

lake beaches which latter there is reason to believe on other evidence lie within 300 feet of the upper limit of marine fossil shells.

When the beaches and bars of Lake Iroquois, a preglacial lake, are compared with the beaches of the marine district in the Champlain valley, the evidence is overwhelming that the lake beaches are much more strongly developed than those which may be ascribed to marine action in the latter field, the reason for this being that the lacustrine action continued at a given level for a greater length of time than did the marine waves. There is in short nothing in the local character of a lake beach to distinguish it from a marine beach. The geographic situation and the horizontal distribution of the beach phenomena on the other hand may furnish differentiae. Proglacial lake beaches run out against the glacier against whose front the waters are held up; in the opposite direction the beaches converge to one or more spillways whence the overflow discharged to the sea. Marine beaches and correlated shore phenomena develop about the entire periphery of an area of submergence, and phenomena of outflow are necessarily absent.

This criterion of continuity of beaches has been used in the present survey to distinguish the upper marine limit from earlier higher lacustrine shore lines which, as the evidence indicates, end abruptly as they are traced toward the Covey hill spur of the Adirondacks. In the district where these higher beaches, for which a proglacial lake origin is claimed, disappear, some phenomena demand further discussion in relation to the validity of the assumption made in this paper.

The water planes marked by deltas and beachlike deposits above 450 feet on the Mooers quadrangle, come at the international boundary to their northern limit indicating that the ice front impinged on the Covey hill spur and separated the waters on the east of the Adirondacks from those on the northwest. If it be supposed, however, that just previous to this stand of the ice the glacier had retreated, as it did later in the final liquefaction, far enough north to open free communication between the Champlain valley and the upper and lower St Lawrence (as Mr Upham has indeed supposed to have been for a time the case), then a beach or beaches would have been continuous about the spur only to be smoothed off and rearranged by the advance of the ice to the position to which the