DISTRIBUTION

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Limnæa Emarginata, Say,

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Var. Mighelsi, Binney,

IN FISH RIVER,

AROOSTOOK CO., MAINE.

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LIMNÆA EMARGINATA AND THE VARIETY MIGHELSI OF FISH RIVER LAKES, AROOSTOOK COUNTY, MAINE.

In 1821, Thomas Say published in the Journal of Academy of Natural Sciences of Philadelphia, Limnæa emarginata discovered by Mr. Aaron Stone in lakes of Maine.

Mr. Alexander W. Longfellow, a brother of the poet Longfellow, while exploring and surveying the northeastern boundary in the summer of 1842, discovered in Second Eagle lake a Limnæa, named by Dr. J. W. Mighels L. ampla, and published in the Boston Journal, Natural History, Vol. IV, 1843. Mr. A. W. Longfellow asserts this specie was very abundant on the shore in Second Eagle lake, summer 1842, but he had no means of preserving any more than four specimens.

Prof. Edward L. Morse and John M. Gould made a careful survey of Mud lake in 1852 and found but six or seven dead specimens. See Journal of the Portland Society of Natural History, Vol. I, 1864.

To my knowledge there has been no further notes made of this very interesting shell of Aroostook. My first visit to Square lake in June, 1889, one large shell was picked up at the inlet. In August, 1891, and September, 1892, five specimens were obtained. In August, 1893, a good lot of shells were obtained at the same locality and sent to Prof. H. A. Pilsbury of Philadelphia for identification. Prof. Pilsbury wrote me thus: "Give particular attention to collecting a good lot of Limnæa emarginata and especially the variety mighelsi, as they are very interesting."

In company with Lars Nylander, I passed three weeks during August and September, 1894, and made a collection of fossils and shells at Gross, Square, Eagle and Portage lakes and many fine specimens were secured. Some lower Helderberg fossils were discovered in Eagle lake. Corals, Crinoid stems, Strophomena rhomboidalis, Wlk., Orthis varica, Con., Trematospira Multistriata Hall and Platyceras. Nils Esbjornson assisted me during a three weeks' trip in 1896, and special attention was given to the collection of living shells of Fish river. By careful search around the shores of the lakes and by dredging in the deep water, many interesting specimens were secured. The dredge used was sent me by Bryant Walker, Esq. of Detroit, and many valuable favors have been received from him. In regard to the large pond snails sent him, he wrote as follows: "The Limnæas are by all odds the finest I have ever seen. Our Michigan samples do not begin to compare with them."

In June, 1897, Prof. Frank C. Baker of Chicago wrote me: "The writer is gathering materials for an illustrated monogroup of North American Limnæidæa and desires to obtain as full a set of specimens as possible from different locatities." A good lot of specimens were sent to him and he said: "The lot is a splendid one, particularly the L. emarginata, which is the finest I ever saw." At different times living alcoholic and dry specimens were sent to Prof. Baker and the result of his careful studies were illustrated and published in a Bulletin, Vol. II, of The Chicago Academy of Science, June, 1900.

In order to obtain all possible information in relation to Maine shells, I made a special trip to Orono, Waterville, Portland, Boston and Cambridge, and was permitted to examine the different collections, but I am sorry to state that at neither of the places visited did I find a collection of the large pond snails of Aroostook. The specimens vary greatly in form, and of the many thousand varieties seen and collected, there are hardly two alike.

Prof F. C. Baker writes: "No published figures show the wide range of varities in this species***unlike some species, this form does not vary according to any particular locality, but the same locality will produce all known varieties. A naturalist fond of making species, could form not only a large number of species but several genera. Anatomically the animals show no such variation but are wonderfully uniform."

The Limnæas of Fish river lakes are very abundant some years. In 1893-4-5-6, thousands of specimens might have been collected at Square lake inlet, at low water mark. In 1898-9-00, they were not so common. D. E. Johnson, Supt. of Caribou fish hatchery, who had made collections for me several times, informs me that he could only find a few young and some dead shells at the above locality in August this year.

At Cross lake, specimens were common at the inlet in 1894-6, and this summer, in August or September only a few young shells could be found by me.

In second Eagle lake or Mud lake (the latter being the common name) A. W. Longfellow stated that specimens were abundant in 1842. Prof. E. S. Morse found only a few dead shells in 1859. John Storey and William Roach of the Caribou fish hatchery, informed me that they collected a good lot of specimens in Mud lake in 1898, and D. E. Johnson informed me of a large colony in 1900. This year in August and September, I collected a good lot of specimens and at the inlet they were abundant. In Eagle and Portage lakes I have never found them in abundance.

A colony was discovered in Fish river at Fort Kent in August, 1899, and few specimens were found in the St. John river, one-half mile above Fort Kent on the U. S. side.

In Aroostook river, just above the Caribou stream, I have collected specimens every season for the past eight years and this is the only colony I have found in this river from Ashland to the boundary line.

EXPLANATION OF PLATES.

Long lake is the head of the east branch of Fish river. Only a very small part of this lake has been examined by me. Near the outlet several species of shells were obtained, but not a single specimen of Limnæa. A thoroughfare, one-half mile in length, connects it with Mud lake. In the lower half of this thoroughfare Limnæa emarginata commences to appear and is very abundant at the outlet in Mud lake. *See plate 1, fig. 1-10.* This is undoubtedly the original locality where Mr. Longfellow discovered his specimens in 1842, and the name Limnæa (Radix) ampla was given the shells by Dr. I. W. Mighels. It is a very easy thing to name a specimen, but the criticism will come after, and if the same name has been used for a specie of the same family it must be changed.

In 1842 Hartman published Limnæa (Gulnaria) ampla of Europe. *See plate 1, fig. 18-19*, drawn from specimens collected by A. S. Oberwimmer, Vienna, Austria. Some authorities claim L. ampla is only a variety of Limnæa auricularia Linne also of Europe. *See plate 1, fig. 16-17.* Specimens from Elbe river, Germany.

The best authorities agree that our shells are only a variety of Limnæa emarginata Say, and W. G. Binney in Smithsonian miscellaneous collection, land and fresh water shells of North America, part II, 1865, in a foot note proposes the name Mighelsi for the variety and this is generally adopted.

Plate 1, fig. 11-15, is from the lower left-hand side of Mud lake. The specimens in this lake are small, (eight-horn, colored, sometimes ornamental, with revolving bands; the color of this animal varies. The specimens at the water edge are bluish-black or gray, and those in deep water are very light and sometimes orange. Specimens are most common at low water mark, the ~~water being~~ about three feet in depth, gravel botton, where they feed on Confervæ, growing on the rocks. This shell is a typical Limnæa emarginata Say. Dredging many places in this lake from 3 to 13 feet not a single specimen of the above were obtained. On the sand and gravel bars formed at the outlet in Cross lake a colony of shells appear. They are somewhat larger in size than those in Mud lake, with a shorter spire and a wider aperture. *See plate 2, fig. 1-6.* These specimens are very abundant some years. This summer in August, only a few young shells could be found. The variety named mighelsi will be found to correspond better to these shells than those found in Mud lake. On the west side, about two miles south from the inlet at Cranberry Point in two feet of water a colony of large specimens of the variety mighelsi is found. *See plate 2, fig. 7-11.* Cross lake is 5 miles long and 1 1-2 miles wide. Few specimens have been dredged at the south end of this lake.

Entering Square lake to the right is a large sand and gravel bar and a large sheltered cove where Limnæa emarginata var. migelsi Binn., are, some years,very abundant, attains the largest in size and the most variable in forms of any known. *See Plates 3-4.*

Fig. 2, 3, 4, 5 and 6, plate 3, are the most common forms found, in from one to two feet of water. Fig. 12-20 on the same plate is found living on the rocks at low water mark. Fig. 1, a very large shell, was found on the other side of the bar in three feet of water. Fig. 1-2, plate 4, were obtained in the main current at the inlet and is a very rare form. Fig. 3-11 are some of the largest specimens found, and the extreme variations of this shell is remarkable and nothing in existence in this part of the country its equal. Fig. 12 on this plate is a broken shell to show the internal form of the spire or columella, as it is generally called. All fig. are natural size.

At the south end of Square lake large specimens, similar to those above, are sometimes found on the beach after storms. Square lake is one of the largest and handsomest lakes in Maine and empties in Eagle lake through a thoroughfare, 4 miles long. The water in Eagle lake is deep. and only a few large shells have been found. *See plate 2, fig. 12-14.* Eagle lake, 18 miles long and 2 miles wide, forms the main basis for the south and east branches of Fish river and empties in the St. John river at Fort Kent. This stream has cut its canal through slate ledges of the Oriskany formation, and near Fort Kent I have collected crinoid stems, Leptocælia flabellites, Conn., Platyceras and Fucoides in abundance. Probably all the slate for 20 or more miles to the west might be included in the Oriskany group. At the mouth of Fish river is a large gravel bar running out into the St. John river, and between this and the point where the old Blake house stands is a small colony of Limnæa emarginata Say. *See plate 2, fig. 29-34.* The specimens are of small size, and the interesting fact is, they correspond in general with those found at Mud lake; the largest specimens are found at Square lake. The small shells at Fort Kent and Mud lake compare very well with a colony of Limnæa emarginata Say found in Aroostook river at Caribou. *See plate 2, 15-17.* Caribou is 30 miles from Mud lake and 44 miles from Fort Kent.

Portage lake, on the south branch of Fish river is about half way of this branch. At Oak Point and along the east side of this lake specimens of medium size of Limnæa emarginata var. mighelsi, Benn., are sometimes found in two or three feet of water, See plate 2, fig. 18-22. The specimens in this lake are more frequently adorned by light colored bands than any of the others.

Portage lake empties in Eagle lake through an 18-mile thoroughfare, including Saint Froid lake. Small colonies are also found in several places along the gravel bars. See plate 2, fig 23-28. The specimens are about the same size as those in Aroostook river.

The 85 figures on the four plates are all natural size, and will give a good idea of the great variations in the Limnæa emarginata. This is also a record of all the localities where I have found these interesting shells in Aroostook county, Maine.

Caribou Maine, Oct. 1901.

PLATE I.

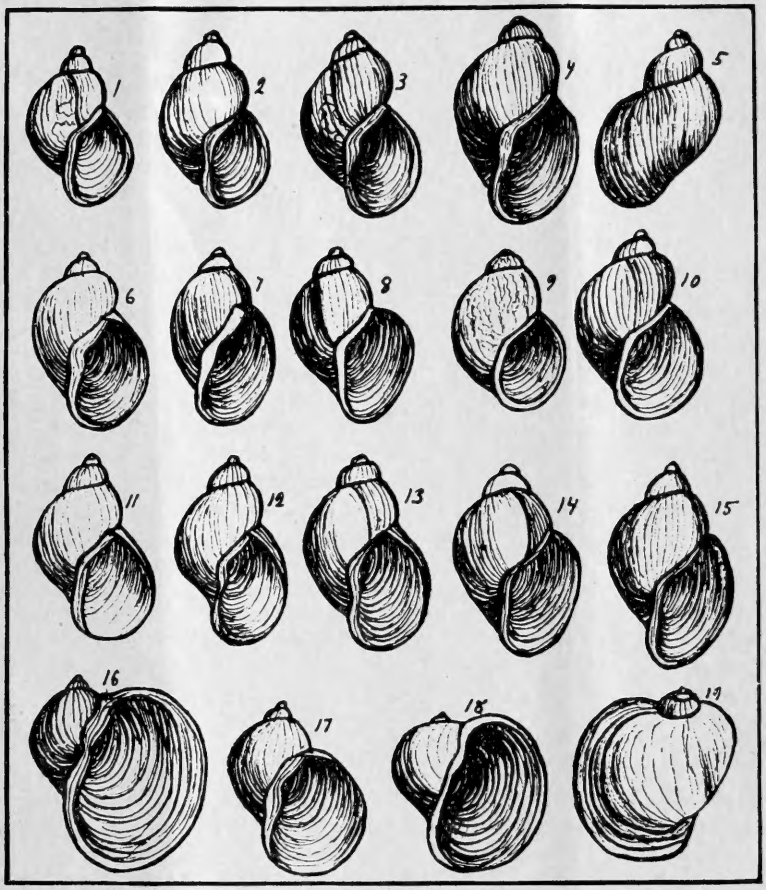

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Fig. 1-15, Mud Lake. Fig 16-17, L. auricularia, Elbe River, Germany. Fig. 18-19, L. ampla, Neustadt Channel, near Vienna, Austria.

PLATE II.

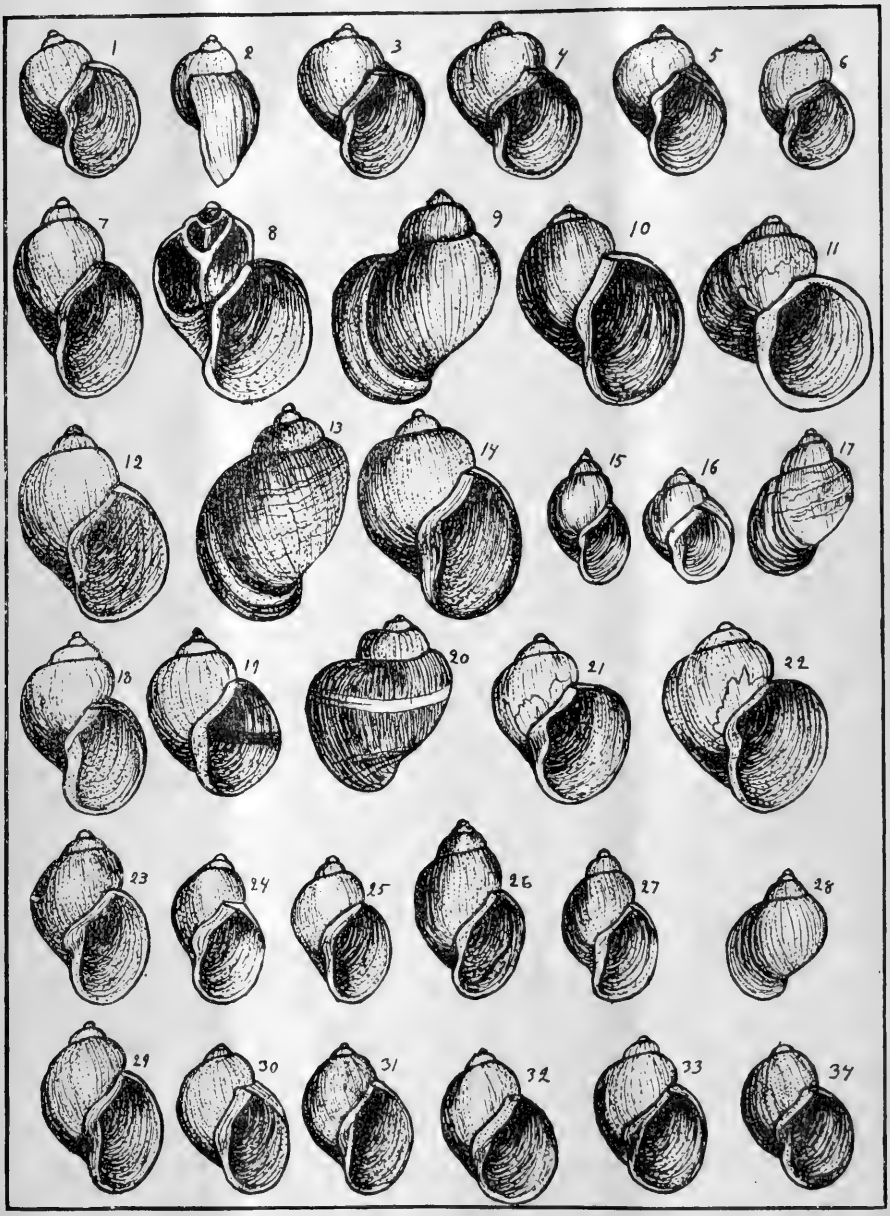

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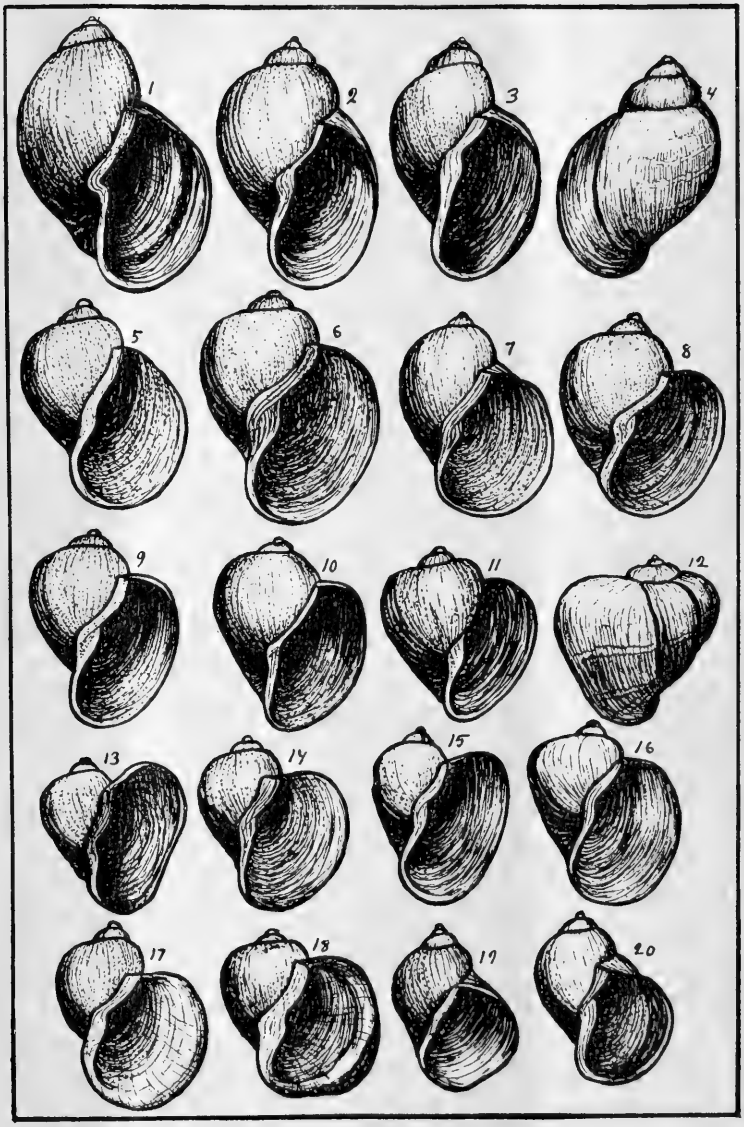
Fig. 1-11, Cross Lake. Fig. 12-14, Eagle Lake. Fig. 15-17, Aroostook River. Fig. 18-22, Portage Lake. Fig. 23-28, Thoroughfare between Portage and Eagle lakes, Fig. 29-34, Fish River, Fort Kent.

PLATE III.



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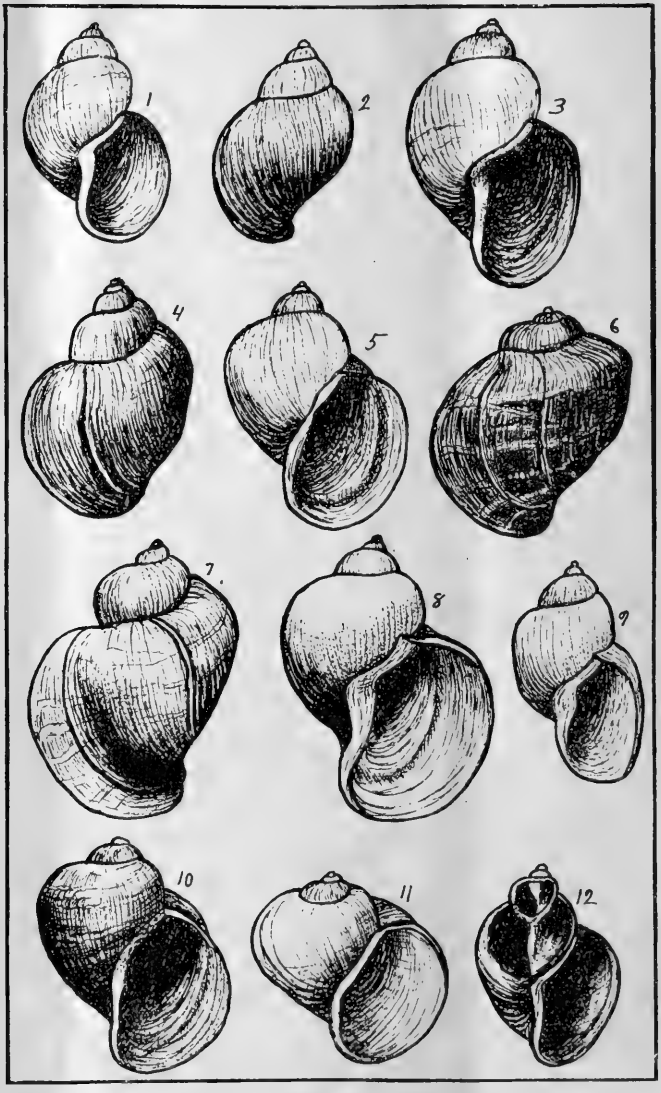
Limnæa emarginata, var. Mighelsi, Binney.
Square Lake Inlet.

PLATE IV.



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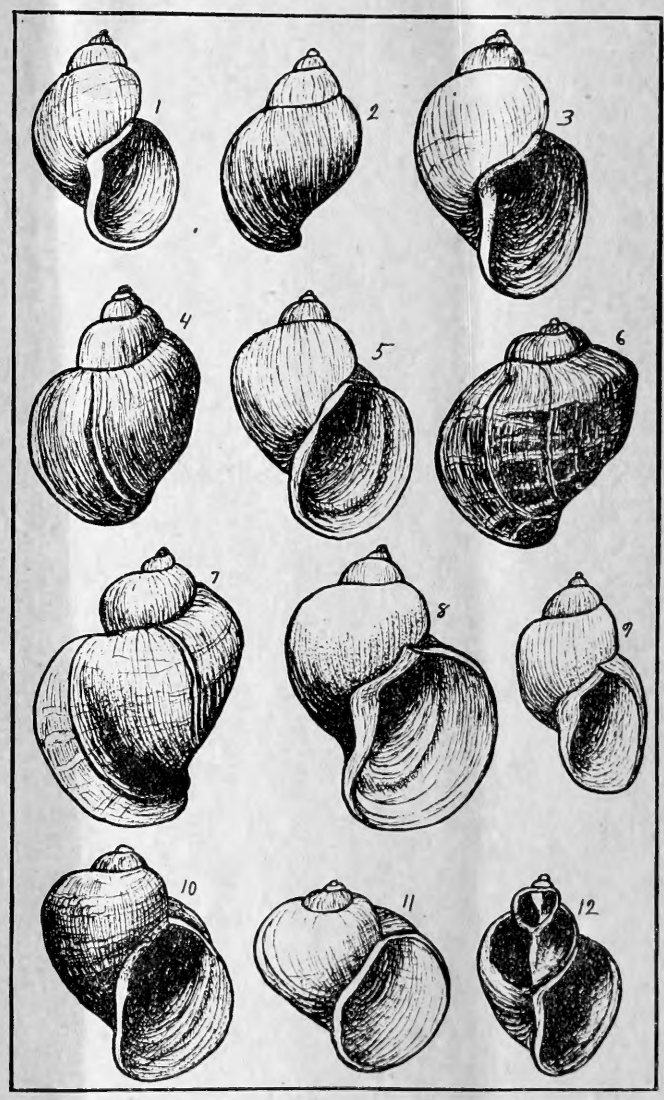

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Limnæa emarginata, var. Mighelsi, Binney.
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