

6. *Amnicola porata* Say.

	H.	W.	A.H.	A.W.
a. Marl form, MacKay Lake...	4.2	3.5	2.23	1.75
b. Living form, MacKay Lake...	4.2	3.62	2.1	1.73
c. Chicago form...	5.00	4.25	2.8	2.08

These figures show that a. and b. are practically identical in measurements.

This species has not changed at all in the area under discussion but neither its marl environment nor its present one in MacKay Lake have allowed it to attain its maximum growth. This is seen by comparing them with normal forms from the Chicago area which are much larger as shown by the figures above.

7. *Limnaca galbana* Say was first described as a fossil and has since been found living. It was not found living in MacKay Lake. The specimens from the marl beds average a little larger than Say's type. This species is such a persistent member of the marl bed faunas throughout the Northeastern United States and Canada that it seems especially fitted for such a habitat. The living species prefers clear water more or less in movement, which fact probably excludes it from the lake at present.

8. *Pisidium abditum* Haldeman.

	Height	Width	Length
a. Marl form.....	2.25	1.96	2.62
b. Present form.....	3.25	2.83	4.03
c. Chicago form.....	Measurements not available.		
Ratio b:a	1.44	1.44	1.54

P. abditum is the only pelecypod found common to the fossil and present faunas of MacKay lake. The figures above show the present form to be much larger than the fossil shell.

It is interesting to consider for a moment the pelecypod fauna. *Pisidium abditum*, the only representative in the marl, is uniformly small, and, though fairly abundant, is not comparable in numbers at all with the gastropods. In the present lake fauna *Lampsilis radiatus* and *L. lucolis* are found but in small numbers, and not far from the outlet. These members of the Unionidae cannot thrive apparently in stagnant water. On the other hand, the members of the Sphaeriidae, represented by *Sphaerium simile* and the species of *Pisidium* are to be found in fairly large numbers in these waters.

DEPAUPERATION.

An examination of the data for the species discussed above shows all the fossil forms with the exception of *Amnicola porata* and *Planorbis bicarinatus* to be smaller than their existing descendants in the lake of to-day. Even these exceptions are smaller than normal. The tables show that ex-

clusive of ostracods only eight species are common in the marl beds while sixteen are found in the present lake and this number would be exceeded if an exhaustive search were made. What caused the depauperation of the marl bed fauna? As noted above it seems probable that the bottom environment had a great deal to do in this connection and that the marly bottom was very unfavourable to most of the species. No marl is being deposited in the lake at the present time. But in the shallow bay to the east the bottom is composed of this material. This represents either an old marl bed in situ below water level or the accumulated wash from higher beds. The water is seldom more than four feet in depth in this bay. A very small amount of muddy sediment overlies this marl and is covered by a scanty aquatic vegetation consisting mainly of algae. The molluscan life in this area is scanty, few living shells were obtained, and these were mostly the ubiquitous species *Valvata tricarinata* and *Amnicola porata*. The latter was mostly found attached to the submerged plant stems and comparatively few were found on the bottom itself. *Pisidium* can live attached to algae and other aquatic plants, and thus remain somewhat away from the influence of the marl. The heavy shelled forms like the Unionidae, however, must live directly on the bottom. The marl acts unfavourably on such species probably by clogging their gills. It is not surprising therefore, that these forms are entirely wanting in the marl fauna.

In contrast, on the western side of the lake there are two different types of bottom, one composed of soft mud with an abundant plant growth, while the other is composed of rock covered with debris both organic and inorganic. The first named area provided every species obtained in the lake in great abundance except *Campeloma decisum*, *Lymnaea stagnalis*, and *Planorbis trivolvis*. The two latter species were found here also but were attached to submerged objects and not on the bottom. The rock covered with debris had also a considerable fauna—much greater than that of the marl beds in the eastern bay so it seems that here at any rate the marl bottom is prejudicial to a flourishing molluscan fauna. The marl bottom is not conducive to growth of many water plants. Certain algae and other low forms are the most common. Such species as *Amnicola*, small forms of *Planorbis* and *Valvata* can attach themselves to these algae but prefer lily stems and pads and other plants with vigorous stem and leaf growth.

As mentioned above the marl matrix is not composed of shell fragments but of a fine impalpable powder of calcium carbonate. Two theories have been propounded to account for such a type of de-