common in the Appalachians than during the First Retreat, water was less abundant, and the deposits, therefore, were generally much like those of more recent time.

Deposits on the Atlantic border, partly marine and estuarine, and those of similar character elsewhere, have been named the *Columbian formation.* This formation is described by McGee (1888 and later) as occurring over the coastal plain of the Atlantic slope, and ranging in height from over 100 feet in the south to 400 or more in the north. It consists of a series of sub-estuarine and submarine deltas and associated littoral deposits. The predominant and most significant phenomena are widespread stratified deposits and associated terraces, newer than the Lafayette formation of the same coastal region. Part of the deposits made during the earlier retreat also are described as Columbian. The formation, according to McGee, is in part of submarine origin.

Another result of the melting and depositions during the long retreat was the making of innumerable lakes, especially over the more level portions of the glaciated region. There were probably thousands where there are now scores — like the Tundra regions of similar origin, in Russia. The gradual action of waters during their flood seasons have converted many lines into drainage channels, while numerous others have gradually become shallowed by depositions of earth and organic materials and passed to the conditions of swamps; and the swamps have ever since been drying up.

Topographical results of abrasion by the ice and ice-made streams. — The minor effects of abrasion by glaciers are scratches, groovings, polishing of surfaces over the harder rocks; making deep channels in the softer, such as limestone and many sandstones; producing forms over the surface like the moldings in architecture, but yards in depth and width, where the architect puts inches; carving out roches moutonnées, an example of which, from the region of the Holy Cross in Colorado, is represented on page 250; but not boring out pot-holes, which requires a stationary tool.

The larger effects of direct abrasion on the softer rocks are long and wide trenches, one or more hundreds of feet deep; shallow lake-basins, like that of Mono Lake in Nevada, which, according to Russell, was excavated out of limestone to a depth of 51 feet below the existing rim, its bottom and sides being limestone; river channels; ridges elongated in the direction of the movement of the ice; steep fronts on the struck or *stoss* side of hills — the side facing the ice-stream; and long-drawn-out ridges with gentle slopes on the opposite side. Another case is that of soft rocks saved from removal by being under the lee of a ridge of harder rocks, the harder ridge making a great cavity or notch in the ice, — as near New Haven, Conn., where a ridge of weak sandstone (Sachem Ridge, on the map, page 993), a mile long and 100 to 165 feet high, was left under the lee of a trap ridge (Mill Rock), just as a tool with a notch in its cutting edge leaves a raised line on the surface of a board. The tearing and displacing work of frosts and freezing was also going on over all frosty regions, even those