

PRESENCE OF LIVING ORGANISMS IN LAKE ICE

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The object of these experiments and observations was to determine what forms of life were existing in the ice of Lake Decatur. Lake Decatur is an artificial Lake seven miles long and one-half mile wide, created by damming the Sangamon river. The depth of the water varied from a few inches to forty feet. The periods at which the materials were collected were during zero weather when the Lake was entirely frozen over. The thickness of the ice ranged from eight to twelve inches.

On January 7, two samples of ice and two samples of water from below the ice were collected. The ice was taken from the surface near the shore and from the center. Each sample was immediately placed in sterilized bottles containing sterilized hay infusion and plugged with cotton. The samples of water at a temperature of $\frac{1}{2}$ degree Centigrade were taken from the holes from which the ice was cut. The samples were placed in similar bottles and under the same conditions. A sample of mud from near the shore was also treated in the same manner. In the cultures from the ice and hay infusions, observations were made January 23, January 28, and February 6. On all these dates various bacteria were common. The only other form of life observed was *Chlamydomonas* which was present in small numbers on January 23, but multiplied rapidly enough to be common on the other observation dates. In the cultures from the hay infusion, and lake water or mud examined under the same conditions on the same days, *Chlamydomonas*, *Urosomas*, *Chilomonas*, *Coleps*, *Pleuronema*, *Stilonichia* and many other unidentified protozoa were observed.

On January 25, two samples of ice, four of water and two of mud were collected and treated the same as those collected January 7. Nutrient agar was substituted for the hay infusion. Observations were made January 31 and February 7. The results were practically the same. *Chlamydomonas* and bacteria were the only forms of life in the ice cultures. *Chlamydomonas*, *Leucophrys*, *Para-*

mecium, Ameba, and other protozoa were common in the water and mud cultures.

On February 22, four samples of ice and two of water were collected and treated the same as before. Three cultures of sterilized lake water and nutrient agar were made at the same time and subjected to the same conditions in order to determine if infection from the air could account for any of the resulting forms. Observations on all these cultures were made February 27 and March 4. In the ice cultures, Chlamydomonas and bacteria appeared. In the water cultures, Chlamydomonas, Pleuromonas, Ameba, and other protozoa were common. In the sterilized lake water culture used as an additional check, no forms of life were present, indicating that the probability of the origin of any of these forms from the atmosphere was slight.

On February 7, four cultures of Chlamydomonas, containing also Paramecium, were frozen from twelve to twenty-four hours and then thawed. The cultures were kept isolated and were observed February 14. The only forms observed after thawing were Chlamydomonas and bacteria. These organisms were present in all four cultures. The Paramecium which were common before freezing never appeared after freezing and thawing.

In the eight samples of ice collected from Lake Decatur at three different dates, bacteria and Chlamydomonas seemed the only forms present. From the water just under the ice, many different protozoa were obtained. In all the cultures, except those of sterilized lake water, bacteria were observed, but were not regarded as of much significance as they easily withstand freezing and thawing. It seems that Chlamydomonas is the only form of protozoa in Lake Decatur able to survive freezing and thawing.