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NEW SPECIES FROM THE TRIASSIC SCHOOLER CREEK FORMATION*

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THE SCHOOLER CREEK formation includes all the Triassic beds of the foot-hills along Peace river and vicinity, in eastern British Columbia. It consists of light and dark grey to almost black, partly carbonaceous limestones, very fine calcareous sandstones and shales. The exact thickness is not known, but must be more than 2500 and possibly even 3000 feet. At present the following faunal zones can be recognized:

Monotis subcircularis
Juvavites—Drepanites—Halobia
Lima poyana
Lingula
Nathorstites

The *Nathorstites* fauna includes *Cocnothyris petriana* n. sp., *S. silvana* n. sp., *Spiriferina onstae* n. sp., *Daonella nitanae* n. sp., *Hoernesia? woyaniana* n. sp., *Modiola ahsisi* n. sp., *Monotis montini* n. sp., *Silenticeras hatae* McLearn, *Isiculites schooleri* n. sp., *I. schooleri* var. *parvus* n. var., *Lobites pacianus* n. sp., *Nathorstites* cf. *mcconnelli* (Whiteaves); *N.* cf. *mcconnelli* var. *lenticularis* (Whiteaves), *Nitanoceras selwyni* (McLearn), *Sirenites (Meginoceras) megini* (McLearn), *Protrachyceras sikanianum* (McLearn), *P. zauxac* (McLearn) and *Sagenites gethingi* n. sp. All *Nathorstites*-bearing faunas have a northern or circum-arctic distribution and they have been found on Liard river in northeastern British Columbia, in Alaska, the Kotelyny islands, Spitzbergen and Bear islands. The fauna of the Peace River area has little in common with other *Nathorstites* faunas except *Nathorstites*. It is likely of approximately, but not necessarily of exactly, the same age as the other faunas. Their exact correlation with Mediterranean faunas has been attended with difficulty, but a Karnian or early Neo-Triassic age has been usually assigned to them. It seems possible however that the Peace River *Nathor-*

sites fauna is earlier than Karnian and Ladinian or late Meso-Triassic age. At best only a very early Karnian or very early Neo-Triassic age seems possible.

The *Lingula* faunal zone immediately overlies the *Nathorstites* zone. The fauna includes *Lingula*, probably *Lingula selwyni* Whiteaves, and the species of *Cocnothyris* and *Spiriferina* which occur in the *Nathorstites* zone. The age cannot be very much later than that of the *Nathorstites* fauna.

Above this is a zone mostly barren of fossils. Then comes a zone with *Lima poyana* n.sp., *Pinna* sp. and *Pleurophorus* sp.

Yet higher the *Juvavites—Drepanites—Halobia* zone contains *Gryphaca chakii* n. sp., *Halobia* sp., *Mysidioptera* cf. *Fornicata* Bittner, *Oxytoma* cf. *mucronata* (Gabb), *Discotropites* cf. *acutus* (Mosjissovics), *Drepanites rutherfordi* n. sp., *Juvavites bococki* n. sp., *J.* (*Gonionotites*) sp., *Stikinoceras kerri* McLearn and *S. robustum* n. sp. This fauna shows both Karnian and Norian affinities and more than one zone may be included in it.

The fauna of the highest zone contains *Ostrea* sp., *Monotis subcircularis* Gabb and *Pecten* n. sp. It records a widely spread fauna of Norian or Neo-Triassic age.

The faunas of the Schooler Creek formation will be described in forthcoming publications. A preliminary description of a few important species is given below.

Cocnothyris petriana n. sp.

Plate I, figure 1

This is comparatively large, biconvex, longer than wide, very thick species. Near the anterior margin on the dorsal valve is a low fold bordered by shallow furrows and on the ventral valve is a shallow furrow bordered by low folds. The surface is almost smooth and the shell is punctate. Dental plates are well defined in the ventral valve and there is a median septum in the dorsal

valve. The loop is unknown. This is a larger species than "*Terebratula*" *liardensis* Whiteaves. The outline differs from that of *Coenothyris vulgaris* (Schlotheim) and the furrows bordering the dorsal fold are not present in that species. Geol. Surv. collections, holotype, cat. no 9141.

Coenothyris silvana n. sp.

Plate I, figure 3

This is a smaller species than *Coenothyris petriana* n. sp., and it has a higher and more pronounced median fold and deeper furrows in the dorsal valve and deeper median sinus and more pronounced folds in the ventral valve than either *C. petriana* or "*T.*" *liardensis*. It has dental plates and median dorsal septum as in that species. Geol. Surv. collections, holotype, cat. no. 9142.

Spiriferina onestae n. sp.

Plate I, figure 5

This is a biconvex, thick, wide species, much wider than long. The cardinal area of the ventral valve is variable, but is large in all specimens and apsacline to almost catacline. The surface has about 12 to 16 rather angular folds and there is one large costa in the ventral sinus and 2 large costae or small folds in the dorsal fold. There is a well defined median septum and dental plates in the ventral valve. The shell is punctate. This is a smaller, relatively wider and shorter species than *Spiriferina borealis* Whiteaves and the cardinal area of the ventral valve is apsacline to catacline, not anacline. The size is greater and the cardinal area smaller than in *Spiriferina gregaria* Suess. Geol. Survey collections, holotype, cat. no. 9143.

Hoernesia? woyaniana n. sp.

Plate I, figure 10

This is an elongate, somewhat twisted species with a fairly convex left valve. A narrow sulcus and fold above the broadly rounded post-umbonal slope are absent in *Hoernesia socialis* Schlotheim. Geol. Surv. collections, holotype, cat. no. 8768.

Monotis montini n. sp.

Plate I, figure 6

Shell rounded, nearly equilateral, convex with an almost flattened posterior wing. The radial costae are finer and more even than in *Pseudomonotis multiformis* Bittner and the size is larger and the "wing" better defined than in *P. tenuistriata* Bittner. Geol. Survey collections, holotype, cat. no. 8765.

Daonella nitanae n. sp.

Plate I, figure 11

This shell is an elongate, moderately convex species. The paired costae are more curved than those of *Daonella lommeli* Wissman. The ribs are finer and more curved than those of *Daonella dubia* Gabb. Geol. Survey collections, holotype, cat. no. 8773.

Gryphaca chakii n. sp.

Plate I, figure 8

The left valve is very convex, a little higher than long and is ornamented with irregular concentric folds and varices of growth. The size is larger and the sculpture coarser than in *Gryphaca keilkau* Boehm. Geol. Surv. collections, holotype, cat. no. 8770.

Lima poyana n. sp.

Plate I, figure 9

This is a moderately convex species, ornamented with about 5 or 6 large, rounded, radial ribs. It is larger and has fewer ribs than *Mysidiop-tera? dubiosa* Bittner, shows a different outline and fewer ribs than *M. emiliae* Bittner. Geol. Surv. collectons, holotype, cat. no. 8772.

Modiolus ahsisi n. sp.

Plate I, figure 2

This is a convex species with short hingeline and fine, concentric growth lines. It is more convex and has beaks situated somewhat less anteriorly than *Modiolus raibiana* Bittner. Geol. Surv. collections, holotype, cat. no. 8767.

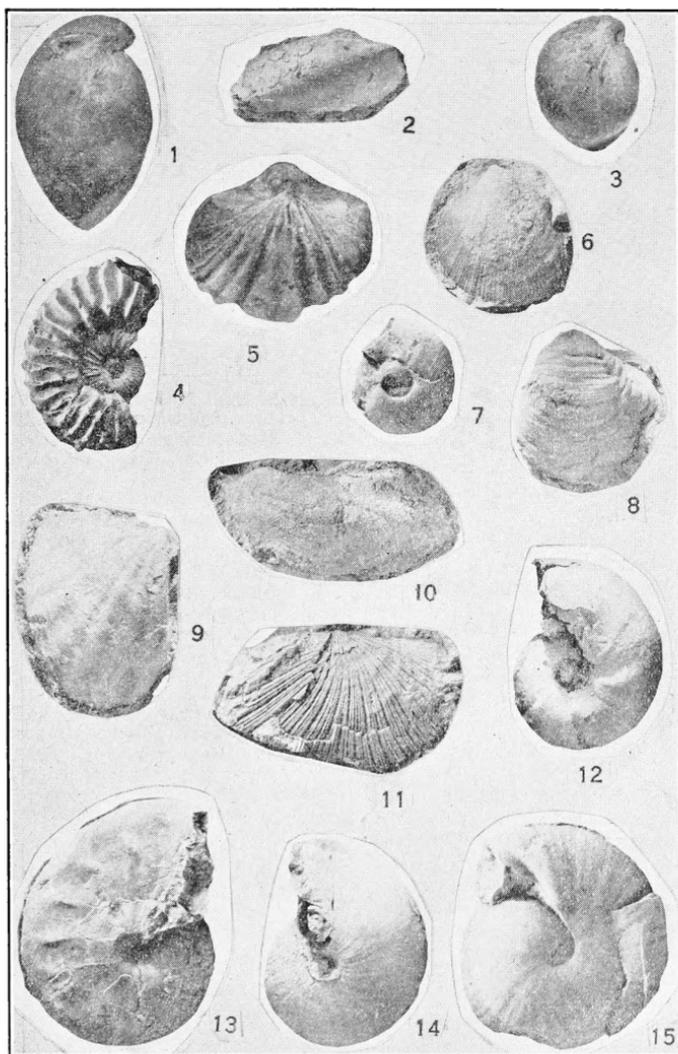
Nitanoceras n. gen.

This genus is created to include the single species *Arcstes? setwyni* McLearn, which is smaller, even more evolute and has a simpler suture line than any of the Spitzbergen species of *Parapopanoceras* Haug. It is also smaller and has a simpler suture line, with fewer sutural elements, than any species of *Megaphyllites* Mojsisovics. In the suture line L1 is long and broad and has five indentations which do not run up very far on the sides of the saddles. L2 is smaller and has three indentations. The first auxiliary lobe has three indentations and the second has two not very well defined indentations. There are at least three additional lobes on the sides.

Lobites pacianus n. sp.

Plate I, figure 15

This species has a more irregular and subdued surface ornament than *Lobites ellipticus* (Hauer) and stouter saddles in the suture line. The earlier whorls are involute, but on the last



half of the ultimate whorl there is whorl contraction and umbilical expansion. The surface of the inner whorls have mostly fine growth lines, crossed by faint transverse striae. The living chamber has irregular, poorly defined costae and irregularly spaced, shallow constrictions or furrows, all bent forward on the sides and straight across the venter. Geol. Survey collections, holotype, cat. no. 8789.

Isculites schooleri var. *parvus* n. var.

Plate I, figure 7

This is merely a small variety of *Isculites schooleri* McLearn. Geol. Surv. collections, holotype, cat. no. 8793.

Juvavites bococki n. sp.

Plate I, figure 14

This is a moderately compressed, involute species. The whorls have converging, convex sides and narrow, abruptly rounded venter. The core is almost smooth, there being merely faint, subdued costae bent forward a little near the venter. It resembles both *J. (Anatomites) konincki* Mojsisovics and *J. (Anatomites) sigismundi* Mojsisovics, but no constrictions are present. Geol. Surv. collections, holotype, cat. no. 8831.

Sagenites gethingi n. sp.

Plate I, figure 12

The whorls are stout, rapidly enlarging, rounded and thicker than high. There are transverse striations or very fine costae of low relief and lines and irregular varices of growth. It is not so compressed as *Sagenites inermis* (Hauer) and has mostly a larger umbilicus. Geol. Surv. collections, holotype, cat. no. 8806.

Drepanites rutherfordi n. sp.

Plate I, figure 13

Compared with *Drepanites hyatti* Mojsisovics the costation on the outer part of the sides is not so strong, the "beading" along the ventral shoulder appears to be finer, the form is more compressed and the lobes of the suture line are relatively shorter and the saddles broader and not so deep. Geol. Survey collections, holotype, cat. no. 8817.

Stikinoceras McLearn

This shows some resemblance to *Mojsisovites* Gemmellaro and both genera should be referred to the same family. *Stikinoceras* includes compressed evolute species with alternating long and short, even, rather stiffly sigmoidal costae, the longer of which is thickened on the umbilical shoulder or forms an incipient bulla there. On the ventral shoulder and borne on the costae are two rows of tubercles, the outer row

being the larger, better defined and somewhat clavus-like in form. There is a very small ridge or thread-like carina on the almost flat, narrow venter. The costation resembles that of *Mojsisovites* but is more even and does not decline and give place to sigmoidal folds on later whorls. The genotype is *Stikinoceras kerri* McLearn.

Stikinoceras robustum n. sp.

Plate I, figure 4

This species has stouter and thicker whorls and, on the outermost whorl, has stouter and tawer costae than *Stikinoceras kerri* McLearn. Geol. Surv. collections, holotype, cat. no. 8839

DESCRIPTION OF PLATE I

Note: All figures are of natural size.

- Figure 1. *Cocnothyris petriana* n. sp. Side view of holotype Geol. Surv. collections, Cat. no. 9141.
- Figure 2. *Modiolus ahsisi* n. sp. Holotype, Geol. Surv. collections, cat. no. 8767.
- Figure 3. *Cocnothyris silvana* n. sp. Side view of holotype. Geol. Surv. collections, cat. no. 9142.
- Figure 4. *Stikinoceras robustum* n. sp. Holotype. Geol. Surv. collections, cat. no. 8839.
- Figure 5. *Spiriferina onestae* n. sp. Dorsal view of holotype. Geol. Surv. collections, cat. no. 9143.
- Figure 6. *Monotis montini* n. sp. Holotype. Geol. Surv. collections, cat. no. 8765.
- Figure 7. *Isculites schooleri* var. *parvus* n. var. Holotype. Geol. Surv. collections, cat. no. 8793.
- Figure 8. *Gryphaea chakii* n. sp. Holotype. Geol. Surv. collections, cat. no. 8770.
- Figure 9. *Lima pozana* n. sp. Holotype. Geol. Surv. collections, cat. no. 8772.
- Figure 10. *Hoernesia? woyaniana* n. sp. Holotype. Geol. Surv. collections, cat. no. 8768.
- Figure 11. *Daonella nitanae* n. sp. Holotype. Geol. Surv. collections, cat. no. 8773.
- Figure 12. *Sagenites gethingi* n. sp. Holotype. Geol. Surv. collections, cat. no. 8806.
- Figure 13. *Drepanites rutherfordi* n. sp. Holotype. Geol. Surv. collections, cat. no. 8817.
- Figure 14. *Juvavites bococki* n. sp. Holotype. Geol. Surv. collections, cat. no. 8831.
- Figure 15. *Lobites pacianus* n. sp. Holotype. Geol. Surv. collections, cat. no. 8789.

Fieldwork in the summer of 1937 emphasizes the Alpine characters of the faunas. The *Halobia* zone includes *Discotropites* cf. *sandlingensis* and other upper Karnian species. No *Tropites* has yet been found. *Placites* and other interesting ammonoids have been collected from the *M. sub-irregularis* zone.