two hundred feet off, and to repair which it cost one hundred and forty thousand dollars.

Now, in explanation of these fissures, Pennsylvania, not being subject to volcanic action, or the seismic workings of earthquakes, the writer suggests that the fissures brought to light had, theretofore, existed and been filled in with earthy, sandy, or clayey material, which under the superincumbent pressure or action of the water, were, within the delay mentioned, washed out, thus allowing the water to percolate through them, and crop out as it did at a distance from the site of the reservoir, and the settling of the embankment ; and the washing out of the clay from in under the brick lining can be due to nothing else than percolation of this clay by the water through said fissures to the outcrop at a distance ; showing that any such fissures should be looked for in advance by denuding the surface, cleaning out the fissures of their clayey material and filling the interstices with concrete.

Case No. 28, in October, 1894, at the Queen Lane reservoir, Philadelphia, is thus stated : When filled to ten feet deep, many leaks occurred. The bottom was lined with four inch concrete on two feet thick of puddled clay put in in layers, rolled and watered. The underlying rock was gneiss and mica, of which the upper portion was more or less disintegrated. The cost of reconstructing interior lining and foundation was two hundred and seventy-five thousand dollars.

It is probable again in this case, the writer suggests, that had the surface been thoroughly examined and all soft and spongy places picked out, of material honey-comed by worms or other burrowers or dissolved out by surface water or swollen out by the action of frost, and the voids properly filled in with concrete and rammed down, or with solid clay, before the bottom or puddle of concrete was put in and settlement thus avoided, this expense of repairing would not have had to be incurred.

The next case is that of a wooden dam, holding seventeen feet depth of water, at Tacoma, Wash., and which failed from being undermined.

No. 30 was a stone dam, forty feet high, eight feet thick at top, and twenty-five feet at bottom. This, according to the writer's views, was too thin, the thickness being five-eighths only of the height, instead of equal or nearly equal thereto, which it should have been. In January, 1869, while under construction, a freshet carried away one hundred and sixty feet of it, and scoured out a