

when this valley was elevated above the sea and occupied by fresh-water lakes, can be indicated with considerable exactness.

The time when the Torryburn deposits began may be arrived at from the following considerations :

The raised beaches and sand flats of the Terrace period in this region, which are of Quaternary age and form the connecting link with the Torryburn deposits, contain but few mementoes of the Life of those times. The "Saxicava sands" of the St. Lawrence Valley which were formed in the Terrace epoch, and were once sand flats along the sides of that valley, are characterized by the remains of the sea shells, *Saxicava rugosa (arctica)*, and *Tellina (Macoma) groenlandica*; but in the corresponding deposit near Saint John the former of these shells is to a great extent replaced by the Common clam (*Mya arenaria*), so that it becomes a "Mya" or "Macoma" rather than a "Saxicava sand." Such deposits of the Terrace period can be traced down to the present sea level, and there are indications that they extend many fathoms below that line. From this we infer that the sea at the close of the Terrace period had withdrawn far from the present shore line and that the latest Terrace deposits are now concealed from our view, by the return of the sea to its present level along the coast. During the time when these changes of land and sea were going on, the fresh-water deposit of the Torryburn Valley was accumulating. It may be said, therefore, that the Champlain epoch had passed away and the Terrace period was considerably advanced when the first fresh-water beds were formed in the Torryburn lakes. In this part of Canada the Champlain or Leda clay was deposited in a sea which stood about 200 feet above the present sea level; and in that part of the succeeding Terrace period when the divide of the Torryburn Valley was exposed by the rising of the land, the sea had shoaled so far as to bring the land up to within 65 feet of its present level. Two important shore lines marked by terraces, had already been raised above the water when the Torryburn lakes first appeared, and two others of equal importance mark the slopes along the sea-shore, below the level of the summit of Torryburn Valley; the 65 feet level may therefore be considered as holding a middle place in the Terrace epoch, if we suppose that epoch to begin when the higher part of the Leda clay was a wash at the sea-level. But if the beginning of the Terrace period be

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\* *Macoma groenlandica*  
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