

48 feet canal, perform the same work as 130 horses on the 40 feet canal; and, with the same towing power, the weight transported on the 48 feet canal, will be to the weight transported on the 40 feet canal, as 130 to 100.

But the depth of the 48 feet canal being one foot greater than the depth of the other, let us examine what will be the comparative resistance of the boat being immersed 4 feet into the 48 feet canal, and but 3 feet into the other. We find, in this case, the ratio to be 1.47 to 1.58, or 100 to 107; and we infer from it that, with a gain of about seven per cent. of towing power, the weight transported on the 48 feet canal will be one-third greater than the weight transported, during the same time, on the 40 feet canal.

The foregoing considerations show, that, in determining the transverse section of a canal of great length, and with a dividing summit level, the amount of lockage, must have a due influence upon the breadth and depth of the water section. And, indeed, taking into view the great distance and considerable lockage belonging to the present case, a cross section, larger than that recommended, might have been suggested, had not a regard to economy, and to a competent supply of water during the dry season, forbidden it.

However, the transverse section, as just proposed, may be deemed sufficient to fulfil, in a satisfactory manner, the main requisite for which it has been intended. And, in order to remove all doubt, let us compare, as to amount of transportation, the contemplated Chesapeake and Ohio Canal, with another of the same length, but whose lockage would be 600 feet only, with a transverse section of 40 feet at the surface, and 4 feet in depth.

The rate of travelling being supposed, for both, $2\frac{1}{2}$ miles per hour, and one minute allowed for each foot of lockage, 60 feet will be, as to time, equivalent to $2\frac{1}{2}$ miles, and these canals will then compare as follows:

The Chesapeake and Ohio Canal, having 3158 feet of lockage, in a distance of $341\frac{2}{3}$ miles, is equivalent, as to time, to a single level canal of 473 miles, which would require 189 hours to be travelled from one end to the other.

The 40 feet canal, having 600 feet of lockage in a distance of $341\frac{2}{3}$ miles, is equivalent, as to time, to a single level canal of 367 miles, and which would be travelled in 186 hours, from one end to the other. But it has been shown that, on the first canal, the amount of transportation being expressed by 130, it will be 100 on the 40 feet