

This statement covers some forty-nine cases of failure during the last thirty years or thereabouts, almost every one of which was reported at the time of occurrence in the "Record," and by Mr. Hill credited to that paper.

The first case was an earthen dam, some twenty feet high, fifty feet broad at base and twenty feet at top, at Middlefield, which, in April, 1901, was destroyed by an overflow; though, on account of its having a double core or walls or partitions in it of sheet-piling, with rip rap faces on the up and down slopes, it could not be seen how such a thing could happen.

This would have been abundant to stand the pressure due to depth of water; nor did the dam fail either by percolation through it, much less by being moved bodily forward.

It was destroyed by overflow, and it could not be well seen how the overflow had brought about the result, on account of the two walls of sheet-piling within the dam and reaching to the top of it or nearly so. The writer of this memoir satisfactorily explained, as published in the "Record," at the time, that the over-rushing water had first worn and carried away the outer or lower section of earthwork with its rip-rap.

When this was gone, the outer partition or wall of sheet-piling, only a few inches thick, being unsupported, leaned forward and broke or fell over. The outflow or scour then took hold of the fifteen feet of earthwork intervening between the fallen row of sheet-piling and that remaining; washed this away, causing the other, or inner wall, or wooden partition or bulk head, to follow the first, and finally, the upper third, or inner section of the embankment to go with the remainder.

This is quite an instructive case of failure, and, which could not have happened otherwise than by an overflow, the dam being impermeable, due to the sheet-piling or double core, it contained, and immovable on account of its weight.

In the next two cases cited by Mr. Hill, and which occurred, the first at Victor, Cal., in May, 1901, and the other at Lebanon, Ohio, in July, 1882, the dam in each case being of earthwork, without either core or protecting walls, and the heights respectively twenty-five and thirty feet, the destruction occurred by overflow or erosion; an inadequate spill-way obtaining in the first case, and no spill-way at all in the second.

Case No. 4 is one where the spill-way itself was washed out, the