in the Hudson valley. Still there are narrow tracts bordering the river bank as at Newburg where inconsiderable slips might cause much damage or loss of life. The confinement of the river within its rock gorge is a further protection to the masses of clay which remain on the borders of the river.

Landslips in a glaciated district particularly where clays are covered with gravels and sand or glacial till often simulate the irregular topography peculiar to undisturbed glacial deposits. Even the structure of glacial deposits may in some cases simulate broad landslip movements for the reason that under the pressure of overriding ice the subjacent loosely textured deposits have been disturbed in much the same way as in normal landslips; but the association of glacial features such as the indications of the former front of the ice sheet and the distribution of the deposits usually make it possible to discriminate landslip topography from glacial topography.

Contorted clays. Contorted clays have long attracted the attention of observers in the Hudson and Champlain valleys. Ebenezer Emmons[1] noted contortions in the clays at Albany and as early as 1846 referred the phenomenon to the sliding of upper beds over lower ones in the movement of the clay bank toward its unsupported edge. This explanation appears to be satisfactory for many cases in the clays laid down after the final disappearance of the ice sheet from the district. It finds confirmation in the numerous instances of the sliding of masses of clays or landslips which have been observed at one point or another along the banks of the Hudson.[2] The contortions can only indicate the beginning of a restrained movement of this nature. But there are other ways in which contortions may have arisen in this field, viz, through the advance of the ice sheet on the clays laid down about margins of the ice, and through the lateral flow of clays from the growth of superposed deltas of sands and gravels about the margin of the clay tracts, a cause of contortion in clays noted by Russell[3] in the dessicated Lake Lahontan of the Great Basin.

Contortion through the forward push of the ice along its margin is to be suspected in the case of the contorted clays in the basal portion of the section on Croton point; but the contortions can

[1] Emmons, E. 1847. *See* bibliography, 53.
[2] Dwight, W. B. 1886. *See* bibliography 45.
[3] Russell, I. C. Lakes of North America. Boston 1895. p.50, fig.7.