

Then, as one of the locks of the enlarged canal of fourteen feet lift will require 172,800 cubic feet of water for a single lockage, the effect of taking a lock full of water out of this reach, which Mr. Page calls "a basin of itself," will be to lower the surface sixteen inches.

Navigators may not like the prospect of grounding their vessels upon a rock bottom, or of sticking upon the mitre-sills and so to assure them there is no danger of either, the Chief Engineer declares that such calculations as these "are worthless," because, with Lake Erie at his back, he can send down such a volume of water through the enlarged canal as will always keep it up to high-water mark, even when the locks are worked to their utmost capacity.

Here it is necessary at once to draw attention to the fact that Mr. Page suddenly changes front, and adopts a line of argument in defence of this basinless reach which, carried to its logical sequence, would prove all basins to be superfluous. If he can so readily dispense with one basin, he can just as well dispense with two, or three, or all of the basins which, on the other portions of the canal, he has gone to so great expense to construct. But because he cannot have a basin here, he, in the most illogical, and unwarrantable manner, assumes it to be unnecessary.

The fallacy of this argument must be apparent to any one practically acquainted with the working of the old canal. A prudent engineer should endeavour to economize the water by arranging his works so as to avoid waste, but here, from the outset, in order to compensate for defective construction, it is proposed in clause 59 to work the canal at high pressure, by wasting "a volume of water from three to six times greater than that required for lockage purposes."

In a previous report of the 27th February, 1872, to be found in the Public Works Report of 1873, the Chief Engineer, when putting to a test the calculations made by Mr. Brunel for supplying the canal by steam power from Lake Erie, showed that the quantity of water actually passing through the canal, was from nearly three to nearly seven times as much as had been theoretically assumed as necessary.

Balancing these two statements, one against the other, we are likely to find the enlarged canal, when opened, in the same unsatisfactory condition as the old one, in which, for years past, the want of water for the mills, and even at times for the navigation, has been such as to lead to seriously proposing to supply the canal by pumping from Lake Erie.

#### THE WELLAND RAILWAY

is a short line, 25 miles long, running from Port Colborne to Port Dalhousie, along the east side of the canal. It was built as a portage railway between the two lakes to lighten vessels passing through the Welland Canal. It is now leased to the Great Western Railway, and that part of it between Allanburgh and the Welland junction is at present used in connection with the Air Line. The new line of canal must necessarily cross this railway somewhere either north or south of Thorold. If it crosses to the north the drawbridge must be on the steep gradient of eighty-three feet in a mile. If to the south, the bridge will be on the level part of the line, which for the interest of the railway is to be preferred; but on this line the canal cannot be furnished with suitable basins, and hence the public interest is opposed to it. On the other hand, the proposed line through Thorold, which gives ample basins on every reach, leads to the northern crossing of the railway on its maximum gradient, and this crossing is objected to by Mr. Page, who states that a drawbridge in this position would render the railway "practically useless," and involve "the destruction of a great public highway." Evidently in his judgment such a crossing of the railway presents an insurmountable difficulty.