

The dam by Sir Benjamin Baker, across the Nile, at Assouan, some six hundred miles above Cairo, in Egypt, also thoroughly sanctions the idea that to be on the safe side, in view of the possible destruction or disintegration hereafter of the binding material, leaving nothing but the weight of structure to resist that of impounded water, the dam should be twice the weight equivalent to any pressure of water, so that the friction of stone upon stone or the force to be exerted in overcoming such friction, being 0.5 of its weight, water being only a little less than one-half the weight of masonry, one may be on the safe side in making the dam at least twice the weight of the water impounded.

At the Quaker dam a spill-way is provided, and where a dam has only the watershed behind it of a mere island as Manhattan, there never can be such a danger of overflow as at Austin (or elsewhere), where a large portion of a continent may bring in its contingent now and then, and where the overthrow of the dam might possibly have been guarded against by such a system of flood gates as Baker has provided at Assouan, not only for irrigation purposes during drought, but to prevent the eventuality of such an overflow as that which, at Austin, carried away the very dam itself.

Enough has now been said to put engineers on their guard in relation to dam failures, forty-eight cases of which are here given as having happened in the United States alone and only during the last twenty-nine years.

Mr. Hill adds that some forty-eight other failures of dams and reservoirs are known to him, and that it is very unfortunate that the records relating to them do not contain any description of the structures, the purpose of their construction or their cause of failure.

We have, fortunately, few cases to register for Canada, that of Chambly being one in point, and one at Chicoutimi, which the writer reported on at the time (now some two years ago), was due to a leakage at base of dam and around the western extremity thereof, where the dam abutted directly against an earth embankment, while at the eastern end, it rested against solid rock.

In this case, water having, under the head pressure from within the dam, forced its way by percolation through the soft material of the cliff against which the western end of the dam reposed, the aperture was, of course, speedily worn away by erosion, to the size of a sewer, and then of a culvert, then to that of a tunnel, when