cavity twenty feet deep in the river bed. The cavity was filled with loose rock, and a timber apron, filled with concrete placed upon it. Twenty-two years afterwards, or in 1891, two hundred and fifty feet of the dam were carried away by the undermining of the loose rock under the apron.

A clay dam with no core to it, at Dallas, Texas, twenty-nine feet high, failed, it is supposed by the running away of quicksand from beneath it, which caused it to settle, emphasizing again the necessity of investigating the nature of the foundation to a solid rock or unyielding bottom.

A masonry dam at Calaveras, Cal., thirty-five feet high, was carried away in 1895, supposed to be due to undermining, as an excavation was being made along its upper face to remove a cotton tree stump of which the roots extended under the wall; but it is just as likely, the writer thinks, that it failed, due to want of proper weight to resist the water pressure, its thickness at bottom, being only two-thirds the height and reduced, thereafter or higher up to a thickness of thirteen feet, or less than half of the remaining height.

Case 33 is the Mill River reservoir dam at Wiliamsburgh, Mass. It was of earth, six hundred feet long and forty-three feet high. It is stated to have been undermined by its core wall not extending down as it should have done to a solid and impermeable bottom.

These are all extremely instructive and interesting cases.

The next case is that of a dividing wall of a reservoir, at Little Rock, Arkansas. This wall of masonry, thirty-six feet high was but twelve and a half feet thick at base and seven feet at top, with seven million gallons of water at each side of it. Now, when the water was drawn off from one side of it for repairs or cleaning purposes, it is evident it had the same pressure to bear as a dam wall proper, and as its thickness at base was but one-third the height, it must have been evident in advance that it would give way the moment one side of the reservoir were emptied.

Following on, we have an earth dam of fifteen feet high and twenty-eight feet base, with a dry bowlder lining on down side, of which the failure is ascribed to faulty construction.

No. 36 is a dam at Vernon Heights, Oakland, Cal. It was but eight feet high, but though built of asphalt concrete, it being but two feet thick at bottom and one foot at top, it evidently could not