

riding the head of water, and from the greater time required for managing the double set of fixtures, for emptying and filling the lock. And 2d.—If, as a large trade would often require, it should be necessary to raise and lower a boat in each of the *twin* locks, at the same time, then, unless their movements were like clock work, it would almost always inevitably happen, that one or the other of the boats would be compelled to wait considerably longer than if her progress depended upon her own movements singly.

We close the subject by saying, we feel confident that no canal Engineer, would take the responsibility of constructing twin double locks on a canal, like the Seneca cross-cut, unless they had been previously found to answer the purpose intended on some other work.

Now we, relying upon no such expedient, and in view of all circumstances, have taken $1\frac{3}{4}$ locks full for each boat passing the summit—and we think from experience elsewhere, and from the personal observations of one of us, while superintending a canal in use, that ours is a minimum estimate for a summit like the Seneca—when irregularities will be continually occurring, by which some one or other of the short levels, will be drawn down below its level, which must consequently be again filled from the summit.

We will here quote some remarks from the New York commissioners, upon the expenditure of water, particularly upon a canal with numerous locks and short levels. (See their report of January, 1834, pages 33–34 and 35.) “The quantity of water necessary to supply the waste from leakage, filtration and evaporation, is raised by circumstances, and it is difficult to apply the experience derived from one canal to another, with certainty. The nature of the soil, the manner in which the work is constructed, *and the number of locks on any given distance, are prominent causes of waste,*” &c &c.

Again.—“The quantity of water passing in the Erie canal, has been gauged at several places and at sundry times,” &c.

“The commissioners are inclined to the opinion, that with proper care in guarding against the waste of water, 100 cubic feet per minute per mile, for leakage, filtration and evaporation, would be a safe estimate for the western and middle sections of the Erie canal; but it is believed, that it would be found, on a careful examination, that a much greater quantity would be necessary on many parts of the eastern section, where the soil is more open, the *levels shorter, and the locks more frequent.*” The commissioners, it should be recollected, are here speaking of the *present* Erie canal, which has a depth of only 4 feet.

The commissioners proceed, with more particular reference to the Chenango canal. “On a canal, *where the levels are short, and the locks frequent, the supply of water for leakage, filtration and evaporation, will be greater than where this is otherwise, and this waste will increase as the locks grow older.* The large and small gates of locks