

MASTODON REMAINS IN NOVA SCOTIA.—BY HARRY PIERS,
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While recently engaged in preparing suitable labels for specimens of a femur and molar tooth of the American Mastodon from Cape Breton island, which are preserved in the Provincial Museum at Halifax, I was led to make inquiries to ascertain as far as possible just what was known regarding their history, either in literature or as tradition among the old people of the localities where they were discovered. It was found that little was on record, and in fact the precise spots where they were unearthed were not at all definitely known, and other points required clearing up.

In order to facilitate future reference, I now venture to present a concise systematized account of all that is known of the only authentic existing remains of the Nova Scotian Mastodon, including interesting particulars from old persons who still remember well the original discovery. The time for rescuing any unrecorded facts was almost gone, and in a few years not a man would have remained who could have personally recalled any of the circumstances of one of the most interesting palæontological finds ever made in this province.

At the outset it may be observed that the paper does not intend to deal with the question of geological age, but it may be stated that there seems no reason to question the generally accepted conclusions on this point.

The Mastodons, of which about thirty species have been described, belong to the suborder Proboscidea (the Elephants), primitive forms of which lived in Egypt in the Middle Eocene, showing that Africa was the point of dispersion of the animals of this suborder. Mastodons made their appearance in Europe at least as early as the middle of the Miocene epoch and also

soon afterwards in Asia. From Asia they migrated to North America, and are there first met with in the Deep River and Loup Fork (Upper Miocene) beds of the central states. In the next ascending series, that of the Pliocene epoch, we find them still existing in Europe, Asia and North America (where they are rather common), and they then here found their way into South America. Finally in the Pleistocene epoch they are persisting and common in North America and have spread in South America, while they have disappeared from Asia and Europe, being there survived, as well as in Africa, by the existing genus *Elephas*. Some remains in the United States are said to have been found in association with stone implements, which if so, would indicate that there at least they must have survived till after the advent of man.

Name and Range.

Name and synonyms.—The species to which the Nova Scotian remains are referred, is the AMERICAN MASTODON, *Mastodon americanus* (Cuvier), which is considered to be synonymous with *M. ohioiticus* (Blumenbach) and *M. giganteus*, Cuvier. As only a couple of members of a skeleton (a thigh-bone and a molar tooth) are known from Nova Scotia, their reference to this species must for the present be considered as probably, but not positively, correct.

Range of the species.—Remains of the species occur in various parts of North America as far south as Texas. They are more or less common in alluvial deposits such as occur on a small tributary of the Osage river, Burton county, Missouri, and in a peat deposit at "Big-bone-lick," Kentucky; also in Orange county, and near Cohoes falls on the Mahowk and elsewhere in the lower Hudson valley counties, New York; and likewise in Indiana, New Jersey, Ohio, and numerous other places. In Canada they have been reported from Ontario, Manitoba, the Yukon, and Nova Scotia.

Femur.

Description.—The first specimen in the museum is a right femur (thigh-bone) of an adult animal, agreeing generally in form with that of *M. americanus*. It is in a very good state of preservation, the bone tissues being firm and practically unaltered, but longitudinally cracked in a few places. Remains of the cartilage may still be seen on a few places on the articular surface of the head of the bone. In parts, particularly about the region of the extremities (trochanter major and the condyles) the outer surface is somewhat worn off, exposing the cellular under parts. In the vicinity of the internal trochanter a portion of the bone has been broken off.

Measurements.—Greatest length from head to inferior extremity near condyles, 3 ft: 10.50 in. Diameter of body of femur in middle, 7.35 in.; anterior-posterior diameter at same place, 4.60 in. Greatest width from head to region of trochanter major, 1 ft. 5.50 in. Diameter of head, 8 in.; diameter of neck, 6.40 in.; anterior-posterior diameter at last-mentioned place, 5.60 in. Diameter at condyles, 10 in.; anterior-posterior diameter at condyles, 7.75 in. These measurements would indicate an animal that would have measured about 10½ feet to the shoulders, which very nearly equals the height (11 feet) of Dr. J. C. Warren's immense Mastodon skeleton from Newburg, N. Y., now in Boston.

Locality where found, and collector's name.—Found by the late Alexander McRae, at a depth of about five inches from the surface, in meadow soil containing some sand, on "intervale land," on farm of said McRae (now owned by his nephews, Duncan and Daniel McRae), one-half a mile westward of the road at the schoolhouse, Lower (Settlement) Middle River, Victoria county, Cape Breton island, Nova Scotia.* The precise spot where the bone was found is close

* Hon. W. F. McCurdy of Baddeck writes me that he thinks some of the farmers at Middle River thought it might benefit them if they were to cut a canal through a gravel bank and so change the course of the river. They accordingly made the canal with the result that the river cut away a large quantity of gravel, etc., and so revealed the Mastodon remains. Honeyman states the femur was ploughed up.

to the eastern bank of the Middle river, and $1\frac{1}{2}$ miles south 15° east (true bearings) of the junction of Leonard McLeod brook (Middle River) with the Middle river. Compare Geological Survey of Canada, Nova Scotia map sheet no. 13. (*Vide* information supplied by Duncan McRae, nephew of the original finder).

The oldest mention of the bone in a Mechanics' Institute inventory of about 1835, merely gives the locality as "the Island Cape Breton." The earliest label, in Dr. Honeyman's writing, of about 1870, states it was found at "Middle River, C. B." Honeyman in his *Giants and Pigmies* (p. 87) says it was ploughed up on the intervale of Walker's farm, at Middle River, about nine miles from its mouth. The McRae farm, however, where the bone was discovered, was never owned by a Walker, nor was there a Walker family settled there. Alexander McRae had inherited it from his father, and it is still possessed by McRaes.

Date of discovery.—The femur was found about 1834 or a few years earlier. One of the latest stick-labels on it, in Honeyman's writing, gives the date as 1842, but this is an error, as well as his statement in *Giants and Pigmies* that it was found about forty years before, that is about 1846. The first record I find of it is in a manuscript list of articles in the Halifax Mechanics' Institute (founded in 1831), undated, but written on paper watermarked "1833" and therefore prepared approximately about 1835, where it is entered as "Right thighbone of the Fossil Elephant found in the Island Cape Breton, [Presented by] Peter H. Clark, Esq." Then in a manuscript inventory of apparatus, models and specimens in natural history in the museum of the same institution, prepared by C. Creed in June, 1839, we find listed the "Femur of fossil Mastodon." An inspection of lists of donations to the Institute, usually given annually in the *Nova Scotian* newspaper, may fix the date. The late Alfred F. Haliburton, of

Baddeck, told me some years ago, that according to his recollection the date would be approximately about 1836.

Donor's name.—From Alexander McRae the specimen passed to Peter Hall Clarke of Sydney, afterwards (1844) a member of the legislative council, who presented it to the then recently organized Halifax Mechanics' Institute in whose museum it remained until it was transferred to the Provincial Museum of Nova Scotia on the latter's foundation in October, 1868, where it is still preserved.

Geological age.—This bone may be fairly safely assigned to the very close of the Pleistocene (or Glacial) epoch or the opening of the Recent (or Post-glacial) epoch. The underlying formation is carboniferous limestone.

Dawson in the first edition of *Acadian Geology* (1855) speaks of its having been found in superficial gravel, and says it probably belonged to the close of the glacial or drift period, and that the species was probably extinct here before the introduction of man. Honeyman in his *Giants and Pigmies* (1887), pp. 87-89, states that he had hitherto held the opinion "that it was of post-glacial age, that it was contemporary with the American mammoth, both being of Pleistocene age and of the Champlain period," but on certain geological considerations he says he has now been led to regard it "as contemporary with the Europeans." Does he mean the European mastodons? Dawson in his *Handbook of Geology* (1889), p. 157, very slightly modifies his earlier view, and refers it to the post-glacial or late glacial age, "possibly" extinct before the introduction of man, though he rightly notes that the Miemac Indians seem to have had traditions of its existence.

Remarks.—Honeyman (*Giants and Pigmies*) says the discovery of this bone caused considerable excitement, and that Admiral Dundonald (who was on this station from 1848 to 1851) and Dr. Abraham Gesner visited and explored the spot with the expectation of making further discoveries of remains,

but without success.* As the place is thoroughly cultivated, it is exceedingly doubtful if mere superficial examination would disclose anything further, but it is quite possible that the sub-soil may yet hide other parts of the skeleton.

References and figures.—Manuscript lists of articles in the Halifax Mechanics' Institute, *circa* 1835, and June, 1839. Dawson (Sir J. W.), *Acadian Geology*, 1st ed., 1855, pp. 57-58; 2nd ed., 1868, p. 83, with figure on p. 84; 3rd ed., 1878, do.; 4th ed. (*Geology of Nova Scotia, etc.*), 1891, do. Honeyman (Rev. D.), *Giants and Pigmies*, 1887, pp. 87-88. Dawson (Sir J. W.), *Handbook of Geology*, 1889, p. 157. McRae (Duncan), information in manuscript furnished by him, February, 1912.

Molar Tooth.

Description.—The tooth is a molar, probably a second one, but I am not able to say whether it is from the right lower or the left upper maxilla. It has three well defined transverse "nipple ridges" on the crown, but with very inconspicuous tubercles thereon, and no cement in the hollows of the enamel, etc. The roots or "fangs" are two, the anterior one much smaller than the posterior one. In the latter, which has perhaps been slightly broken or eroded at the apex, is the nerve and artery canal open at the apex of the root and bifurcating at the inner extremity where it communicates with the pulp-cavity. The enamel is jet black externally, and white within. The black layer occupies from nearly nothing to about one-quarter of the total thickness of the enamel. The dentine is of cream colour. The tooth was in good preservation when found, but unfortunately the finders undertook to investigate its structure with the aid of a blacksmith's hammer and vice, and so

*D. J. McRae of Baddack, a relative of Alexander, says that in 1850 Admiral Dundonald with his ship was in the Bras d'Or. and having heard of the finding of the Mastodon remains, went to Middle River with a number of his sailors, and that the Admiral took away to England a broken "tooth" (tusk?) which had been found there but that it was afterwards returned to Nova Scotia. While this fixes the time of Dundonald's visit, there can be little or no doubt that the tusk from Middle River was taken from there prior to 1835. See remarks on the Tusk

succeeded in breaking off part of one of the end transverse ridges, as well as about half of the enamel, thus leaving the yellowish dentine of the crown exposed. Otherwise it is in excellent condition.

Measurements.—Greatest length of crown, 4.35 ins.; greatest width of crown, 3.10 ins.; summit of posterior transverse ridge to apex of larger root, 3.90 ins.; summit of anterior transverse ridge to apex of smaller root, 2.80 ins.; height of crown from summit of transverse ridges to base of roots, 1.60 in.; greatest height of transverse ridges (apices broken off), .75 in., but original height probably 1.10 in.; thickness of enamel, .16 in.; depth of nerve canal to its bifurcation, 1.30 in.; greatest diameter of nerve canal at exterior opening, .50 in.

Locality where found, date, and collector's name.—Found in 1859 at Baddeck, Victoria county, on the northwestern side of Little Bras d'Or lake, Cape Breton island (*vide* Dr. Honeyman's original label). This is $8\frac{1}{2}$ miles east-southeast of the place where the femur was discovered. I had suspected that possibly the tooth might have been obtained at the latter place and carried to Baddeck, but Duncan McRae assures me that he never heard of such a tooth having been found on his farm at Lower Middle River. It was presumably found by a resident of the district, but his name is not now known. Dawson is in error in saying it was discovered by Dr. Honeyman. Strange to say, Hon. W. F. McCurdy, of Baddeck, writes me that he has been unable to find anyone who now knows anything of such a tooth having been found at Baddeck or Baddeck river.

Donor's name.—Dr. Kier of Princetown, Prince Edward Island, obtained it from the finder, and shortly prior to 1862 gave it to Dr. Honeyman, who deposited it in the Provincial Museum in 1868, where it is still preserved.

Geological age.—Doubtless precisely the same as in the case of the femur.

Remarks.—The size of the tooth indicates that it belonged to an individual smaller than that from which the femur was derived. These specimens therefore show that two Mastodons at least existed in Cape Breton island, no doubt both belonging to the same species. The tooth was shown by Dr. Honeyman in the Nova Scotian palæontological collections of the exhibition at South Kensington, England, in 1862, and he then compared it with many teeth of *M. americanus* in the British Museum, with which it agreed.

References and figures.—Dawson (Sir J. W.), *Acadian Geology*, 2nd ed., 1868, p. 83, with figure showing outer side, reduced to about half natural size, on p. 84; also in subsequent editions. Honeyman (Rev. D.), *Giants and Pigmies*, 1887, p. 88.

Tusk.

Tusk.—In the beforementioned manuscript list of articles in the Halifax Mechanics' Institute museum, prepared about 1835, there is listed a "Large tooth of some unknown animal found in Island Cape Breton, presented by Mr. Le[o]nard," as well as the right thigh-bone already described. In Creed's inventory of June, 1839, we find "Femur of fossil Mastodon; tooth of do. do.," and Dr. Honeyman has written opposite the "tooth," *not found*, that is when he took over the museum in 1868.

Dawson (*Acadian Geology*, 1st ed., 1855, p. 57) says that the thigh-bone in the museum of the Mechanics' Institute and some fragments of a tusk were the only remains of the Mastodon he had up to then actually seen in the province, and furthermore states that he had not seen any teeth. As Dawson was very familiar with the contents of the Institute museum, there can be no doubt that he considered the so-called tooth to be fragments of a tusk or highly developed upper incisor tooth of the animal.

Honeyman (*Giants and Pigmies*, 1887, p. 88) states that he found in the Mechanics' Institute museum tusks which were supposed to be parts of the Mastodon tusks, but which he says were tusks of the walrus. It seems almost positive that he was in error about this, and that the original tusk had been lost, or loaned for examination and never returned, prior to his taking over the collections in 1868, and that he had come to the conclusion that one of the walrus tusks which he later found in the museum must have been mistaken for it.

That a tusk or part of a tusk was actually found on the McRae farm at Lower Middle River, Victoria county, is very strongly supported by Duncan McRae (memorandum of February, 1912) who distinctly remembers that a "large tooth [i. e., tusk] shaped somewhat like a sickle" was found on the McRae farm a short distance from where the thigh-bone was discovered, and I suppose at or about the same time, and that a man whose name he does not know, who had been sent down from Halifax, went there and took it away to Halifax. It was so large that this man, when he departed with it, "slung it across his shoulder," but the incident took place so long ago that McRae does not remember the exact length of the relic. This, in my opinion, was without doubt the tusk or "tooth" which was afterwards in the Institute museum, presented by a Mr. Leonard, listed in the beforementioned inventories, seen by Dawson prior to 1855, but which was lost before 1868. The sickle-shape shows it was a long "tusk," not an ordinary molar tooth. McRae says he had never heard of anything else resembling a tooth having been found at Lower Middle River, nor any other remains but the thigh-bone. The Mr. Leonard mentioned as having presented the so-called "tooth" to the Institute museum, was very likely Charles E. Leonard who was prothonotary, etc., of Sydney in 1833, or some other member of that family.

Other Remains.

Dawson (*Acadian Geology*, 1st ed., 1855, p. 58) says that while the femur and tusk fragments were the only remains he had then seen in the province, yet he was informed that others had been found, though several of the best specimens had unfortunately been lost by shipwreck.

The late Alfred F. Haliburton of Baddeck, Victoria county, sergeant-at-arms of the house of assembly, assured me, about 1901, that he was with those who brought away the Mastodon remains or some of them in a canoe from Middle River. I distinctly understood him to refer to that locality when he was speaking, and he thought the date would be about 1836 according to his recollection. He said they also had a skull or part of a skull of the animal, but it was lost by the upsetting of the heavily-laden canoe, presumably in the Middle river. It would seem as though this was what Dawson referred to when he said that some of the best specimens had been "lost by shipwreck." Duncan McRae, however, writes me that he does not remember ever having heard of this skull or of any specimens having been thus lost, the only remains he recalls being the femur and the "sickle-shapel tooth" as he calls it.

The Possibility of finding other Remains.

One purpose of this paper has been to draw attention to the advisability of making search here for further remains of the Mastodon, as well as to make a systematic record of all the obtainable information regarding such as have been already discovered.

It seems hardly possible that we have already discovered the only existing remains of the Mastodon that are in the province; and it would be well if we were to carefully investigate every reported case, that may come to our knowledge, of large bones being found anywhere, particularly at a distance from the sea, as at the latter remains of cetaceans are often met with. While the island of Cape Breton naturally suggests

itself as a most promising field for search,—and perhaps, as some have supposed, the reported lesser glacial erosion there might be a favourable factor,—yet the whole province should not be neglected.

A Micmac Indian, known as “Dr. Lone Cloud” or Jerry Bartlett, informs me that about 1874 a very old Indian woman, Magdalene Pennall of Sissiboo (Weymouth), Digby county, informed him that there had then been long known to her people certain very large rib-bones, which they supposed to be “whale ribs,” on the barrens about two or three miles south-eastward of Blue Mountain lake, about twenty-five miles from the sea, in the northeastern part of Yarmouth county, N. S. The place is a very short distance east of Bloody creek or brook (a tributary of the Clyde river) and on a trail from that creek via Long lake, to the head-waters of the Shelburne or Roseway river to the eastward. On one occasion, Mrs. Pennall and her husband, Joe (Kophang), just after having left their canoe on Bloody creek, killed a moose at the spot where the bones were, and as a thunder shower came on they stood three of the large ribs against a rock, covered them with the moose-hide, and so formed a shelter. Some of the ribs which were on the ground were covered with a thick mantle of moss. Lone Cloud thinks there may have been some vertebræ there also, but knew of no other kinds of bones. Once some Indians carried away one of these big ribs, but as it was very heavy it was at last dropped, and the superstitious Indians affirmed that it was afterwards found once more in its original place, which caused the remains to be regarded with some veneration by members of the tribe.

The same Indian was also informed by John Jadis, a venerable and well-known Indian still living at Enfield, that very many years ago there were found at the Horne settlement at the outlet of Grand lake, Hants county, twenty-six miles from the sea and in the very heart of the province, some large vertebræ which were thought by the old inhabitants of the

district to be parts of a whale's backbone, and they were used as little stools to sit on. These have long ago disappeared, and the present Hornes know nothing of them. What particularly puzzled the Indian was, how "whale bones" could get to such inland places as the two just mentioned.

I have never seen these so-called whale bones, but one naturally ventures the opinion that possibly they may have been Mastodon remains, and that those traversing our wastelands, as well as those cultivating surface deposits, should keep a sharp look-out for any such large bones, particularly at a distance from the sea, and should any be discovered some authority's opinion as to their identity should by all means be obtained.

A supposed Mastodon's skull was recently found on the shore of the Bras d'Or lake and was forwarded to the museum of the Provincial Normal College at Truro. This immediately aroused interest, but on examining photographs of it, I identified it as the cranium of a cetacean, the Black Fish (*Globicephalus melas*).

Halifax, N. S.,
13th May, 1912.