Madoc district but the principal mass, that on the Henderson and Connolly properties, has roughly the form of a huge east-west-trending spoon lying with its upper or concave side to the north. It is 1100 feet long in a straight line and 1300 feet long measured along its crenelations. It ranges from 5 to 65 feet wide and has been followed to a depth of 300 to 400 feet. The rock in which the talc occurs is dolomite but adjoining the deposit and crossing it in places is a zone (or dyke) of madocite, a rock consisting chiefly of brown tourmaline. About 1000 feet to the south of the deposit there is an extensive mass of granite which has thrust its way into the dolomite. It is probable, since talc is a magnesian silicate and dolomite contains magnesia, that at the time the granite mass was intruded, silica from the granite ascended along a fracture now occupied by the madocite and by a chemical reaction with the magnesia of the dolomite formed talc.

The talc is a soft white glistening flaky material that can be scratched with the finger nail. For use as talcum powder it is ground to a fine flour-like powder that will pass through a 200-mesh screen, that is, to a size that will permit over 177,000 of the ground particles of the talc to occupy an area of one square inch without overlapping. There are two mills for grinding the talc at Madoc, one that of the George H. Gillespie Company, which owns the Henderson mine (Figure I), at the Canadian National Railway station in Madoc village, and the other that of the Canada Talc Company Limited on the Connolly property. The total value of the talc, so far produced from this deposit, is about three and one quarter million dollars. The talc mines lie on the southeast outskirts of Madoc village and only half a mile south of the new Ottawa-Sarnia highway.

NEW SPECIES OF MOLLUSCA FROM THE ST. MARY RIVER FORMATION OF ALBERTA[1]

By LORIS S. RUSSELL

THE St. Mary River formation is developed in southwestern Alberta and adjacent Montana. It consists of alternating sandstones and shales, mostly of fresh-water deposition, and is Late Cretaceous in age. The remains of non-marine mollusks are widely distributed in the formation, and make up a characteristic fauna, the discussion of which is reserved for a forthcoming paper. The present contribution describes several new species in the collection of the Geological Survey of Canada. It is hoped that it will be possible, in a future systematic revision, to treat the taxonomy of these species more fully.

CLASS PELECYPODA

FAMILY SPHÆRIIDÆ

Sphærium mclearni, sp. nov.

Fig. 1

Type.—Geological Survey of Canada, No. 6791; impression of the interior of right ? valve, from St. Mary River beds on north side of Oldman ("Northfork") River, in section 11 or 12, township 10, range 2, west of 5th meridian; F. H. McLearn, 1914.

Description.—Shell of medium size for the genus, broadly ovoid in outline, approximately equilateral, rather convex. Beak situated at midlength, rather prominent. Dorsal margin nearly straight, subangular at each extremity; anterior and posterior margins truncated, a little obliquely; ventral margin broadly convex, most prominent behind midlength, and rounding upward at either extremity. Lateral teeth two in number in front and behind, delicate, compressed; cardinal teeth unknown. Surface apparently with fine lines of growth. Length of holotype, 8.6 mm.; height, 7.7 mm.

Remarks.—This species apparently is a true *Sphærium*. The prominent beak, abbreviated length, and rather tumid form of shell will serve to distinguish *S. mclearni* from other equilateral species with which it might be confused.

Sphærium livingstonensis, sp. nov.

Fig. 2

Type.—G.S.C. No. 6792; a right valve from St. Mary River beds on Oldman River, in section 11 or 12, township 10, range 2, west of 5th meridian, near Livingstone post office, Alberta; F. H. McLearn, 1914.

Description.—Shell moderately large, thin, very convex, elongate and inequilateral. Beak moderately prominent, situated at about one-quarter of shell-length from anterior extremity. Anterior

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

dorsal margin sloping; anterior margin subtruncate or broadly rounded; ventral margin nearly straight in front, broadly rounded behind, most prominent well behind midlength; posterior margin well rounded; posterior dorsal margin straight. Dentition unknown. Surface marked with irregular, concentric growth lines. Length of holotype, 16.3 mm.; height, 9.2 mm.; thickness of complete shell, about 9.4 mm.

Remarks.—This species is well characterized by its elongate and inequilateral shape of shell, as well as by the strong convexity, which is not the result of crushing. Probably the species is not a true *Sphærium*, but may be referred to that genus tentatively.

Pisidium squamula, sp. nov.

Fig. 3

Type.—G.S.C. No. 6793; internal impression of left ? valve, from St. Mary River beds on north side of Oldman River, in section 11 or 12, township 10, range 2, west of 5th meridian; F. H. McLearn, 1914.

Description.—Shell small, suborbicular, inequilateral, very compressed. Beak not prominent, placed behind midlength. Dorsal margin short, sloping from beak; ventral margin most prominent in advance of midlength. Lateral teeth present, the posterior one a little more prominent; cardinal teeth obscure. Length of holotype, 4.3 mm.; height, 3.8 mm.

Remarks.—The extreme flatness of shell seen in this species is not characteristic of *Pisidium*, but the small size and peculiar outline are more suggestive of that genus than of any other of the Sphæriidæ.

CLASS GASTROPODA

FAMILY MELANIIDÆ

Goniobasis sanctamariensis, sp. nov.

Fig. 4

Goniobasis nebrascensis, Whiteaves, Geol. Surv. Canada, Contrib. Can. Pal., vol. 1, p. 21, pl. 3, figs. 4, 4a, 1885.

Type—The holotype is G.S.C. No. 6789, from the south bank of Oldman River, in the southeast quarter, section 3, township 10, range 24, west of 4th meridian. The paratype, figured by Whiteaves, is G.S.C. No. 5545, from St. Mary River in township 1, range 25, west of 4th meridian.

Description.—Shell of medium size, moderately elongate. Volutions five to six, well rounded rather prominent; suture impressed. Aperture ovoid, rounded in front, angulate behind. Surface marked by numerous fine, sinuous lines of growth, crossed by a great many extremely fine revolving striæ. Length of holotype, as preserved, 19.9 mm.; width, 10.0 mm.

Remarks.—This species is widespread in the St. Mary River formation of southwestern Alberta. It is sometimes associated with *G. whiteavesi*,[2] which I now regard as distinct from *G. tenuicarinata*. It is sometimes difficult to decide whether the protruding whorls of specimens are rounded enough for *G. sanctamariensis*, or truly angulate, as in *G. whiteavesi*.

Near the locality of the above-described Sphæriidæ there are present imperfect shells, probably of *G. sanctamariensis*. With these occur numerous opercula of the *Campeloma* type. This throws some doubt on the generic indentification here adopted; indeed, I have thought for some time that many of our Cretaceous and Tertiary species referred to *Goniobasis* may be slender viviparids. However, in the absence of definite evidence in support of this view, it is not advanced at this time.

[2] Russell, Roy. Soc. Canada, Trans., ser. 3, vol. 23, sec. 4, p. 83, pl. 1, figs. 7, 8, 1929.

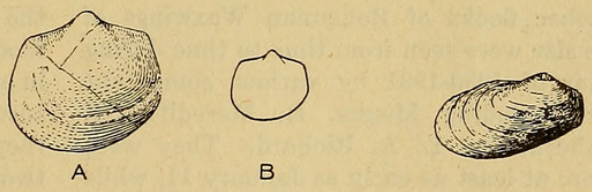

FIG. 1 FIG. 2

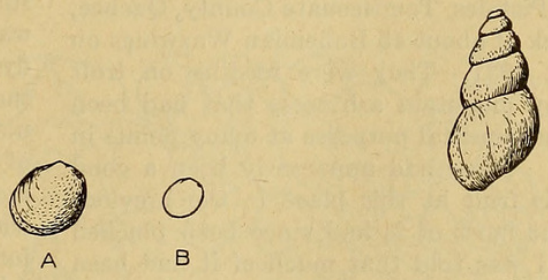

FIG. 3 FIG. 4 L. S Russell

FIG. 1.—*Sphærium mclearni*, sp. nov., holotype. A, lateral view, x 2; B, outline, x 1.

FIG. 2.—*Sphærium livingstonensis*, sp. nov., lateral view of holotype, x 1.

FIG. 3.—*Pisidium squamula*, sp. nov., holotype. A, lateral view, x 2; B, outline, x 1.

FIG. 4.—*Goniobasis sanctamariensis*, sp. nov., dorsal view of holotype, x 1.