

ment I shall probably get myself into trouble, but Mr. Van Law's experience will bear me out.

Under the right conditions, material can be transported in a pipe. On a grade, we could not possibly transport it in an open launder, but the initial grade should be greater than the grade at the end (the sooner to develop pressure) which in an open launder would be bad practice. But, as a rule, we can only utilize a pipe on very fine material, and when handling comparatively large quantities. To make myself clear, if we attempt to transport in a pipe $\frac{1}{2}$ -in. material at the rate of 10 lb. per min. on a certain grade, with the least quantity of water, the theoretical size of pipe required would be so small that in a short time the pipe would clog, but to transport 100-mesh material through the same pipe would be easy. I know full well that pipes used in mills in place of launders, often give much trouble and it is not my purpose to recommend pipe in place of launders, except for carrying off great quantities of comparatively fine tailing. There is more to Mr. Van Law's expression, which I will quote, than most of us (probably even himself included) would think. "As soon as riffles of sand are formed so as to cause an obstruction in the flow, the pipe develops hydrostatic head above the point of obstruction sufficient to force the sand through." That is, if the pipe is too large to give the velocity of water that will keep the material in suspension (or carry it on the grade used) then nature itself, by the filling in of sand, reduces the size of the pipe down to the point where the velocity will be high enough to carry the material off, depositing it ahead again where velocity is slower, until this point in turn reaches the carrying stage, and so on. This action also shows to some extent in a launder, but the effect is not the same as in a pipe, because the launder can keep on filling up and water still flows on top, without increasing its velocity at that point. The carrying of tailing in a pipe and in a launder are two entirely different problems, and do not at all follow the same laws. In the pipe we depend mostly on the head developed, but in the launder on the rolling and sliding action down an inclined plane, except in the case of exceedingly fine material, where the hydraulic condition or wetted perimeter approximates the right proportion of a launder. I hope in another year to finish my investigation in regard to the problem of launder capacity and to present it in much better form than these ramblings.

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G. A. OVERSTROM.