

rigidity in the movement of the crust from New York to Montreal, when the sea was at the upper marine limit in the Champlain country the site of New York city must have been about 650 feet above sea level. If now the rate of depression which has brought about the change of level at New York postulated by this view be assumed to have been in the long run 2 feet a century, it will have taken 32,500 years to accomplish the change which has occurred since the sea stood at its upper limit in the St Lawrence valley. Such figures mean only that the postglacial epoch or phase for the glaciated portion of the country is to be measured, as Gilbert has stated it, by tens of thousands of years.

COMPARISON OF NORTHERN AND SOUTHERN MOUTHS OF THE HUDSON-
CHAMPLAIN DEPRESSION

The most striking differences are apparent in the recent geologic history of the lower Hudson valley and the wide open mouth of the Champlain valley. In the northern area there are abundant beaches of strong development attesting the action of powerful waves with a fetch of wind over wide sheets of water, and certainly the lower of these water levels are marine as abundant marine fossils in sands and clays from an altitude of 350 feet down to the level of Lake Champlain testify. The typical glacial topography over the plains below the marine limit is largely smothered by wave action involving cutting and filling. Where moraines or eskers exist, they are incised by the horizontal lines of wave action. More than all this the existence of a broad estuary is attested by the widespread distribution of clays bordering Lake Champlain, clays on which in the central areas remote from the old shore lines and sand deltas no newer deposits repose.

In the southern area including the vicinity of New York city and the wide valley of the Passaic and Hackensack, a relatively low area analogous to that at the northern end of Lake Champlain, recognizable wave lines have not been found, no undoubted marine beach, bar, or cliff is known to exist above the present sea level. The glacial deposits are, except in marshy and swamp areas at the surface without suffusion by clays which ought to be expected if the region had been submerged for any appreciable length of time. A diligent search conducted for certainly over