

making large canals or cuts, capable of carrying such quantities of water as may be sufficient for the purposes of navigation and also for such water-works as aforesaid.' The first condition upon which an application of water may be made to mills, as well as to navigation, is the consent of the proprietors. But, supposing that to be given, still, there are other conditions of the most grave importance, which must all be complied with, before any water can be taken from these canals for mills. The company are empowered and directed to do so, 'if it can be conveniently done to answer both purposes.' This allows to them an extent of discretion, which cannot be duly appreciated without adverting to the consequences of making a navigable canal tributary to mills as their head race.

The application of water as the propelling power of mills, requires that it should flow in currents, no matter how rapid, so it does not inundate the position of the mill; but the perfection of a navigable canal is, that the water it contains should be entirely motionless. The one use requires quick motion, and the other stillness. Hence the unlimited application of the same volume of water; or rather the having of water conducted along a cavity to answer both purposes is absolutely and directly incompatible. (q)

To illustrate this, we must again recur to the diagram. Let A D be the navigable canal twenty-five feet wide, and two feet deep, made tributary to mill-sites as a head race. Suppose the whole line from A to D, affords sites for mills; and that, within that space, there is room for the erection of forty mills; then suppose that the dimensions of the canal constructed, be 'capable of carrying such quantities of water as may be sufficient' for twenty mills only. It follows, that one-half of the mill-sites cannot be occupied; and that the other half must totally annihilate the navigation. But, if the draft from the canal for mills be of such a volume as to give a rapid motion to the waters, the navigation, in one way at least,

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(q) 'One great and fatal error has been interwoven into the scheme of the other canals, excepting only that of the Potomac. They have been dug as much with a view to the erection of mills, as to the purposes of navigation. To fit them for mill-races, their descent is rapid, and their current strong. They are liable, of course, to the variation of the quantity of water in the river; they bring down with their current, the alluvium of the river; bars are formed in them, as well by this alluvium, as by the land wash; and their banks, where they are not of rock, or walled, are liable to perpetual wear by the current. The canal is, besides, itself an inconvenient rapid to those who would ascend it.'—Per Latrobe, Report of A. Gallatin, Secretary of the Treasury, on Roads and Canals, 1808, page 86.