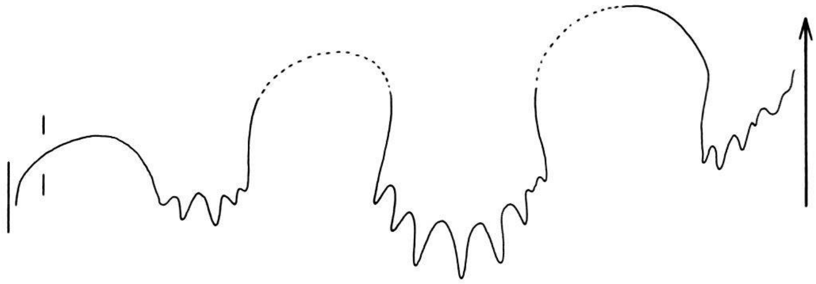

Fig. 13. Suture line (× 6) of *Paracrochordiceras* cf. *P. americanum* McLearn at H = 13 mm. Plesiotype USNM 444087 (specimen not figured). Loc. HB 56, *Mulleri* Zone; Coyote Canyon.

Discussion. Among the various *Paracrochordiceras* from the Nevada Anisian sequence, those presently discussed are the most comparable with the holotype of *P. americanum* which was originally described from the lower part of the *Caurus* Zone of British Columbia. Both share a relatively evolute coiling with subrectangular whorl section and a generally thin ribbing that can not be properly labeled plicate. It must also be mentioned that close examination of the holotype equally suggests presence of discrete lateral nodes on innermost whorls. *P. americanum* is thus distinguished from *P. plicatus* of the Nevada *Caurus* Zone by its thinner, less typically plicate ribbing, its more compressed whorl section and more evolute coiling.

Figured specimens. Plesiotypes USNM 438374 to 438376.

Occurrence. Loc. HB 56 (14), HB 91 (2), HB 115 (3), HB 88 (1), Coyote Canyon, northern Humboldt Range. *Mulleri* Zone, Lower Anisian.

Paracrochordiceras mclearni n. sp.

Plate 7, Figures 6–7; Text-Figure 14

Description. Evolute *Paracrochordiceras* with well rounded whorl section. Rather week and flexuous ribbing fade on venter. Up to 5 conspicuous parabolic lateral nodes to a whorl are linked up from the two sides by a peristomal scar. At D = 27 mm (holotype), H = 29%, W = 37% and U = 48%. Suture line ceratitic, with a proportionnally large sized first lateral lobe.

Discussion. Distinguished from the coeval *P.* cf. *P. americanum* by the rounded whorl section, the much weaker ribbing and the parabolic nodes that extend up to 25 mm in diameter.

Species named in honor of the late F. H. McLearn.

Figured specimens. Holotype USNM 438377, plesiotype USNM 438378.

Occurrence. Loc. HB 56 (3), HB 95 (2), Coyote Canyon, northern Humboldt Range. *Mulleri* Zone, Lower Anisian.

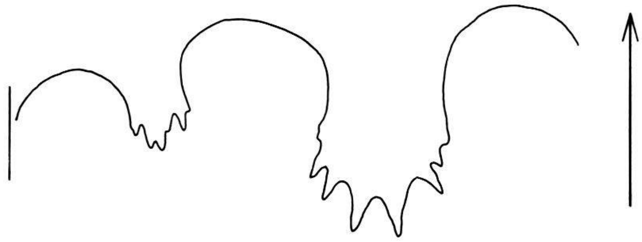

Fig. 14. Suture line (× 6) of *Paracrochordiceras mclearni* n. sp. at D = 25 mm. Plesiotype USNM 438378.

Paracrochordiceras plicatus n. sp.

Paracrochordiceras aff. *P. americanum* McLearn, Silberling & Tozer 1968, p. 38. Silberling & Wallace 1969, p. 17, Tabl. 1.

Paracrochordiceras americanum McLearn, Silberling & Nichols 1982, p. 21, Pl. 29, Figs. 1 [holotype, here designated] to 9.

Description. Moderately evolute *Paracrochordiceras* with true plicate ribbing. Strength of ribbing usually increases on venter. Inner whorls depressed, with parabolic nodes. Transition to outer whorls is shown by gradual change of whorl section into a subquadrate to subrectangular outline.

Discussion. Differs from *P.* cf. *P. americanum* and *P. mclearni* in having a more involute coiling, thicker whorls and a true plicate ribbing; from *P.* sp. indet. by its rounded inner whorl section.

Occurrence. USGS Mesozoic localities M 2358 (9), M 2362 (1?), M 2367 (3), M 2828 (1?). Loc. HB 180 (3), Star Creek, Bloody and Coyote Canyons, northern Humboldt Range. *Caurus* Zone, Lower Anisian.

Superfamily **Danubitaceae** Spath 1951
Family **Danubitidae** Spath 1951
Genus *Paradanubites* Shevyrev 1968

Paradanubites crassicostatus n. sp.

Plate 7, Figure 8

Description. Shell serpenticone, with rather indistinct umbilical margin and broadly arched venter. Ribbing simple, coarse, somewhat bulbous and slightly prorsiradiate but fading on venter. From what is left of the body chamber, it shows notable whorl height increasing in that differing from the subquadrate preceding whorls. On body chamber, ribbing changes into a more or less concave path. At D = 62 mm, H = 26%, W = 27% and U = 48%. Suture line not known.

Discussion. Though suture line could not be obtained, this form is distinguished from *Paracrochordiceras* by its very slowly increasing whorl height and absence of nodes. *P. crassicostatus* differs from *P. alternecostatus* (Welter), *P. naumanni* (Mojsisovics) and *P. kansa* (Diener) by its even more serpenticone coiling and stouter ribbing; from *Danubites (?Paradanubites) tozeri* Korchinskaya by its coarser ribbing.

Figured specimens. Holotype USNM 438379.

Occurrence. Loc. HB 56 (1), Coyote Canyon, northern Humboldt Range. *Mulleri* Zone, Lower Anisian.

Family **Longobarditidae** Spath 1951
Subfamily **Groenlanditinae** Assereto 1966
Genus *Groenlandites* Kummel 1966

Groenlandites pridaense n. sp.

Plate 5, Figures 5–10; Text-Figure 15

Description. Inner whorls relatively evolute, depressed, with lateral tuberculation of variable strength, ranging from weak radial folds to blunt nodes. Venter broadly arched and perfectly smooth. Allowing for some variability, transition to inflated oxycone stage generally occurs at an average diameter of about 10 mm. Venter becomes then bluntly angular or nearly acute but not carinate. More or less convex ribbing gradually decreases but subsists comparatively longer on inner flanks. H%, W% and U=% are respectively plotted on Figures 16, 17 and 18. Suture line with quite variable number of auxiliary elements (2 to 5).

Discussion. Less inflated and with earlier transition to oxycone stage than *G. nielseni* KUMMEL, *G. astachovae* VAVILOV and *G. merriami* n. sp.

Species name derived from the Prida Formation.

Figured specimens. Holotype USNM 438359, paratypes USNM 438357 and 438358, plesiotypes USNM 438355, 438356, 438360.

Occurrence. Loc. HB 56 (36), HB 115 (5), HB 222 (26), 59 (2), HB 95 (5), Coyote Canyon, northern Humboldt Range. *Mulleri* Zone, Lower Anisian.

Groenlandites merriami n. sp.

Plate 5, Figure 11

Description. A single mature specimen refers to this species. Whorl section subtrigonal and inflated at end of phragmocone, with a blunt angular venter. On inner flanks, diffuse bullae are made up by groups of 2 or 3 closely spaced and swollen ribs. Both clustered and intercalated ribs fade near or at ventrolateral margin. The last half-whorl (incomplete body chamber) first shows, single, convex ribs that gradually weaken and become flexuous at end of ultimate whorl. Simultaneous changes of whorl section result in considerable increase in height, a short and steep umbilical margin and a less angular periphery. At D=46 mm, H=50%, W=33% and U=19%. Suture line not known.

Discussion. Distinguished from *G. nielseni* KUMMEL in having a less acute venter, a more compressed body chamber and more pronounced ribbing; from *G. astachovae* VAVILOV and *G. pridaense* n. sp. by its larger size and more robust shape.

Species named in honor of the late J. C. MERRIAM.

Figured specimens. Holotype USNM 438361.

Occurrence. Loc. HB 225 (1), Bloody Canyon, northern Humboldt Range. *Caurus* Zone, Lower Anisian.

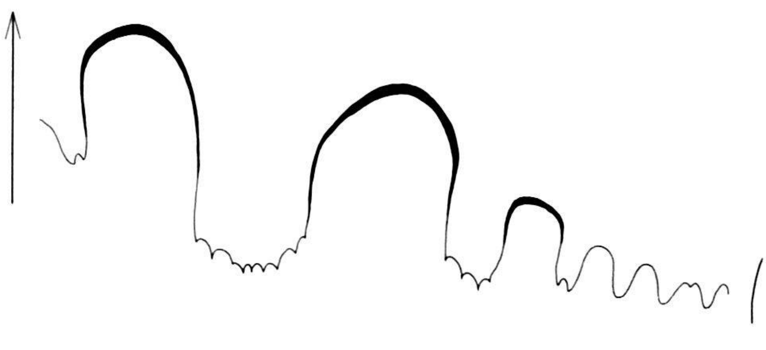

Fig. 15. Third before last suture line (×6) of *Groenlandites pridaense* n. sp. at D=23.5 mm. Holotype USNM 438359.

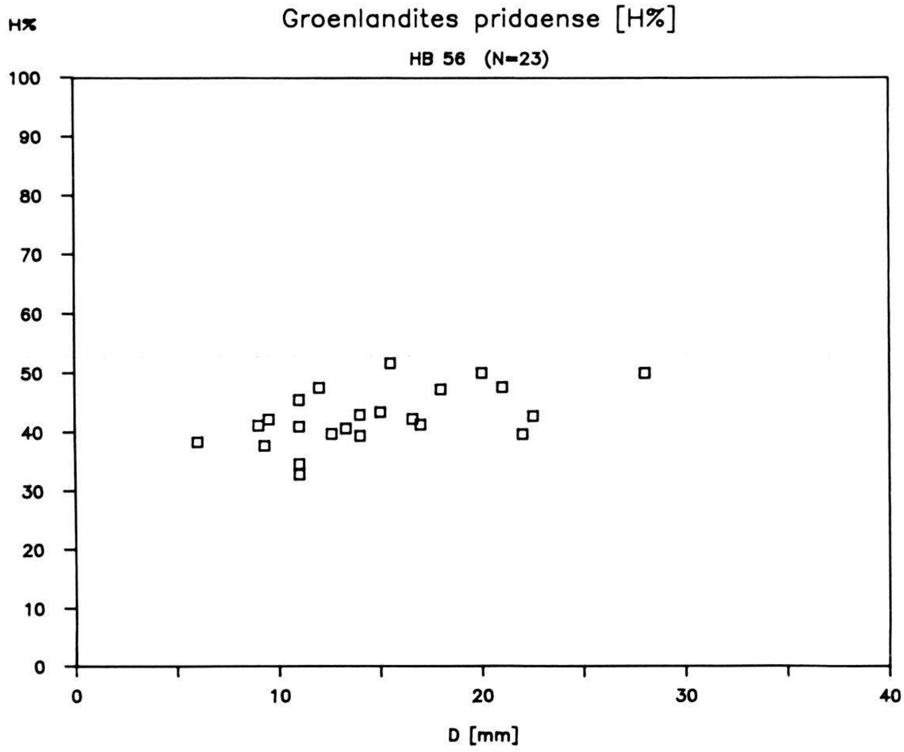

Fig. 16. Scatter diagram of H% against corresponding diameter for 23 specimens of *Groenlandites pridaense* n. sp. from locality HB 56 in the *Mulleri* Zone; Coyote Canyon.

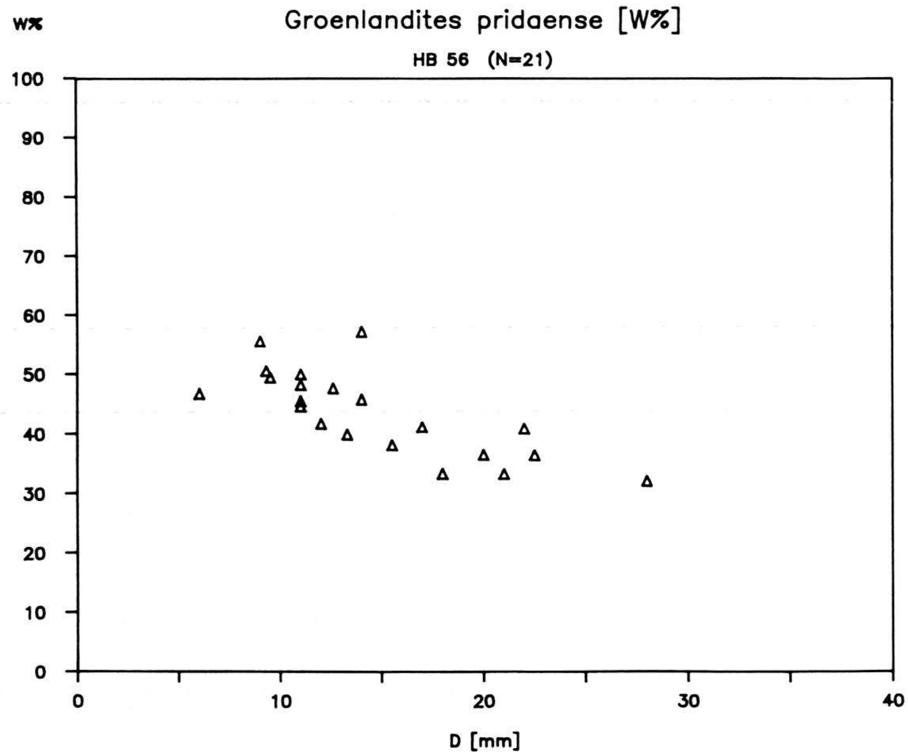

Fig. 17. Scatter diagram of W% against corresponding diameter for 21 specimens of *Groenlandites pridaense* n. sp. from locality HB 56 in the *Mulleri* Zone; Coyote Canyon.

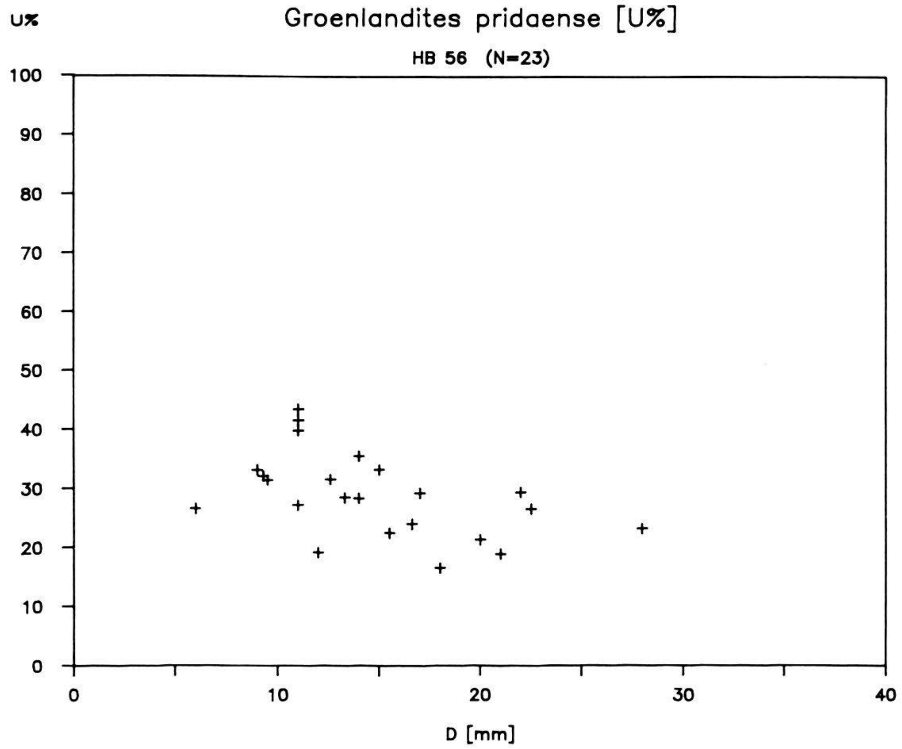

Fig. 18. Scatter diagram of U% against corresponding diameter for 23 specimens of *Groenlandites pridaense* n. sp. from locality HB 56 in the *Mulleri* Zone; Coyote Canyon.

Subfamily **Longobarditinae** SPATH 1951
Genus *Grambergia* POPOV 1961

Grambergia sp. indet.

Plate 5, Figures 12–13; Text-Figure 19

Description. Innermost whorl (D<7–10 mm) moderately evolute and smooth. Outer whorls (D>10 mm) extremely oxycone, smooth and with an occluded umbilicus. At D = 21 mm, H = 62% and W = 26%. Suture line with 5 auxiliary elements and crudely indented lobes.

Discussion. Differs from all other congeneric species by very early acquisition of oxycone stage and occluded umbilicus.

Figured specimens. USNM 438362 and 438363.

Occurrence. Loc. HB 56 (3), HB 94 (5), HB 59 (1), Coyote Canyon, northern Humboldt Range. *Mulleri* Zone, Lower Anisian.

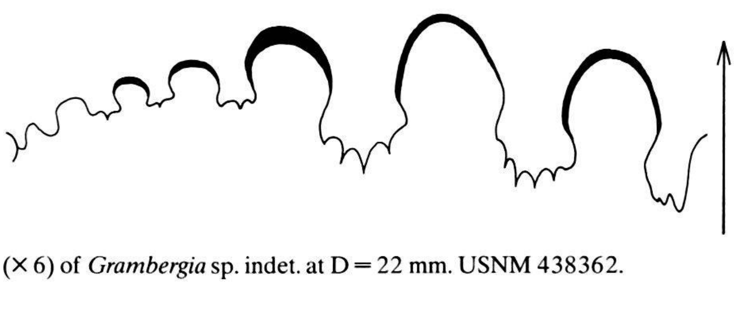

Fig. 19. Suture line (× 6) of *Grambergia* sp. indet. at D = 22 mm. USNM 438362.

Superfamily **Pinacocerataceae** Mojsisovics 1879
Family **Gymnitidae** Waagen 1895
Subfamily **Japonitinae** Tozer 1971
Genus *Japonites* Mojsisovics 1893

Japonites welteri n. sp.
Plate 1, Figure 11; Plate 6, Figures 4–6; Text-Figure 20

Eophyllites sp. A. Silberling & Wallace 1969, Tabl. 1. Silberling & Nichols 1982, p. 5

Description. Serpenticone japonitid with an almost rounded whorl section on phragmocone and beginning of body chamber. Further development of body chamber shows transition to a platycone shape, with proportionally increasing whorl height and individualization of a short and steep umbilical margin. On phragmocone and beginning of body chamber, ornamentation is reduced to dense, slightly sinuous fine folds that cross the venter. On some variants, strength of folds may even increase when crossing the venter. Transition to mature body chamber is enhanced by gradual appearance of convex and rursiradiate blunt umbilical folds fading towards outer flanks. At D = 66 mm (holotype), H = 20%, W = 22% and U = 50%. Mature suture line subammonitic, with a wide and deeply indented first lateral lobe. First and second lateral saddles of equal height, the former having a particular forked-shaped spatula morphology.

Discussion. At the time this form was first mentioned (Silberling & Wallace 1969), characters of both body chamber and suture line were evidently not known. Its rather featureless phragmocone is actually hardly discernible from that of some *Eophyllites.* Of most probable Anisian age, serpenticone japonitids closely allied to *J. welteri* include *J. ziyunensis* Wang, *J. maduoensis* Wang & Chen, *"J. raphaelis zojae"* Tommasi (sensu He and others 1986) and to a lesser degree *J. meridianus* Welter. *J. asseretoi* Fantini-Sestini, *J. surgiva* Diener, *J. subacutus* Welter, *J. magnus* Wang & He, *J. starensis* n. sp. and *Eogymnites arthaberi* (Diener)[2)] differ from the previous group in having either a depressed and – or subtrigonal whorl section with a narrowly arched venter.

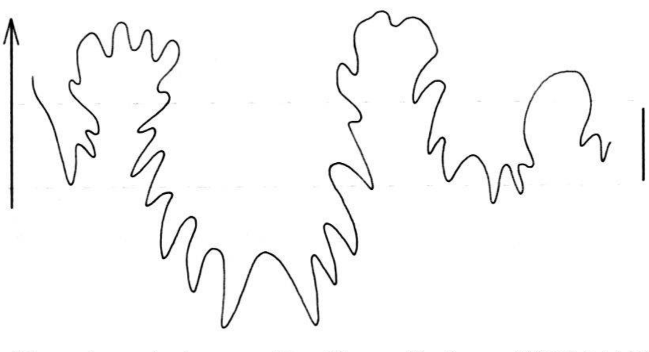

Fig. 20. Suture line (× 6) of *Japonites welteri* n. sp. at D = 25 mm. Plesiotype USNM 444088 (specimen not figured). Loc. HB 184, *Japonites welteri* beds; Coyote Canyon.

[2)] *Eogymnites arthaberi* (Diener) is the only japonitid of alleged Spathian age (Arthaber 1911, see also Spath 1951 and Kummel 1969). The Hallstatt limestones stratigraphy and the complex tectonic setting of the Triassic of Albania (Arthaber 1911, Figs. 1, 2) cast some doubt on the validity of the age assigment of this single specimen. Though not exactly placed in the local sequence, a representative of *Acrochordiceras (carolinae* group of Middle Anisian age) illustrated by Arthaber (1911) makes it probable that *Eogymnites arthaberi* is of Anisian age.

Together with FANTINI-SESTINI (1981), it must be emphasized that *Gymnites raphaelis zojae* was initially described from the Wengener Schichten of Monte Clapsavon by TOMMASI (1889). This confers a Ladinian age to TOMMASI's *Gymnites*. It is also consistent with its occurrence in the Asklepeion Limestone (FRECH & RENZ 1908 [= *Japonites argivus*]; RENZ 1910) where it is found to be associated with other Ladinian ammonoids (confirmed by L. KRYSTYN, oral com., 1988). Subsequent treatment of japonitids from various supposed late Spathian or early Anisian localities as *J. raphaelis zojae* is thus rather unsatisfactory (WELTER 1915; BENDER 1970; HE and others 1986). Timor form 3 of WELTER (1915, Pl. 10, Fig. 1) yet differs from *J. welteri* by its apparently perfectly smooth venter and by lacking the well defined rursiradiate umbilical folds at larger diameter. WELTER's form 1 (Pl. 10, Fig. 3) differs in turn by generalization of umbilical folds to the entire shell and by its subtriangular whorl section. Inclusion of WELTER's form 1 into *J. asseretoi* from Chios Island (BENDER 1967; FANTINI-SESTINI 1981) as suggested by FANTINI-SESTINI is probably justified. *"Japonites raphaelis zojae"* is also recorded from the *"Lenotropites"-Japonites* Zone (*Japonites meridianus* Subzone) of Central Qinghai (HE and others 1986, p. 240, Pl. 9, Figs. 15 to 19). Inner whorls of *J. welteri* resemble those of the Qinghai form but the latter differs by its suture line whose first lateral saddle is not spatula-shaped.

J. ziyunensis and *J. meridianus* are distinguished from *J. welteri* by their apparently more compressed, almost platycone inner whorls. Moreover, *J. meridianus* also differs by its finer ribbing.

J. welteri is named in honor of O. A. WELTER.

Figured specimens. Holotype USNM 438369, paratype USNM 438367, plesiotypes USNM 438368 and 438318.

Occurrence. Loc. HB 92 (11), HB 235 (4), HB 109 (9), Coyote Canyon; HB 181 (8), Bloody Canyon; HB 184 (41), Star Creek Canyon, northern Humboldt Range, Nevada. *Japonites welteri* beds, Lower Anisian.

Japonites cf. *J. surgriva* DIENER

Plate 2, Figure 1

Japonites surgriva DIENER 1895, p. 32, Pl. 7, Fig. 1 [holotype]. NOETLING 1905, Pl. 14, Fig. 2.
[not] *Japonites surgriva* DIENER var., ARTHABER 1911, Pl. 20, Fig. 4.
Japonites cf. *J. surgiva* DIENER, SILBERLING & NICHOLS 1982, p. 39.

Description. A single immature fragmentary specimen gives evidence that *Japonites* occurs in the *Caurus* Zone. It has a relatively high trigonal whorl section with convex flanks that converge towards the very narrowly arched venter. The largest width is at inner flanks. Umbilical margin short and very steep. This specimen is apparently smooth except for the penultimate whorl which bears widely spaced wavy folds on inner flanks. Suture line not known.

Discussion. This specimen is undoubtedly closely allied to *Japonites surgriva* DIENER from the *"Ptychites rugifer* Zone" of Shalshal Cliff (DIENER 1895, 1912; NOETLING 1905). *Japonites* cf. *J. surgriva* is also reported from the Upper Hyatti Zone in the northern Humboldt Range (SILBERLING & NICHOLS 1982). Comparison of the latter with the Caurus Zone specimen does not lead to different specific assignment.

Figured specimens. Plesiotype USNM 438319.

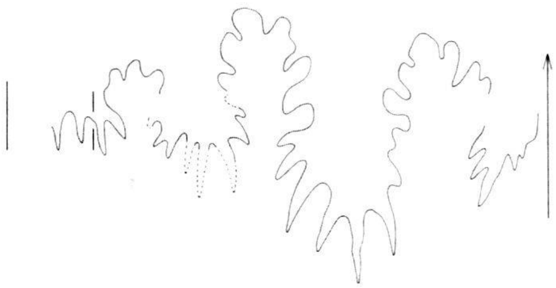

Fig. 21. Suture line (× 3) of *Japonites starensis* n. sp. at D = 25 mm. Holotype USNM 438325.

Occurrence. Loc. HB 180 (1), Bloody Canyon, northern Humboldt Range. *Caurus* Zone, Lower Anisian.

Japonites starensis n. sp.

Plate 2, Figure 7; Text-Figure 21

Description. Relatively involute japonitid with subquadrate to subtrapezoidal whorl section. Both whorl height and width increase rapidly. Venter broadly arched and smooth, umbilical wall high and slightly rounded. Short radial ribs on inner flanks become gradually less closely spaced as diameter increases. At D = 43 mm, H = 37%, W = 40% and U = 35%. The suture line concords with that of japonitids. The broad first lateral lobe has remarkably deep incisions.

Discussion. Japonites starensis differs from other japonitids by its thicker whorls and its short radial ribs.

Figured specimens. Holotype, USNM 438325.

Occurrence. Loc HB 184 (1), Star Creek Canyon, northern Humboldt Range, Nevada. *Japonites welteri* beds, Lower Anisian.

Genus *Caucasites* Shevyrev 1968
Caucasites nicholsi n. sp.

Plate 5, Figures 1–4; Text-Figure 22

Description. Shell shape cadicone, with stairs-like umbilicus. Phragmocones obtained from locality HB 56 display a wide variability, ranging from moderately to strongly depressed variants (H% and U% plotted on Fig. 23). Shell smooth, with only prorsiradiate growth striae or thin, weak folds that cross the venter. Whorl height proportionally increases on outer whorls and body chamber. Venter, at first broadly arched, then gradually changing into a subfastigate outline. The largest known specimen has an estimated diameter of about 9 cm. Although badly crushed, this specimen bears wavy, blunt folds on lower flanks of ultimate whorl. Suture line ammonitic, with relatively short, finely frilled saddles. First lateral saddle typically more slender than second lateral saddle.

Discussion. Caucasites nicholsi compares with *C. inflatus* Shevyrev as originally described from Caucasus. It is however distinguished from *C. inflatus* in having an invariably more finely frilled suture line. The Upper Anisian age assignment of

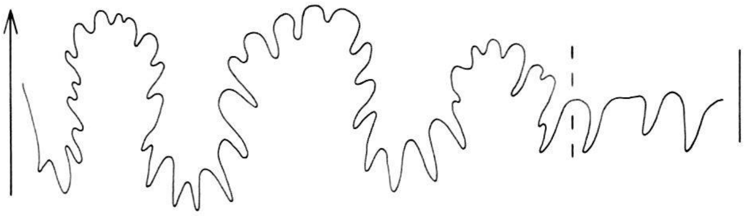

Fig. 22. Suture line (× 6) of *Caucasites nicholsi* n. sp. at D = 21 mm. Plesiotype USNM 438352.

C. inflatus by SHEVYREV (1968) is rather questionable. The faunal list of its "second assemblage" (op. cit., p. 34) reveals obvious mixing of non-contemporaneous ammonoids. These include forms which occur distinctively at different time intervals throughout the Anisian stage. As far as known, presence of *Caucasites* in the Lower Anisian substage as exemplified by the Nevada sequence is the only reliable stratigraphic occurrence available by now.

Species named for K. M. NICHOLS of the U.S. Geological Survey at Denver.

Figured specimens. Holotype USNM 438351, plesiotypes USNM 438352 to 438354.

Occurrence. Loc. HB 56 (36), HB 95 (1), HB 115 (2), HB 59 (5), HB 88 (2), HB 91 (2), Coyote Canyon, northern Humboldt Range. *Mulleri* Zone, Lower Anisian.

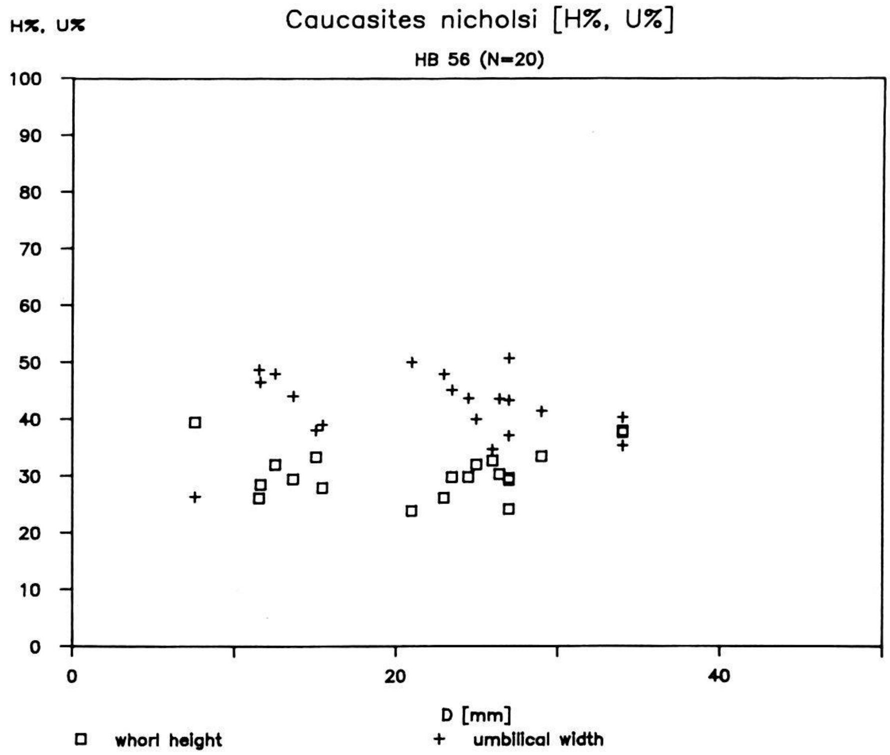

Fig. 23. Scatter diagram of H% (squares) and U% (crosses) against corresponding diameter for 20 specimens of *Caucasites nicholsi* n. sp. from locality HB 56 in *Mulleri* Zone; Coyote Canyon.

Subfamily **Gymnitinae** WAAGEN 1895
Genus *Gymnites* MOJSISOVICS 1882
Gymnites billingsi n. sp.

Plate 6, Figures 1–3; Text-Figure 24

Description. Evolute, extremely compressed, with slightly convex but not flattened flanks. Venter narrow, bluntly angular. Umbilical wall very short and step. Flanks smooth except for weak, irregular, poorly defined folds. At D = 50 mm, H = 35%, W = 14% and U = 40%. Though less complexly subdivided, the suture line conforms with that of other congeneric species. The retracted suspensive lobe has 3 auxiliary lobes external of the umbilical seam.

Discussion. Differs from *G. tregoi* SILBERLING & NICHOLS by its more compressed whorl section and narrower venter. Suture line obtained from newly collected specimens of *G. tregoi* does not significantly differ from that of *G. billingsi.*

Species named for Mr. and Mrs. W. BILLINGS of Unionville, Nev.

Figured specimens. Holotype USNM 438364, paratypes USNM 438365 and 438366.

Occurrence. Loc. HB 56 (7), Coyote Canyon, northern Humboldt Range. *Mulleri* Zone, Lower Anisian.

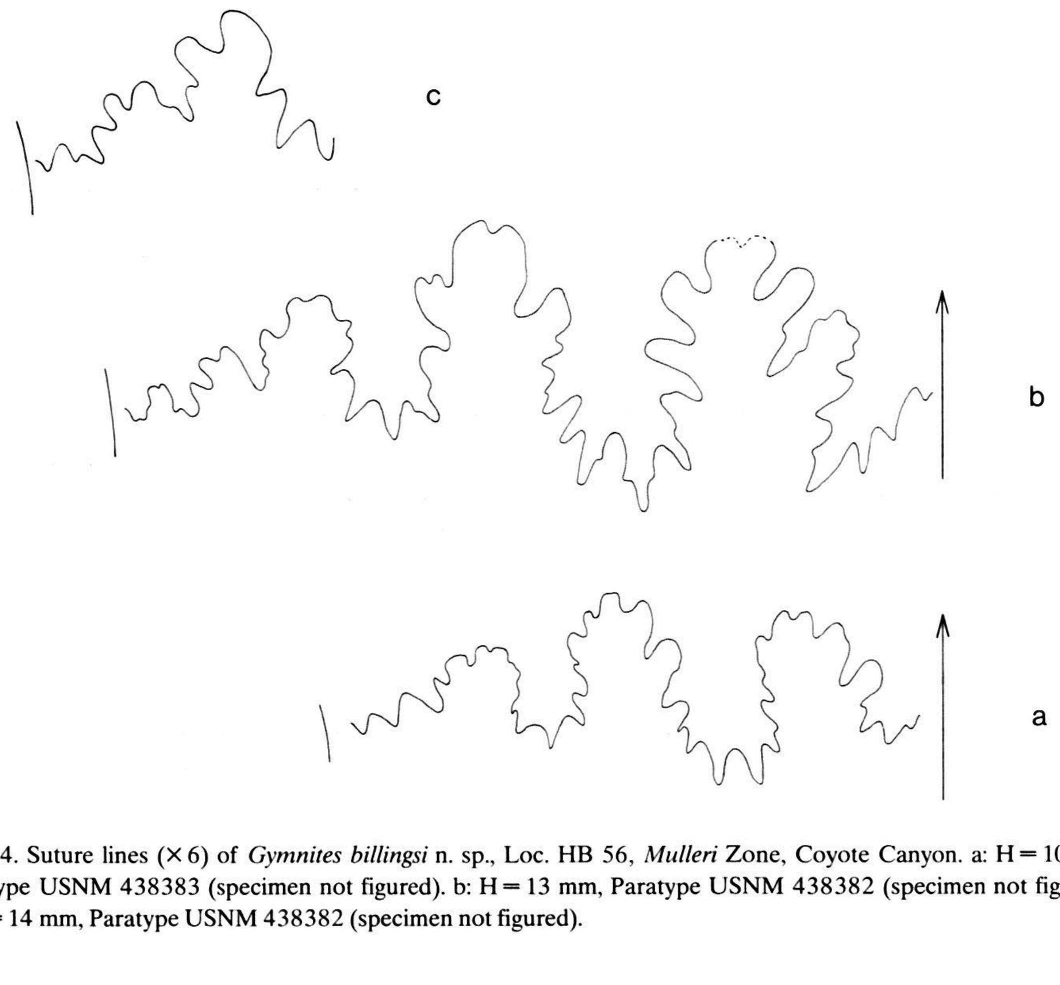

Fig. 24. Suture lines (× 6) of *Gymnites billingsi* n. sp., Loc. HB 56, *Mulleri* Zone, Coyote Canyon. a: H = 10 mm, Paratype USNM 438383 (specimen not figured). b: H = 13 mm, Paratype USNM 438382 (specimen not figured). c: H = 14 mm, Paratype USNM 438382 (specimen not figured).

Order **Phylloceratida**
Superfamily **Ussuritaceae** Hyatt 1900
Family **Paleophyllitidae** Popov 1958
Genus *Leiophyllites* Diener 1915

Leiophyllites sp. indet.

Plate 7, Figures 9–10; Text-Figure 25

Description. Compressed, extremely serpenticone with faint but strongly rursiradiate folds on flattened flanks. Venter smooth, narrowly arched and umbilical margin rounded. At D = 21 mm, H = 24%, W = 20% and U = 55%. Suture line ceratitic.

Discussion. Shell shape and ornamentation suggest some affinities *L. pitamaha* (Diener) but the rather simple suture line precludes any further comparisons.

Figured specimens. USNM 438380 and 438381.

Occurrence. Loc. HB 94 (3), Coyote Canyon, northern Humboldt Range. *Mulleri* Zone, Lower Anisian.

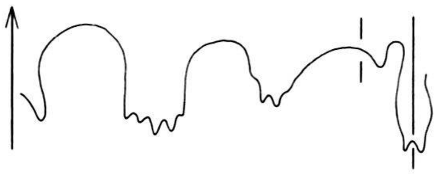

Fig. 25. Suture line (× 6) of *Leiophyllites* sp. indet. at H = 5 mm. USNM 444089 (specimen not figured). Loc. HB 94, *Mulleri* Zone; Coyote Canyon.

Family **Ussuritidae** Hyatt 1900
Genus *Ussurites* Hyatt 1900

Ussurites sp. indet.

Plate 7, Figure 2; Text-Figure 26

Description. Smooth, serpenticone ussuritid with subquadrate whorl section. Venter convex, bordered by gentle ventral shoulders. Because outer shell is not preserved, presence of a possible striation could not be confirmed. Suture line with monophyllic saddles, the second lateral saddle having the diagnostic subdivision of ussuritids on its dorsal side.

Discussion. Generic attribution to *Ussurites* is supported by the diagnostic sutural pattern. At comparable whorl height, subdivision of the second lateral saddle is less pronounced and merely absent on the third lateral saddle of *U.* sp. indet., whereas both saddles are deeply indented among representatives of the younger *U. arthaberi* Welter. *U.* sp. indet. more significantly differs from other congeneric species by its serpenticone and relatively compressed shape. With respect to that, *U.* sp. indet. embodies a combination of a ussuritid sutural pattern with a paleophyllitid shell shape.

Figured specimens. USNM 438373.

Occurrence. Loc. HB 56 (1), Coyote Canyon, northern Humboldt Range. *Mulleri* Zone, Lower Anisian.

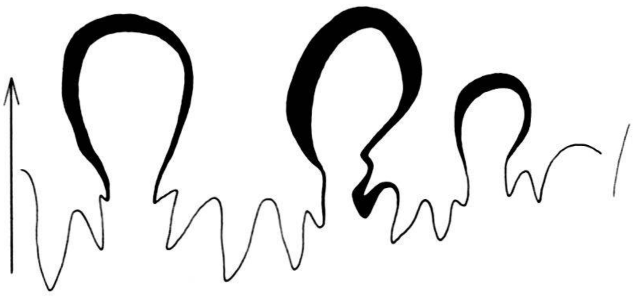

Fig. 26. Suture line (× 6) of *Ussurites* sp. indet. at D = 24 mm. USNM 438373.

Ussurites detwilleri n. sp.

Plate 7, Figure 1

Description. Inner whorls evolute, rounded and ribbed. Further development shows increasing spacing of radial ribs which gradually fade on outer whorls. Whorl section simultaneously changes into an ovoid outline. Umbilical margin is then well individualized and slightly convex flanks gently converge towards the permanently broadly arched venter. Striation visible on what is left of outer test. At D = 37 mm, H = 38%, W = 34% and U = 36%. Suture line not known.

Discussion. Though suture line could not be obtained, shell shape and presence of striae make attribution to *Ussurites* very likely. Ribbed inner whorls are the chief difference when compared with *U. arthaberi* Welter, *U. muskwa* McLearn, *U. hara* Diener and *U. kingi* Diener. This difference equally applies to *U.* sp. indet. which is additionally much more evolute and compressed.

Species named for K. Detwiller of the Bureau of Land Management, Winnemucca, Nev.

Figured specimens. Holotype USNM 438372.

Occurrence. Loc. HB 225 (1), Bloody Canyon, northern Humboldt Range. *Caurus* Zone, Lower Anisian.

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