In case the sea invaded such a valley during the ice retreat, it would control to a certain extent the deposition of washed gravels on the sides of the ice tongue but, unless the submergence were very great as compared with the depth of the valley, local embarrassments to seaward drainage would undoubtedly occur. Such embarrassments would arise where spurs entered the valley between side streams, or where the ice melted less rapidly, thus giving rise to levels of building above sea level.

Application of theory to the Hudson valley. The peculiar form of the Hudson valley, its rock benches or terraces inclosing a deep gorge, and the Highlands through which the river passes by a narrow defile with a constricted development of these benches, must have affected in a marked manner in its different sections the mode of retreat of the ice margins and consequently the distribution of the sediments laid down in the presence of the ice. First the north and south depression through the Highland section whether or not a continuous river valley as in postglacial times would have guided a strong current of ice southward and during the period of final melting would have given rise to a long tongue of ultimately stagnant ice occupying the valley north of the Highland gorge.

It is to be presumed that the barrier opposed to ice movement by the Highlands would have led in the advance, as in the retreat, to a stage when the moving ice banked up against the northwestern wall of the Highland ridges would have poured through the defile at West Point as a small valley glacier spreading out on the rock terraces below Peekskill or pushing south wholly confined within the Hudson gorge; at least in the retreat this was the case when certainly this gorge had its present general cross-section.

Wherever during the retreat the ice front crossed the river and deployed on the banks to the east and west, the streams discharging from the ice would bring down heavy loads of clay, sand and gravel, and bank them up against the ice front in the river gorge and over the neighboring rock terraces. Such deposits might originally completely fill the gorge, to be subsequently partly removed in the renewal of ordinary river drainage in the area.

When the ice had thinned so as to form a long narrow tongue filling the lower portion of the valley, covering the gorge and a considerable breadth of the rock benches on either