

111.—ANTON PINTSCH'S MOVABLE FISH-WAY.***By Dr. M. NOWICKI.**

At Kurezyn, on the river Poprad, in Hungary, there is a high weir which prevents the salmon getting up to the spawning ground, and has caused a falling off in the number of salmon.

It was therefore decided, in connection with the attempt which was being made at the time to increase the salmon in the Weichsel district, to open up the Poprad River again to salmon. Count William Migazzy, president of the Upper Hungarian Fisheries Society, and to whom the improvement in Hungarian fisheries owes so much, took steps to provide the weir with a salmon ladder at his own expense.

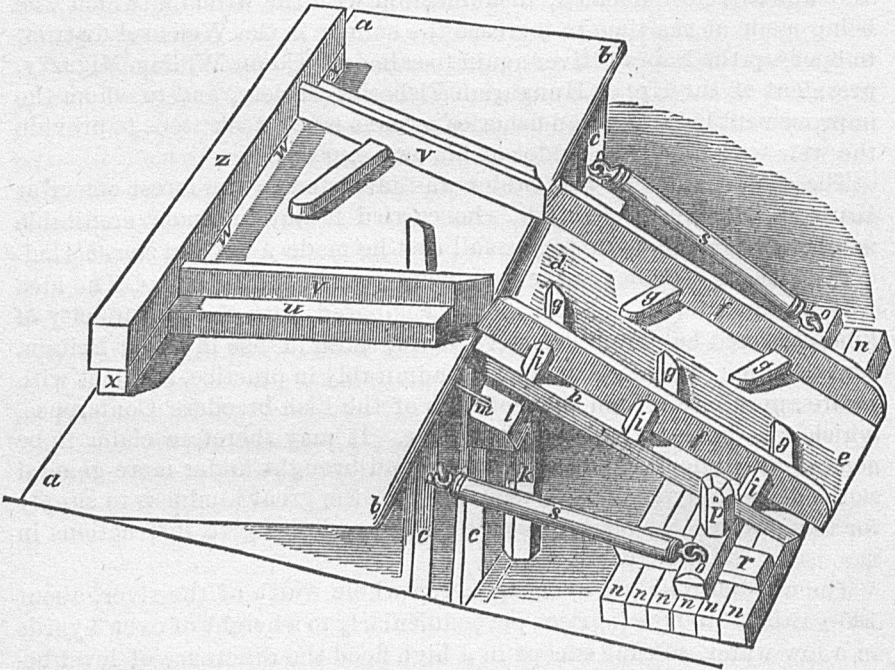
The construction of the ladder was intrusted to the forest officer at Kurezyn, Mr. Anton Pintsch, who carried it out in a most creditable manner, inasmuch as at very small cost he made a wooden *movable* ladder, which he attaches to the weir every year in the autumn. The idea was, at any rate, an original one as compared with the multiplicity of kinds of fixed ladders of massive build, those in use in Great Britain, for example. This ladder answers admirably in practice, and met with entire approbation from the members of the Fish-breeders' Conference, which was held at Dresden last year. It may therefore claim to be somewhat particularly described here and brought under more general notice, especially as Mr. Pintsch has had the great kindness to supply for this purpose the accompanying design and also give instructions in the use of the ladder.

The wooden weir (*a b c*) occupies the whole width of the river, about 125 yards. Its face (*c*) rises perpendicularly to a height of over 3 yards in a low water, so that except in a high flood the difference of level between the water below the dam and that above is too great for salmon to overcome, and for just this reason the use of a ladder is imperative. The broad dam head (*a b*), with gentle slope, is boarded horizontally; its ridge (*a*) is horizontal lengthways, and without crown. Below the dam are several deep pools, in which the salmon lie, and it is over one of these just below the weir that the fish pass is placed.

The ladder (*d e*) has parallel sides (*f*), and a level bottom (*d e*) is made of strong $2\frac{1}{4}$ -inch planks, 16 feet 4 inches long, 3 feet 6 inches wide. The blocks (*g*) are placed widely apart to allow room for large salmon to move about between them easily. The height of these blocks corresponds with the depth of water required for salmon, and the fall is that of the

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floor of the ladder. The ladder rests on strong beams (*h*), and is kept in its place by several small posts (*i*), which are let into the beams. Its upper end is supported by the wood-work (*kl*), and the lower by the float or platform (*n*). The wood-work (*kl*), close to the front of the dam (*c*), is lower than the dam edge, and consists of the two piles (*k*) and the supporting beam (*l*) mortised on to them. The beam is fastened to weir by strong iron clamps (*m*, 1 inch square), which go through it, and are secured by nuts or screw ends underneath. On this support (*l*) the upper end of the ladder rests free, so that its floor is level with the top of the weir, and just touching it, while the sides of the ladder are higher, so that the water can flow down between them. The ends of the sides



Anton Pintsch's movable fishway.

(*f, f*), where they meet the ends of the guides (*v, v*), are cut at angles (see illustration) to permit of the ladder working in its place, as the platform rises or falls. The small space between the ladder (*d*) and the edge of the dam (*b*) can be covered by a board nailed to the dam, if it was necessary to prevent any water falling through.

The platform (*n*) floats on the surface of the water, and is held fast by the two bars (*s, s*) which are fastened to hooks in the weir and platform. The platform is formed of several 8-inch to 9-inch logs of well-seasoned wood (*n*). These are fastened together by the stout piece (*r*), on which rests the cross-beam (*o*), the ladder being kept in place by nails in the supports (*p*), which act as axles on which it works. The

end of the ladder (*e*) projects beyond the platform, and touches the surface of the pool, or dips into it a little, according to the amount of water flowing over the ladder. It will be seen that as the water rises or falls the platform rises or falls with it. In a small water the platform rests motionless; but in a heavy water, forming waves under the weir, it shakes.

The converging guards (*v, v*) are for the purpose of directing the water which comes in at *w*, under the beam *z*, upon the ladder. They are about 12 inches in height, and provided with two blocks, like those in the ladder (*g*), to break the force of the water, and enable the fish to get over. The object of the beam (*z*) is to control the amount of water passing into the ladder at *w* (the height of this opening being only about $6\frac{1}{2}$ inches), and prevent too much water flowing over. In spring and summer high waters prevail in the Poprad, enabling the salmon to get over the high dam; but in autumn there is generally a low water, and the ladder is necessary in September, October, and November.

A flood does not injure the ladder at all, but the winter's ice would tear it away; so, as it is easily taken down, it is then taken away and put so that the platform gets dried well by the sun. The wood-work (*kl*) is left in its place, as being out of danger from ice.

The construction of the ladder, including wood, iron, and labor, costs only \$15 at Kurczyn, and the cost of removal and replacing, with any necessary repairs, about \$3 or \$3.50. The ladder has only been used two autumns, and Mr. Pintsch has often had opportunities of seeing salmon ascending it without difficulty. Before it was put up he had frequently noticed numbers of salmon collected in the pools below the dam, and making vain efforts to get over it, and at last getting caught by the fishermen. But since the ladder has been in use the salmon are rarely seen waiting in this way, as it enables them to get up at once. Models of this ladder are in possession of the Galician Fisheries Society, the Austrian Fisheries Society in Vienna, and the German Fisheries Society in Berlin, and drawings of it have been sent to England and America. As a movable and cheap salmon ladder it seems preferable to the costly fixed affairs. With the necessary modifications required by different conditions in dams and rivers, it offers exceptional advantages, especially where expense is a consideration, and there is not much water to play with. These are my reasons for recommending it.

CRACOW, April 27, 1884.

REMARKS ON PINTSCH'S FISH-WAY BY BRÜSSOW.

The question of movable salmon-ways has been discussed among fish-culturists for some time, and the problem seems to have been solved in a very simple and happy manner by the above-mentioned invention; only it will be necessary—

(1.) To weight the platform or raft *n n* with some stones, so it may

sink deeper into the water, and that the foot of the ladder may contain more water;

(2.) To increase the height of the opening w , which is only 16 centimeters, to 25 centimeters, because otherwise a large salmon cannot slip through below; and

(3.) To place the diverging walls on the weir $v v$ somewhat wider apart at the upper end, or, in other words, to make the opening $w w$ somewhat longer, so as to get more water into the ladder and make it easier for the fish to ascend.

NOTE ON PINTSCH'S MOVABLE SALMON LADDER, BY R. B. MARSTON.

In a recent account of salmon fishing in Scotland, I referred to the dams on the river Don in Aberdeenshire as preventing the ascent of salmon, except in high waters. Being of opinion that there is often not much good done by merely describing a disease unless you can also suggest a remedy, I said if any of my Aberdeenshire readers desired it I would give some account of the McDonald fish-way. Several gentlemen asked me to do so. Now the only objection that I could think of as likely to be raised against the McDonald pass was its expense, which would probably be very high. But in the German *Fischerei-Zeitung* of April 22, I find an account of a movable ladder invented by Anton Pintsch, forest-officer of Kureczyn, in Hungary. This ladder is fully described in the German Gazette by Dr. M. Nowicki, of Cracow, and it seems to me to be in every way well worthy of trial in this country.

It seems to me that we are much indebted to Mr. Pintsch for inventing, and Dr. Nowicki for describing, such a very practical and extremely cheap salmon ladder. It can hardly fail to succeed if used on such rivers as the Don in Aberdeenshire, at the horrible weir at Armathwaite on the Eden, at Totnes weir on the Dart, and other similar places where, except in heavy waters, salmon cannot pass up-stream.

FISHING GAZETTE, *May 24, 1884.*

112.—TRANSFERRING CATFISH FROM THE POTOMAC TO THE COLORADO RIVER, ARIZONA.

By MARSHALL McDONALD.

One hundred catfish were sent to Arizona with the recent shipment of 1,000,000 shad for the Colorado River. Of these 10 reached destination and were delivered to Commissioner Gosper, at Prescott, Arizona, who will deposit them in the Colorado River.

UNITED STATES FISH COMMISSION,

Division of Distribution, June 28, 1884.