and two and a half feet deep on the surface of the meadows. If the bottom of the river, from the point one hundred and ten yards above the bridge where the water was eight and a half feet deep, could be made to have a fall sufficient to give the water a velocity of at least one and a half feet per second, its surface would be kept five feet lower than it is possible to keep it with the present reef at and below the bridge. If this had been the bottom on April 14th, the water surface, being five feet lower, would at that time have been two and a half feet below the banks.

By applying the "New Formula" used by Captain Humphrey and Lieutenant Abbott in their investigations on the Mississippi, we find that, in a stream the size of the Pequest on April 14th, a fall of one foot per mile would give it the above mentioned velocity of one and a half feet per second.

The grade line on the profile represents this new bed from the bottom of the river one hundred and ten yards above the Steam-mill Bridge, down towards first bench, with a fall of one foot per mile. It will be seen that at the Steam-mill Bridge the grade is eight and three-tenths feet above the datum plane and five and a half feet below the bed of the river, which is rock. At the first bridge above Vienna, the grade is four and three-tenths feet below the present bed of the channel—the latter rock—and continues from two to five feet below the bed of the river for three hundred yards. Just below Vienna Bridge is another reef three feet above the grade. Between Steam-mill Bridge and the first bridge above Vienna, there is considerable loose earth and some rocks, besides the three reefs, varying from one to three feet deep to the grade line.

It will be seen that the grade does not run below the bed of the channel between Vienna Bridge and first bench, while it reaches the latter five feet above the datum plane, or one