

whilst at *Chamonix* the ice near the shore of the *mer-de-glace* was found to move as follows, from June 29th to June 8th of the following year :

From June 29 to Sept. 28.....	132 feet.
“ Sept. 28 “ Dec. 28.....	70 “
“ Dec. 12 “ Feb. 17.....	76 “
“ Feb. 17 “ April 4.....	66 “
“ April 4 “ June 8.....	88 “

Total (in less than one year)..... 432 feet

This would average over five hundred feet or about one-tenth of a mile in twelve months. The rapidity in the motion of a glacier, of course, depends upon the nature of the obstacles to be surmounted, as well as to a great extent upon the time or month of the year, different portions of the same glacier moving at different rates. A glacier which descends into a valley below, or discharges itself into a sea or arm of an ocean, does not necessarily lose any of its length, for whilst its snout is being melted and carried away to warmer portions, the head or initial point is ever receiving additional snow and ice to supply it constantly, and only a subsidence of the continent could produce a change in the climate of such an ice bound district.

We have no data existing here or traces left by means of which we can calculate the rate of motion of the glaciers about Ottawa during the great ice age, suffice it to say that, as in the case of modern glaciers their rate of travelling varied at different times. Then as to the thickness of the great ice-mass which then invaded this district, that is a problem which to a great extent, has yet to be solved with us, nevertheless, let us examine the data at our disposal in reference to this interesting phenomenon. Taking the Ottawa Valley, in and around the city, as a typical example of a valley of erosion with subordinate branches, we see that facing the river and the north, there occurs a series of high “bluffs” or cliffs where the strata are clearly seen along their sides to be throughout nearly horizontal.*

That these beds could not have been deposited in such a position is beyond question, so that the prolongation of them northward must at one time have existed. What was it then, which removed all these and

*There are but few exceptions to this, due to dislocations, faults and folds in the strata, of purely local origin, but not of general significance in this problem.