

monodon, *S. hirsutum*, *Treodopsis appressa* (Wetherby). The species are all of kinds now living in the vicinity of the several localities.

The shells of the Iowa lake are much below the natural size of the species, showing the depauperating effect of the cold water (McGee); but in Kentucky those obtained near the Mississippi are larger than those a few miles to the eastward (Loughridge).

3. Epoch of the Final Retreat.

At the commencement of the Final Retreat, as shown by the position of moraine B, ice still covered all New England, all New York, and very nearly all that part of Pennsylvania that was covered at the time of maximum ice. But in Illinois and farther west to Dakota, the First Retreat had left bare a broad belt, which extended northwestward into British America west of Manitoba.

In the Final Retreat the Mississippi valley was still, compared with the east, the region of most rapid melting, and for the same reason as before — the warmer and drier climate. The series of loop-shaped moraines in Illinois and Wisconsin, and that in Iowa and Minnesota, mark the succession of halts and recessions in the course of the retreat northward from the moraine line B.

The Illinois series, as described by Chamberlin and Leverett, covers much of Illinois and passes thence into Wisconsin; and the Iowa-Minnesota series, as mapped by Upham, extends first northward and then over Minnesota northeastward, for more than 400 miles. In addition, the retreat was going on from the moraine line B in Assiniboia, north of Montana, laying bare much of Manitoba.

In the Illinois series of moraines, there is near Madison the noted Kettle moraine (KK on the map), more than 200 miles from the line B, or that of the Shelbyville moraine. But in Indiana the distance of retreat between the moraine line B and the line K, or that of the Kettle moraine, narrows rapidly; and in Ohio it is very small, the first moraine north of the moraine B being regarded by Chamberlin and Leverett as probably the moraine K. Farther east, moraine K extends along with moraine B into western New York. It has been supposed by Chamberlin to pass probably south of Cayuga and the other Finger Lakes. In view of the nearness to the line B in Ohio, it may be questioned whether it does not take the same oblique course with it through Pennsylvania and become there indistinguishable from it; and the same also farther eastward across New Jersey and south of New England. If this is the right view, New England held to its ice during all the retreat in Illinois of 200 miles, precipitation to the eastward adding about as much ice as was lost by the melting.

Subsequently the final retreat involved the Eastern States as well as the Mississippi valley, and moraines over New England and New York mark its progress. One, as described by R. S. Tarr, crosses Massachusetts west of the Connecticut, passing south of Turner's Falls, Orange, Royalston, Winchendon, and terminates in the Cape Ann moraine described by Shaler.