

THE DISAPPEARING BEAVER.

ELLIOT R. DOWNING.

In a bulletin of the State Biological Survey on the Mammals of Champaign County, the statement was made that in the early days the beaver was an inhabitant of Illinois. Now, there probably are none of the animals left within the state. It has been my good fortune to follow it in its retreat to regions where it still is abundant. The book that is still the American classic on the beaver was written by Morgan, who made most of his observations upon the beaver in northern Michigan. I lived as a boy in the neighborhood of the streams where he saw these animals and have recently had the chance to watch them at work in this same region. My early interest was one of curiosity merely; my later purpose in studying the work of the animal, to see in how far the skill which he displays is a result of instinct and how far it is a matter of intelligence. No other animal leaves such extensive workings and hence the beaver is an exceedingly good subject for the study of animal behavior, since the record of his work is easily read and relatively permanent.

Permit me to give a brief resume of the life habits of the animal as observed in northern Michigan. In the deeper streams where the banks are steep, the beaver does not build the dam, but excavates a burrow in the bank. There are many colonies of these bank beavers in the Upper Peninsula streams. Usually, however, especially on the smaller

streams, the beaver-dams are conspicuous objects. The dams are built of tag-alder principally, with poplar and birch. The tag-alder is an almost constant border tree along the streams. I have seldom seen any indication that its bark is used for food, but it is extensively cut to form the dams. These dams are usually rather loose structures, the chinks of which are filled in by floating debris that is entangled in the brush cut and piled by the beavers. Many of the dams have the appearance of being constructed by the accumulation of the stripped poles and logs that have floated down from the beaver pond and lodged in the pile of alder brush which initiates the dam. The dams usually bend down stream and will vary from a few yards in length to many hundred feet. The long dam in the accompanying map was 256 feet in length. Morgan records dams three times this length. The dam varies in height from a few inches to several feet. I recall one dam on the branch of the Huron River that was something over 300 feet long and some 12 feet high at its highest point. In the beaver pond the houses are built and near the house in the fall there is accumulated a pile of brush made up ordinarily of poplar branches,—that is the store of food for winter.

Beavers are vegetarians and feed on bark and tender twigs of the poplar, occasionally on birch and other trees, but the poplar is the staple article of food. *Populus tremuloides* and *grandidentata* are the common forms in northern Michigan. Succulent roots and tender shoots of many of the plants growing along and in the streams are also eaten during the spring and summer. In the fall, most activity is seen in the beaver colony, for then the dam and houses are repaired and the winter stores accumulated. The poplar trees are cut while the beaver sits upon its haunches, supported in part by the tail, and the stump is usually from 16 inches to 20 inches in height. Poplars from 4 inches to 6 inches in diameter seem to be the favorites, but much larger trees are cut down up to 18 inches. Larger cuttings are reported, but I have never observed them in the northern woods. The branches are trimmed off the trees, the trunks cut into convenient lengths, three feet to six feet long and the branches and logs are transported to the pond to be piled in the heap of winter food. Not infrequently one finds a stump showing one cutting running halfway through it, which had evidently been abandoned by a beaver, then a second beaver has finished cutting down the tree, but instead of completing the cut started by the first beaver, he made a new one three inches to four inches above the first partial cut. In several instances, trees had been cut off by the beavers, but instead of falling the butt of the tree had slip-

ped off of the stump and was held upright, its branches being entangled among neighboring branches. Near a rather flat topped hill some fifty feet above the level of Dead River near Marquette, Michigan, there was an old dam; from just above this dam, as also from Rainy Creek on the other side of the hill, canals had been cut across the rather level ground to the base of the hill in order that the poplars growing on the sides of the hills might readily be transferred to the streams. The canal running just above the dam to the mouth of the ravine was about 130 feet long. Down the steep hillsides were worn well used slides down which the beavers coasted their logs. Some poplar trees on the sides of the ravine had been cut and in falling had fallen across the ravine and lodged with the butt on one side and the top on the other. The beavers were evidently puzzled to meet this situation. The top had been gnawed as also the butt, irregularly, but a dozen such trees had been abandoned.

Apparently we have a mixture of keen intelligence and inexplicable stupidity from this same animal and I am not prepared as yet to state any definite conclusions regarding the degree of intelligence.
