

maintaining therein the natural conditions of the water, and in order that the interior may easily be inspected and any foreign matter removed.

"5. A fishway in all its parts should, by the action of the current of water passing through it, be as nearly as possible, self-cleaning of all sand, gravel, mud, and rubbish.

"6. The water supply of a fishway should be ample and the same, or nearly so, at both ordinary high and low water stages, avoiding thereby any regulating gates or other devices calling for the services of an attendant.

"7. The top and sides of a fishway should be above ordinary high water.

"8. The fishway should be built very strong and be well protected against the destructive effects of freshets, drift logs, ice, etc.

"9. The intake and outlet should be well submerged and the former protected against floating debris, etc., by a suitable grating.

"The location of a fishway must be such that ascending fish will not be alarmed and driven off by disturbance from boats, fishermen, etc.

"The material of fishways may be wood, stone, concrete, or iron, depending upon the construction of the dam, its size, the topography and nature of the site, the labour and material at hand, and the funds available."*

It is not the intention here to discuss the merits of various fishways, but it is desired most emphatically to point out that great difficulty will be experienced in providing and maintaining satisfactory fishways in power dams of considerable height, say above 25 or 30 feet.

The United States Bureau of Fisheries is alive to the fact that the fisheries of the country have suffered by reason of inadequate provision being made for the fish to overcome obstructions in streams. With commendable enterprise the Bureau had commenced an extensive investigation involving observations and experiments to determine the efficiency of all fishways now in use. The research, owing to present exigencies, has been temporarily suspended.

The Bureau appears to have accepted as a basic doctrine, where matters of advantage or disadvantage are being considered in connection with dams and the construction and maintenance of fishways, that any benefit of doubt should properly be given to the fish; and,

* Consult *Fishways*, by H. Von Bayer, C.E., a paper presented before the Fourth International Fishways Congress, held at Washington, U.S.A., Sept. 22-26, 1908.