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Notes on Some Canadian Mesozoic Faunas[1]

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One new genus, ten new species and one new variety of Jurassic ammonoids from Skidegate inlet, Queen Charlotte Islands, and the Rocky Mountains of British Columbia and Alberta, and one new genus from the Cretaceous of Alberta are briefly described in the following pages and correlations based on them are given. They will be treated more fully in later publications. Acknowledgment is made to Dr. L. F. Spath for valuable advice, particularly regarding the interpretation of *Fanninoceras* and the correlations. P. S. Warren furnished some important specimens from the Fernie. The writer, of course, takes the responsibility for all interpretations in the following pages. The illustrations are based on drawings by Arthur Miles.

AGE OF THE FERNIE OF KANANASKIS VALLEY, B.C.

In 1926 the writer recorded a probable Middle Inferior Oolite or Lower Middle Jurassic fauna from Kananaskis river and also a higher fauna comparable in age to the Upper Yakoun fauna of Skidegate inlet.[2] The existence of two Fernie faunas on Kananaskis river was not considered proven at the time, however, as the specimens representing the faunas had not then been thoroughly studied. Now after a more thorough examination of the two specimens collected by James McEvoy, one from each fauna, and of a third specimen furnished later by P. S. Warren, the earlier tentative determinations are confirmed and the specimens from Kananaskis valley record the presence of both a Bajocian (Middle Inferior Oolite) or Lower Middle Jurassic fauna and a Callovian or Lower Upper Jurassic fauna. If there is no break in the section, the Fernie of this locality must embrace strata of at least nearly all Middle Jurassic and the beginning of Upper Jurassic time. The upper fauna is represented by *Seymourites mcevoyi* (Mc-

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

[2]McLearn, F. H., Geol. Surv. Can., Bull. 44, p. 91 (1926).

Learn), described in 1928.[3] The genus is known elsewhere in the upper Yakoun fauna of Skidegate inlet. It is a Lower Upper Jurassic or Callovian fauna. The lower fauna is represented by *Teloceras warreni* n. sp. and *T. dowlingi* n. sp. *T. warreni* shows considerable resemblance in form to *Zemistephanus vancouveri* McLearn[4] from the Lower Yakoun of Skidegate inlet, itself doubtfully a true *Zemistephanus*. The fauna is of the same age as the Lower Yakoun of Skidegate inlet and the Fernie fauna on Sheep river, *i.e.*, *humphreysianum* in the broad sense, Bajocian, Middle Inferior Oolite, or Lower Middle Jurassic.

In 1929, P. S. Warren reported the presence of an Upper Jurassic fauna in the Fernie of the vicinity of Minnewanka lake,[5] as well as the approximately Lower Middle Jurassic fauna that had previously been reported from there.[6]

Discoveries of this kind are answering the question raised a few years ago by the writer,[7] when trying to explain the then known, or at least proven, presence of only one, and that a different, Fernie fauna at each locality:—do the Fernie strata represent different and short ranges of time at each locality; or have the strata of all localities approximately the same and a relatively long time range?

The presence of a Lower Middle Jurassic or Bajocian fauna in the Fernie of Mountain Park is recorded by *Stemmatoceras palliseri* n. sp.

The Lower Middle Jurassic seas are known to have spread at least from Sheep river to the Athabaska river, in the Canadian interior. The Lower Upper Jurassic seas are known to have extended at least from about the international border to Kananaskis river. The middle Upper Jurassic Logan sea or seas probably had a greater spread than the earlier seas over the interior trough, particularly in the United States, but in the Canadian interior it is not proven to have been widespread, although it may have been.

Teloceras dowlingi n. sp., 138, 32, 44.5,—. The holotype is entirely septate. The conch is a cadicone of *Teloceras* aspect passing toward serpenticone with highly arched venter; arching of venter begins in cadicone stage; primary ribs in post-cadicone stage short, stout, curved a little, and end in small tubercles. The secondary ribs,

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[3]McLearn, F. H., Geol. Surv. Can., Bull. 49, p. 20, pl. 4, figs. 1, 2 (1928).

[4]McLearn, F. H., National Museum of Canada, Bull. 54, p. 20, pl. 11, figs. 1, 2 (1929).

[5]Warren, P. S., Can. Field-Naturalist, vol. 43, no. 2, p. 26 (1929).

[6]McLearn, F. H., Geol. Surv. Can., Summ. Rept. 1922 B., p. 6 B (1923).

[7]McLearn, F. H., Trans. Roy. Soc. Can., 3rd Ser., vol. 21, Sec. IV, p. 70 (1927).

nearly five to each primary, curve forward a little on the venter. Tubercle position with respect to suture line differs from that in species of *Zemistephanus*. National Museum of Canada; holotype, cat. no. 9050.

Teloceras warreni n. sp. Pl. 1, fig. 4; 152, 32, 51.5, 45.5. In cadicone stage umbilical wall is even steeper and more upright than in *T. dowlingi*. This steep wall is retained even long after umbilical expansion. Rounding of sides later than in *T. dowlingi*. In later part of cadicone stage shows some resemblance in form, well arched venter, etc., to *Zemistephanus vancouveri* McLearn. University of Alberta collections.

Stemmatoceras palliseri n. sp. 131, 30.5, 40.8, 47. Holotype and only specimen is entirely septate; whorls thicker than high. Short stout primary ribs end in small tubercles. Secondary ribs are smaller and more numerous than the primaries, are inclined forward on the sides and straight across the venter. University of Alberta collections.

Age of the Maude Formation

The Maude formation of Skidegate inlet, Q.C.I., was dated Jurassic and probably Lower Jurassic by MacKenzie in 1916[8] with the advice of T. W. Stanton. The formation is certainly of Lower Jurassic age and the writer has endeavoured to determine what part of the Lower Jurassic it can be assigned to. In 1927, the higher fauna in the section west of Alliford bay, which may be called the *Dactylioceras kanense* fauna or faunule, was provisionally dated early Upper Liassic of Lower Jurassic time.[9] Recent studies show that this fauna includes the following ammonoid species: *D. kanense* n. sp., *Harpoceras maurelli* n. sp., *H. allifordense* n. sp., and *H. propinquum* (Whiteaves). It is difficult to give this fauna a very restricted dating, but it is in a general way Toarcian of Upper Liassic time. The fauna which occurs at a lower horizon than the *Dactylioceras kanense* fauna in the section west of Alliford bay has not yet been studied in detail. The *Fanninoceras fannini* fauna or faunule on the south side of Maude island contains *F. fannini* n. sp., *F. carlottense* n. sp., *F. kunae* n. sp., *F. kunae* var. *latum* n. var., *F. lowrii* n. sp., *Pecten carlottensis* (Whiteaves) and most of what Whiteaves described from the "lower sandstones." This, too, is a Toarcian or Upper Liassic fauna and no more detailed dating can be offered. Unless the lower fauna in the section west of Alliford bay turns out to be a Middle or Lower Liassic fauna,

[8]MacKenzie, J. D., Geol. Surv. Can., Mem. 88, p. 46 (1916).

[9]McLearn, F. H., Trans. Roy. Soc. Can., 3rd ser., vol. 21, sec. IV, p. 63 (1927).

which it probably is not, all of the Maude is Toarcian or Upper Liassic.

Dactylioceras kanense n. sp. Pl. 1, fig. 2; 27, 29,—, 49.8; 22.3, 30, 23, 49.8. A compressed serpenticonic *Dactylioceras*, in the broad sense, with narrowed, yet rounded, ventral area. Mature ribbing erectly and thinly laminate, particularly on venter, closely spaced, mostly entire, most of short ventral ribs interculated and all ribs arcuate on venter. An early stage of irregular tuberculation. Suture line very simple, EL much greater than L1. Differs from species referred by Buckman to *Microdactylites* S. Buckman, in more laminate ribs and narrowed, not broadly rounded, venter. National Museum of Canada; holotype, cat. no. 9051.

Harpoceras maurelli n. sp. Pl. 1, fig. 5; 70, 42, 27.1, 27.5. A septicarinate platycone having a narrow, convex, sloping, inner margin with its edge well rounded off. An early brief stage of pseudo-primary ribbing is succeeded by a stage of even, single costate, falciform ribbing, well projected peripherally. Suture line quite deeply cut. L1 much longer than EL. ES wide and divided by a long accessory lobe, in mature stage as long as EL. Original specimen large. All of living chamber gone. National Museum of Canada; holotype, cat. no. 9052.

Harpoceras allifordense n. sp. Pl. 2, fig. 1; 73.6, 40.8, 19.5, 31.9. More compressed than *H. maurelli* n. sp. and shows an early decline in strength of ornament. Septate keel, early brief pseudo-primary rib stage, strong peripheral projection of ribbing and long accessory lobe in ES as in *H. maurelli*. Nat. Mus. Canada; holotype, cat. no. 9053.

Harpoceras propinquum (Whiteaves), Geol. Surv. Can., Mes. Foss., vol. 1, p. 247, pl. 33, figs. 2, 2*a* only (1884). This specimen is chosen as the lectotype of this species. The specimens of figures 2b, 2c are of different genera and species.

Fanninoceras n. gen. A degenerate Harpoceratid. Includes, typically, involute oxycones with overhanging angularly bordered inner margin, and with costate ribbing, declining in some species. Ribs flexuous on sides and variably bent forward on approaching venter. ES divided into two shallow branches; a small accessory saddle on its outer side. Genotype *Fanninoceras fannini* n. sp.

Fanninoceras fannini n. sp. Pl. 1, fig. 3; 38.5, 54.5, 18.9, 13.5. Oxyconic, fairly involute, ornament declining early. National Museum of Canada; holotype, cat. no. 9054.

F. carlottense n. sp. (*Sphenodiscus requienianus* ? Whiteaves, Geol. Surv. Can., Mes. Fossils, Vol. 1, pt. 3, p. 248, pl. 22, figs. 4, 4*a*). 66.5,

59.6, 18.5, 5.3. Differs chiefly from *F. fannini* n. sp. in much greater involution. National Museum of Canada; holotype, cat. no. 4878.

F. kunae n. sp. Pl. 2, fig. 4; 25.5, 51, 20.8, 18.8. Smaller than any of above species of *Fanninoceras*. Ribs of stronger relief at same diameter and bent more strongly forward at venter. National Museum of Canada; holotype, cat. no. 4876c.

F. kunae var. *latum* n. var. Pl. 2, fig. 3; 24.5, 42.8, 21.2, 25.3. The ribs are coarser than in the species and the umbilicus is greater. Nat. Mus. Can.; holotype, cat. no. 9058.

F. lowrii n. sp. Pl. 1, fig. 6; 21.4, 54, 23, 14.5. Differs from preceding species in being angulate ventered and platyconic. National Museum of Canada; holotype, cat. no. 9055.

Stephanoceras caamoni n. sp. Pl. 2, fig. 2; 94.5, 32.8, 38.6, 42.8; 114, — , — , 45.8. Differs from *Stephanoceras skidegatensis* (Whiteaves) in earlier attainment of serpenticone stage, in earlier passing of whorl suture outside line of lateral tubercles and earlier rounding and thinning of whorls. Therefore has more slender whorls. National Museum Canada; holotype, cat. no. 9056.

Stephanoceras yakounense n. sp. Pl. 1, fig. 1; 152, 30.5, 38, 47. Maximum diameter 171.5. Differs from *S. skidegatensis* (Whiteaves) in more secondary ribs per each primary on earlier whorls and more closely spaced and smaller secondary ribs on ultimate whorl. Differs from *S. caamoni* n. sp. in greater size and in postponement to later growth of the thinning and rounding of whorls and of the passing to serpenticone. Dr. Spath, who has examined this specimen, notes its resemblance to *Stephanoceras brodioei* (Sowerby), but also notes that it is more evolute. National Museum of Canada; holotype, cat. no. 9057.

Age of Peace River Sandstone

In 1893, R. G. McConnell[10] collected a fauna in formations, named by him the Peace River sandstone and Loon River shale, on the lower part of Peace river. He included these formations in the Colorado group of the Upper Cretaceous. Whiteaves described several ammonoids from this fauna, and dated it about Coloradoan of Upper Cretaceous time[11].

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[10]McConnell, R. G., Geol. Surv. Can., Ann. Rep., vol. V, pt. 1, pp. 55D, 56D (1893).

[11]Whiteaves, J. F., Trans. Roy. Soc. Can., vol. 10, sec. IV, pp. 113-119, pls. 8-11 (1893).

Later the threefold division of the Peace River sandstone has, been recognized, the fossils have been found to occur at two horizons, lists of species for each horizon have been given and a tentative late Lower Cretaceous dating has been advanced.[12] Below the new genus *Gastroplites* is proposed for the species of "Hoplites" and the late Lower Cretaceous dating is confirmed and more closely defined.

The Lower Cretaceous of eastern Peace river is summarized in the following table:

System		Formation		Fauna
Cretaceous	Lower Cretaceous	Upper Sandstone	Peace	*Gastroplites canadensis*
		Middle Shale	River	
		Lower Sandstone	Sandstone	
		Loon River Shale		*Beaudanticeras affine*

The St. John shale overlies the Peace River sandstone and Palaeozoic limestones, etc., underlie the Loon River shale.

The *Gastroplites canadensis* (Whiteaves) fauna includes that species, other species of *Gastroplites*, species of pelecypods and starfishes. It is of Albian, probably Lower Albian and late Lower Cretaceous date. The *Beaudanticeras affine* (Whiteaves) fauna includes that species, other species of *Beaudanticeras* and pelecypods. The fauna of the Clearwater shale of Athabaska river is similar. It is of about early Albian or late Aptian date. Spath notes[13] that large *Beaudanticeras* like *B. affine* is only known from the Lower Albian and Upper Aptian. The succeeding St. John shale in the northern part of eastern Peace River area, therefore, is of Albian age in its lower part at least. The St. John may be partly also of Cenomanian age.

It is proposed at a later time to compare the eastern and western sections. The basis for that comparison is the probable presence of *Gastroplites* in the St. John shale just over the Gates member in the Peace River canyon. It might be inferred from this that the sands of the Peace River and Grand Rapids formations did not come from an

[12]McLearn, F. H., Geol. Sur. Can., Summ. Rept. 1917C, pp. 15C-16C (1918).
[13]Personal communication.

exactly western direction, *i.e.* not via the upper or western Peace river area.

Gastroplites n. gen. The genotype is *Hoplites canadensis* Whiteaves, Trans. Roy. Soc. Can., Sec. IV, 1892, p. 118, Pl. 11, figs. 3, 3a. Compressed shells with flattened venters and ribs extending across the venter. Suture line reduced. One species has slightly angulate venter and almost pseudo-ceratitic suture line.

EXPLANATION OF PLATES

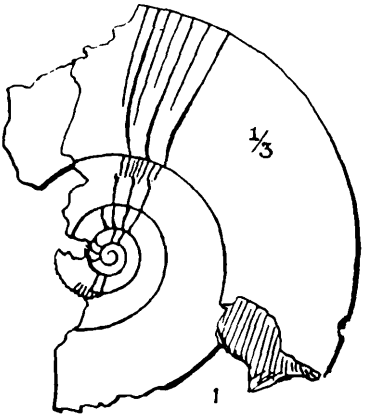
PLATE 1

Fig. 1. *Stephanoceras yakounense* n. sp. Holotype. Nat. Mus. Can., cat. no. 9057
Fig. 2. *Dactylioceras kanense* n. sp. Holotype. Nat. Mus. Can., cat. no. 9051.
Fig. 3. *Fanninoceras fannini* n. sp. Holotype. Nat. Mus. Can., cat. no. 9054.
Fig. 4. *Teloceras warreni* n. sp. Holotype. University of Alberta collections.
Fig. 5. *Harpoceras maurelli* n. sp. Holotype. Nat. Mus. Can., cat. no. 9052.
Fig. 6. *Fanninoceras lowrii* n. sp. Holotype. Nat. Mus. Can., cat. no. 9055.

PLATE II

Fig. 1. *Harpoceras allifordense* n. sp. Holotype. Nat. Mus. Can., cat. no. 9053.
Fig. 2. *Stephanoceras caamoni* n. sp. Holotype. Nat. Mus. Can., cat. no. 9056.
Fig. 3. *Fanninoceras kunae* var. *latum* n. var. Holotype. Nat. Mus. Can., cat. no. 9058.
Fig. 4. *Fanninoceras kunae* n. sp. Holotype. Nat. Mus. Can., cat no. 4876c.

PLATE I



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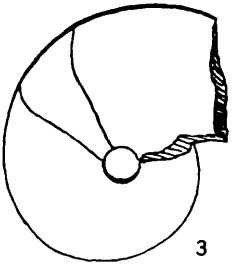

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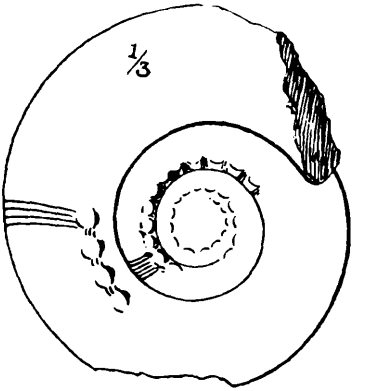

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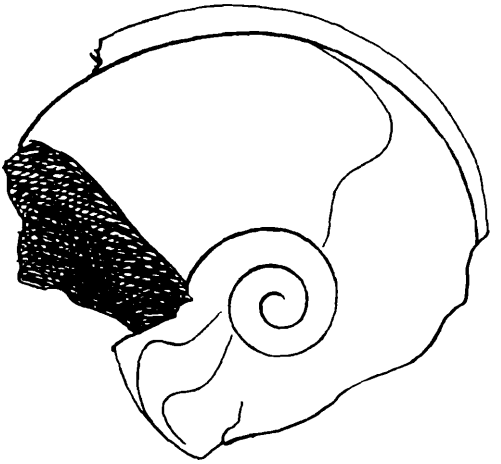

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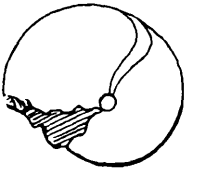

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PLATE II