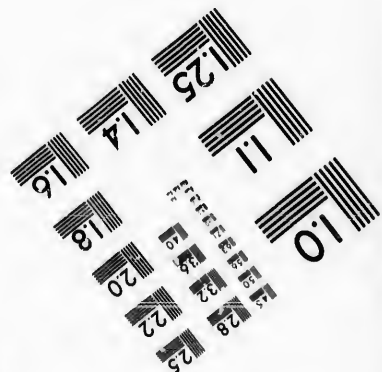
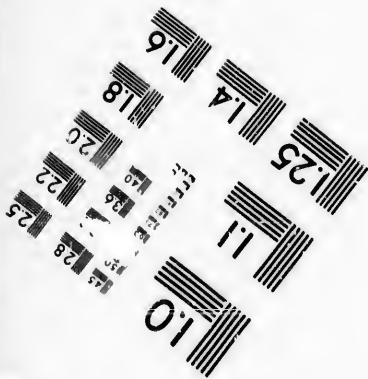
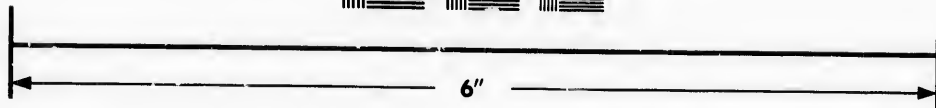
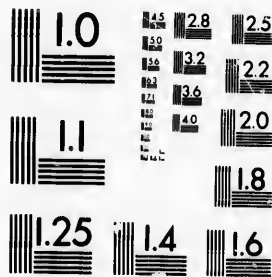


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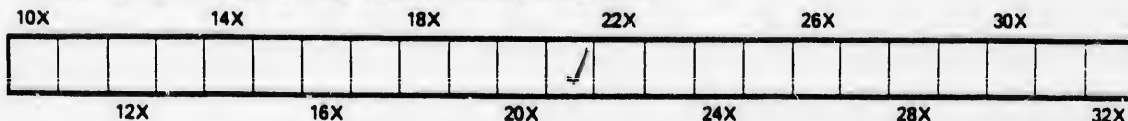
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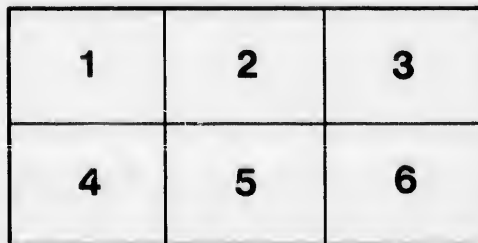
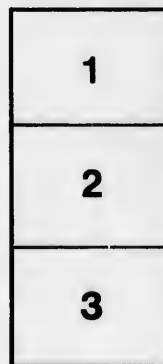
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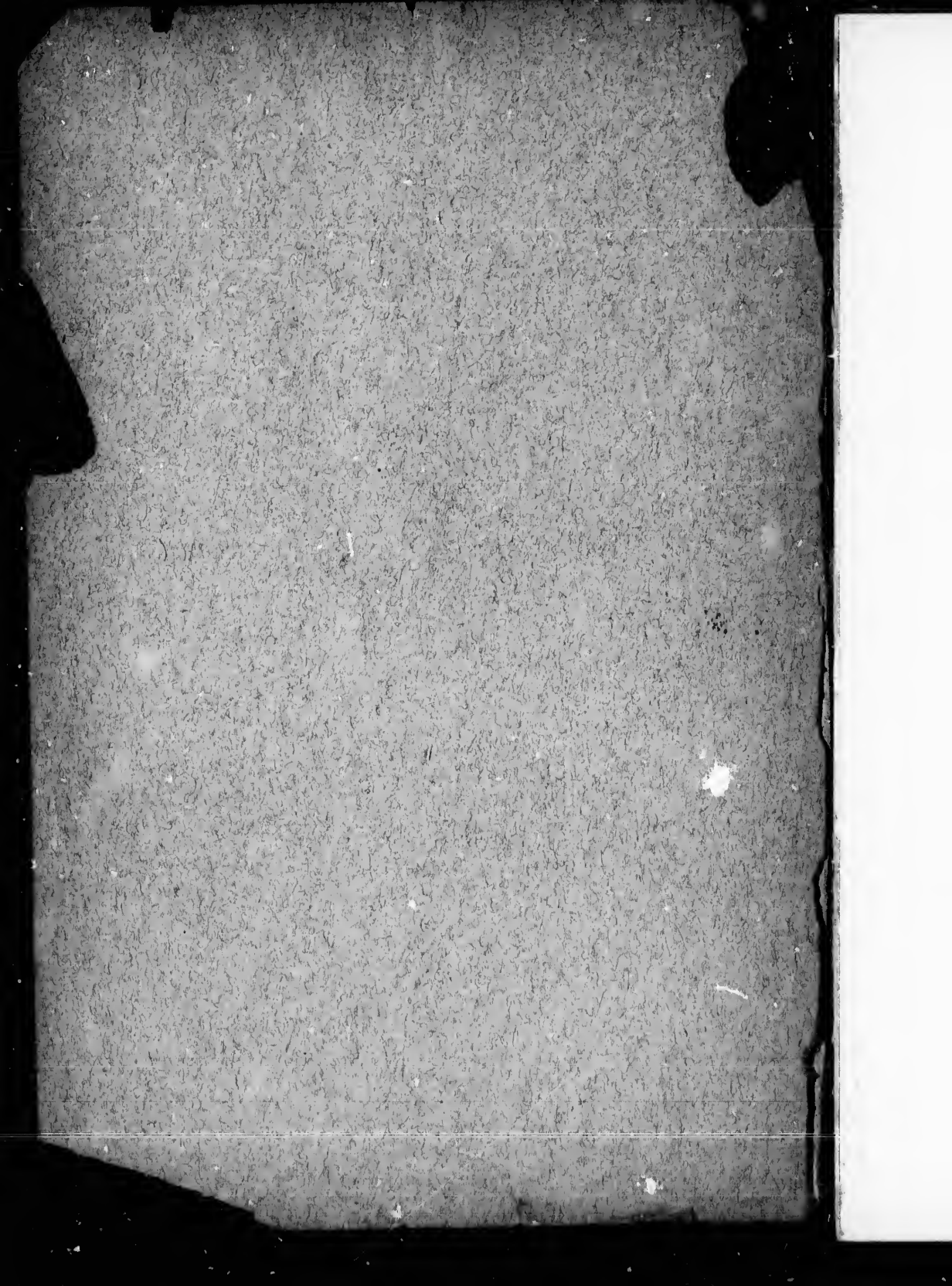
NOTES  
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OF BRITISH COLUMBIA,

With descriptions of two species that appear to be new.

By J. F. WHITEAVES.

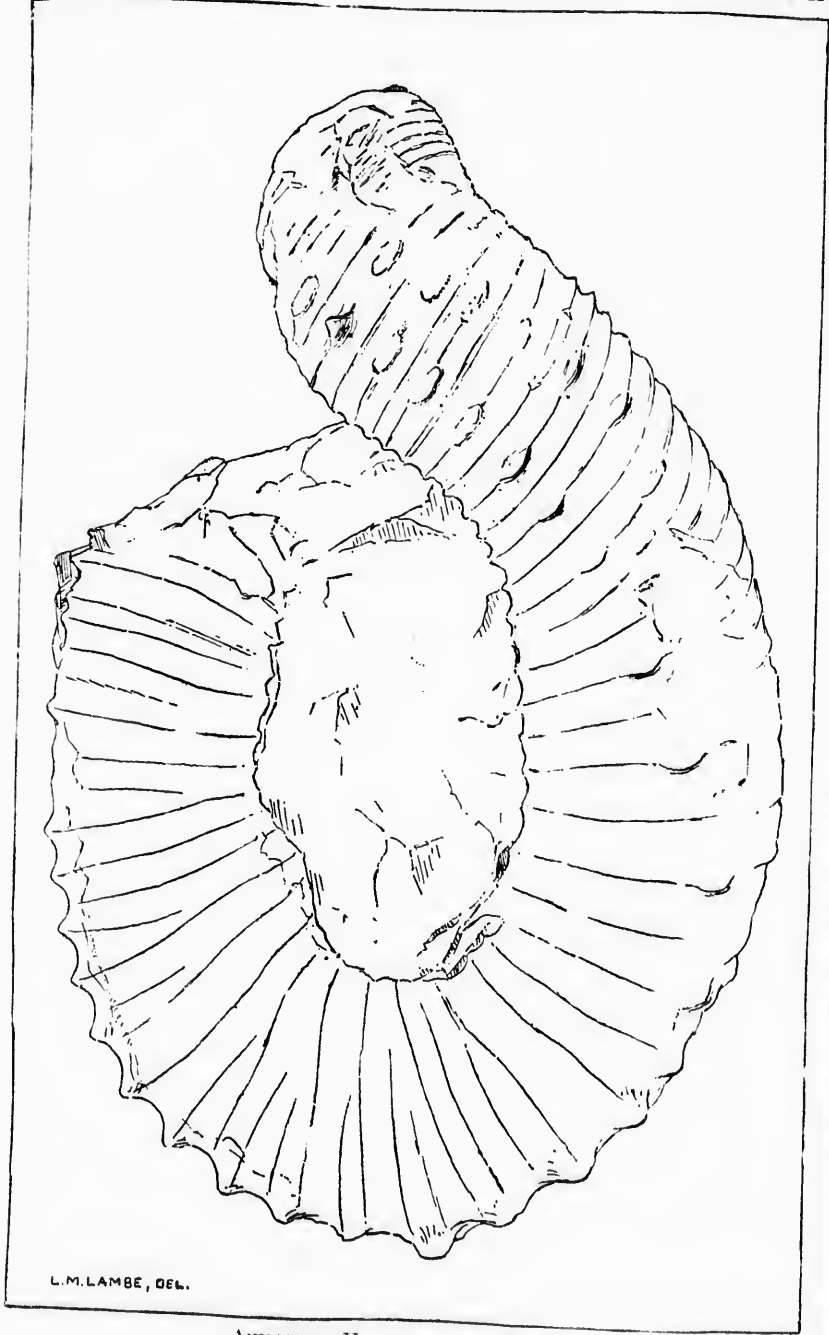
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ANISOCERAS VANCOUVERENSE (Gabb).

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NOTES ON SOME FOSSILS FROM THE CRETACEOUS ROCKS OF  
BRITISH COLUMBIA, WITH DESCRIPTIONS OF TWO SPECIES  
THAT APPEAR TO BE NEW.<sup>1</sup>

By J. F. WHITEAVES.

ANISOCERAS VANCOUVERENSE.

*Hamites Vancouverensis*, Gabb. 1864. Geol. Surv. California, Paleont., vol. I., p. 70, pl. 13, fig. 18.

*Heteroceras Cooperi*, Meek. 1876. U. S. Geol. and Geog. Surv. Terr., vol. II, No. 4, p. 367, pl. 3, figs. 7 and 7a. Perhaps also "? = *Ammonites Cooperi*," Gabb. 1864, Geol. Surv. California, Paleont., vol. I., p. 69, pl. 14, figs. 23 and 23a.

The original description of *Hamites Vancouverensis* is as follows: "Shell large, section elliptical, longest diameter from dorsal to ventral side. Inner width of the curve less than the diameter of the smaller arm. Surface marked by numerous sharp ribs crossing the shell, inclined obliquely forwards; well marked but diminished in size on the ventral side; largest laterally; each rib carrying a small flattened tubercle on the latero-dorsal angle; some ribs in the curve, on the ventral side, exhibit a tendency to tuberculation, but the shell being broken off at that point, their presence cannot be satisfactorily determined. Interspaces between the ribs broadly concave. Septum unknown. Figure, one-half natural size. Locality, Vancouver Island, associated with *Ammonites Necherryanus* and another Ammonite, species undetermined, and a Baculite, figured on pl. 17, figs. 28 and 28a, and pl. 14, fig. 29. Closely allied, in form and ornamentation, to *H. Fremontii*, Marcou, Geol. N. America, p. 36, pl. 1, fig. 3. It differs in the ribs continuing completely across the ventral face, and in each rib carrying a node, instead of

<sup>1</sup> Communicated by permission of the Director of the Geological Survey of Canada.

every third rib, as in Marcou's species." The specimen figured by Mr. Gabb, it may be added, has a little more than four inches of the prolonged portion of the shell preserved, and a very small piece of the reflected anterior portion.

Until quite recently, the writer had never seen a specimen of this species. In the fall of 1883, Mr. Walter Harvey, of Conox, V.I., made a remarkable collection of fossils (which has since been acquired for the provincial museum at Victoria) from the Cretaceous rocks at Denman and Hornby islands, in the Strait of Georgia. This collection was kindly loaned to the writer for examination and study, by Mr. John Fannin, the Curator of the museum at Victoria, in the spring of 1894. Besides other specimens of much scientific interest, which have been or which will be reported upon elsewhere, it contains a fine example of *Hamites Vancouverensis* or, as it should now be called, *Anisoceras Vancouverense*, from Hornby Island. The still more perfect specimen of that species represented in outline, of one-fifth less than the natural size, on the plate which accompanies this paper, was collected by Mr. Harvey at Hornby Island this year (1895) and kindly forwarded to the writer for examination.

The specimen belonging to the Museum at Victoria is a well preserved cast of the interior of nearly the whole of the prolonged and reflected portions of the shell, with small pieces of the test remaining. Its maximum length is a little more than five inches and its marginal outline is regularly but rather broadly elliptical, as the shell is curved obliquely outward before becoming straight and prolonged. The distance between the prolonged and reflected portions is much less than the dorso-ventral diameter of the reflected portion. The surface is strongly ribbed, and many of the ribs bear a large conical tubercle on each side of the periphery, but there is much irregularity in the disposition of the ribs and tubercles.



On the sides of the shell the ribs are usually simple and disposed with comparative regularity, but they occasionally bifurcate, or a short rib is intercalated between two longer ones, and two ribs frequently coalesce on both sides, at one of the tubercles on the outer margin of the periphery. In some places a single continuous rib devoid of tubercles alternates with a single tuberculated rib or with two ribs that bear a tubercle between them on each side of the periphery, but the pairs of tubercles are placed at varying distances apart longitudinally, and not rarely a little to one side of a rib rather than immediately upon it. The sutural line is nowhere visible.

The specimen figured, which is slightly distorted, is nearly eight inches in its maximum length. Although imperfect posteriorly, enough of the earlier portion of the shell is preserved to show that it is narrowly elongated, sinuous, spirally twisted and curved obliquely outward before becoming straight and prolonged, and that it does not consist of a straight shelly tube bent twice or more upon itself, as in *Hamites* proper. The spiral twist posteriorly is especially marked by the lateral position of the two rows of tubercles which ultimately border the periphery. The ribs, which sometimes trifurcate, are much narrower than the broad concave grooves between them, and at least one of the tubercles, in the earlier portion of the shell, is prominent and acutely conical, thus giving the impression that the whole of the tubercles upon the ribs of both specimens may be the bases of spines. This specimen has convinced the writer that *Hamites Vancouverensis* is a true *Anisoceras*, allied to *A. armatum*, Sowerby, but devoid of lateral tubercles, also that the fragment from Comox described and figured by Meek as *Heteroceras Cooperi*, is probably a small piece of the abruptly bent part of *Anisoceras Vancouverense*. A similar fragment, now in the writer's possession, was collected quite recently by Mr. Harvey at Hornby Island. It is most

likely also that the fragments of the shell of a cephalopod from the Chico Group of California, for which Gabb proposed the name "? *Ammonites Cooperi*," are distorted pieces of *A. Vancouverense*, and if that be the case the laws of priority may require that the species shall be called *Anisoceras Cooperi*, Gabb. (sp.), as the description of Gabb's *Ammonites Cooperi* immediately precedes that of his *Hamites Vancouverensis*.

HETEROCERAS HORNBYENSE. (Nom. prov.)

Shell dextral, depressed turbinate, much broader than high, and composed, so far as is known, of five or six rounded, ventricose volutions, which are in close contact but without embracing; spire moderately elevated; umbilicus broad and deep, exposing the whole of the inner volutions.

Surface marked with simple and not very flexuous transverse ribs. Upon the last volution one or two continuous ribs without tubercles alternate with a rib or pair of ribs which bears or bear a small but rather prominent tubercle on each side of the periphery. Usually two ribs coalesce, both above and below, at each tubercle, but occasionally a single thickened rib bears a pair of tubercles. In places, also, where the test is preserved, the surface is seen to be marked with fine raised lines, parallel to the ribs. Sutural line unknown.

Maximum breadth of the outer volution of the largest specimen collected, nearly two inches and three-quarters.

Hornby Island, W. Harvey, 1894; two specimens, one with most of three volutions, and the other with the whole of four volutions and a part of the fifth preserved.

It is, perhaps, doubtful whether the distinctions between *Heteroceras* and *Anisoceras* can be maintained. In the one the earlier volutions are said to be always in contact, while those of the other are described as separate and as forming an irregular open spiral. The two speci-

mens from Hornby Island for which the foregoing provisional name is suggested, are coiled in precisely the same way as the *Heteroceras Couardi* of the Mesozoic Fossils,<sup>1</sup> and differ therefrom only in their much finer ribs and more particularly in the circumstance that some of these ribs bear a tubercle on each side of the periphery. On the other hand, the surface ornamentation of the only known specimens of *H. Hornbyense* is so like that of *Anisoceras Vancouverense*, that it is just possible that they may prove to be specimens of the early stage of large individuals of that species.

HETEROCERAS PERVERSUM. (Nom. prov.)

Shell sinistral, but in other respects essentially similar to that of the preceding species.

Hornby Island, W. Harvey, 1894; a single specimen about an inch and three quarters in its maximum diameter, with nearly the whole of one volution remarkably well preserved.

It is not at all unlikely that the early volutions of *H. Hornbyense* may be coiled indifferently to the right or left, and if so, that this may be a mere sinistral variety of that shell. Or, if *H. Hornbyense* should prove to be the apical portion of *Anisoceras Vancouverense*, it may be that the apex of that species is coiled to the right in some specimens and to the left in others.

Illustrations of each of the specimens referred to in this paper will probably be published in the fourth and concluding part of the first volume of Canadian Mesozoic Fossils.

OTTAWA, March 23rd, 1895.

EXPLANATION OF PLATE II.

ANISOCERAS VANCOUVERENSE.

Side view of the most perfect specimen known to the writer. Four-fifths of the natural size.

<sup>1</sup> Geological Survey of Canada, Mesozoic Fossils, vol. I., part 2 (1879), p. 100, pl. 12, figs. 1-3.

