depositing grounds. Emerson[1] has invoked this seasonal change to account for the alternate lamination of bands of fat and lean clay in the Connecticut valley, making each layer of lean clay correspond to a summer, and each layer of fat clay to a winter.

It is difficult to see how either this or the preceding variation in clay discharge will account for the essentially even deposition of alternately coarse and fine layers of clay and particularly alternations of layers of clay with layers of fine sand over a large area of deposition far from the mouth of the discharging streams, for the fine sand would go to the bottom within a short distance of the edge of the water basin where the streams entered.

Astronomical changes. Gilbert, noting the remarkable rhythmic succession in the alternation of clays and sands in certain sediments of the West compared the phenomenon with the supposed effect of periods of minimum and maximum variations in the ellipticity of the earth's orbit, the geologic effects of which were first pointed out by Sir John Herschel. But as the period of such maxima and minima in the theory proposed by Croll correspond to entire periods of glaciation and deglaciation, it is not to be supposed that the glacial clays of a single episode of deposition manifest any control exerted by these changes and we may therefore dismiss the view as having no bearing on this group of clays.

Prodelta clays. There are several other conditions controlling or interfering with the deposition of clays, particularly in bodies of water lying within or adjacent to a retreating ice sheet. One of these conditions is inherent in the method of delta construction by which a stream swings from side to side of its delta.

For illustration the simplest case will be taken, that of a glacier discharging its drainage by a single stream into the head of a bay or lake on the border of which it has already built a delta across whose surface the stream swings in the process of discharging its load of gravel, sand and clay.

While the stream is aggrading its delta, it swings from side to side through the arc whose trace is the free margin or shore line of the deposit and whose center is the mouth of the glacial stream. Take the stream at a moment when it lies at one side (say the left) of its delta contiguous to the ice front. Its burden

[1] Emerson, B. K. Geology of Old Hampshire County, Mass. U. S. Geol. Sur. Monogr. 29. 1898. p.706–7.