

uppermost point for a distance of about 50 yards is 7 miles per hour in 3 feet water, at 20 feet from shore. At the middle point opposite station 21 for about a like distance the velocity of the current is 11 miles per hour in 3 feet water, at 20 feet from shore. But at the lower point opposite station 20, and to the upper part of the same point, the velocity at 20 feet from shore in 4 to 6 feet water varies from 11 miles at the upper part to 14 miles per hour at the lower part of the point, which distance is about 200 yards. The bank is very high at all three of these points; it rises almost perpendicularly up from the water edge 5 to 6 feet deep of stony primitive earth with 10 feet clay above it, and from the steepness of the banks, the crookedness of the shore, and the violence of the currents, the whole three points taken together form one of the principal obstructions to the navigation of this part of the river in either batteaux or durham boats, and one to overcome which the greatest power in men or horses is required, and the greatest expense is incurred. To make such an improvement as to obviate the difficulties and danger that present themselves at this point, and one that will be at once permanent, safe and convenient, an inland cut has been projected, from the still water in the Bay above station 22, following a valley which seems to have been an ancient branch channel for the water of this river, to a little bay near station 19, in which there is 3 feet water on a bottom of clay and small stone close up to the shore, in which boats from the offing can conveniently come in their ascent, and the depth of water in which will be considerably increased by the introduction of a strong current by means of a sluice cut through this valley from the superior level in the bay above station 22. In order to give to this cut sufficient breadth for Durham boats when ascending through it to use their setting poles on both sides without injuring the bank, it is proposed to excavate it 18 feet wide at bottom, in conformity to the cuts before mentioned, deep enough for boats carrying 25 tons as above mentioned, by giving 30 inches depth of water, and to construct a tow path in the bank on the land side of the cut of 80 feet wide; and this, 4 feet above the surface of the summer water so that its surface shall not be corroded by the spring freshets passing over it, and to give the banks the slope shewn upon the transversal section No. 1. on the plan. This condition being necessary to provide against the natural propensity of earth to press inwards in such cases.

The mean velocity of the current round the *Pointe du Moulin* comprehending the three points, is 11. The velocity the same difference of inclination would give on a plane extending 2.5 more in distance which is the ratio between the sum of the distances in which the rapids occur at this place; and the length of the proposed cut on an inclined plane is 6.6-10. The current therefore in the sluice would run at the rate of 6.6-10 miles per hour, instead of full 14 which it now runs for a considerable part of the distance round the lower point near station 20, making a vast difference in the power necessary to overcome the existing impediment, besides the degree of safety which attaches itself to this mode of improvement.

Boats are frequently detained whole days, and it is known, that they have remained several days at the foot of the Rapid, at this point, before they could find means to surmount the difficulties that here present themselves. That some considerable improvement and amelioration is necessary in this situation, therefore, is quite obvious, and no plan appears to afford so good a prospect of success in fulfilling the conditions required; as the one proposed above; see Profile and section No. 1.

From *Pointe du Moulin* or rather the Bay above station, 22 up to the *Pointe* at station 23, about 250 yards, there is no current, the water is deep enough for our purpose at a moderate distance from the shore the bottom is clay, there is no beach, the bank is steep, and the public road is at the very edge of it; there is therefore no necessity for a tow path, nor could one be constructed in this distance, without injuring or entirely destroying the present high-way.

*Tower's Point*—At this place and for 800 yards farther up, the water is very shallow both near in and far out from shore, and from