extent, *in situ*, at a depth of 1,500 fathoms, was quite unexpected in this part of the Atlantic.

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POSITION OF WOOD IN BEAVER DAMS

A TYPICAL beaver dam is a bank of earth reinforced with brush, in vertical sections approaching an equilateral triangle with a rounded apex. The reinforcing branches do not show on the upstream side of the dam; the slope in that direction is covered with a thick layer of solid earth. But on the downstream side the branches continue outward as a bed of brush a foot or so thick, covering the face of the dam from crest to foot, their very important function being to prevent erosion by the water flowing over the dam.

Every writer known to me who goes into details of beaver dam construction, says that these branches are placed with their butts upstream. Thus Morgan[1] writes in his monograph: "In general the large ends of the poles and of the limbs with their branches attached were upstream, which itself would tend to strengthen their hold on the bottom."

Mills[2] says: "The majority of dams are made of slender green poles. . . . With these are used occasionally small limby trees. The large end of the trees is placed upstream and the bushy end downstream."

Equally definite is Dugmore:[3] "As a matter of fact the building of an ordinary dam consists originally of a number of sticks and brush being laid (no stakes are driven) in the water with butts upstream."

Johnson[4] makes some qualifications: "Boughs are generally found with the butt end upstream, but numerous examples occur where they lie across the current, diagonally and in every intermediate position."

And lastly Warren,[5] in the best book yet written on the beaver: "Branches of willow, alder or whatever brush is most available . . . are cut and placed on the bottom with the butt ends upstream, and often forced into the bottom."

Now for twelve years I have been observing the work of a beaver family established on a small stream tributary to the Ottawa River near Arnprior, Ontario. There is nothing out of the ordinary in the situation. The stream rises in a group of springs, and with a moderate current flows a distance of two miles through a shallow thickly-wooded valley. Before the beavers came it had a fairly uniform width throughout its whole length of four to six feet, and a depth varying from six inches in its upper part to three or four feet in its lower reaches. The beavers occupy the last half-mile of the stream, where there is, or rather was a good supply of poplar and other favorite woods, and their dams have expanded this section of the stream into a pond four or five feet deep and about 300 feet wide.

At one time and another these beavers have built nine dams, and have rebuilt or repaired five or six dams that broke. In every case, both in new work and repairs, the great majority of the branches used in construction were laid with butts *downstream*, in direct opposition to the beaver practice unanimously alleged by the writers quoted. As mentioned by Johnson,[4] some of the branches were placed in every possible position, but at least 90 per cent. with butts downstream. To venture on an *a priori* argument, it may be said that this disposition of the branches is what might be expected. In general, beavers float their wood downstream: naturally it is towed butt-end first to prevent twigs and branches from catching, and it is likely to be laid in position without change of direction, that is, butts downstream.

Certainly such is the habitual and uniform procedure of my beavers, both in new construction and repairs. There is no reason to suppose that they differ in any way from other beavers, and there does not appear to be anything in their environment that might cause a reversal of habit.

I have had no opportunity of examining critically beaver dams elsewhere, but perhaps some field naturalist who is familiar with dams in different parts of the country will say if the wood in other dams really is laid with butts upstream.

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[1] Lewis H. Morgan, "The American Beaver and its Works," p. 103, 1868.

[2] Enos A. Mills, "In Beaver World," p. 66, 1913.

[3] A. R. Dugmore, "The Romance of the Beaver," p. 34, n. d. (ca. 1914).

[4] C. E. Johnson, "The Beaver in the Adirondacks," *Roosevelt Wild Life Bulletin*, p. 632, July, 1927.

[5] E. R. Warren, "The Beaver," p. 28, 1927.

VIRGINIA GEOLOGICAL SURVEY FIELD WORK

DURING 1931 the Virginia Geological Survey has conducted an extensive program of field work, under the supervision of the State Commission on Conservation and Development, Mr. William E. Carson, chairman, and Dr. Arthur Bevan, state geologist. The results of each of these projects will probably be published as survey bulletins.

This field work consists of the following projects:

The survey of the geology and mineral resources of the Hot Springs district in the central-western part of the state is being continued by the state geologist. He has been assisted at times by Mr. C. R. L. Oder, of the University of Illinois, Mr. Paul Averitt, of the University of Kentucky, and Mr. R. L. Laurence, of the University of Cincinnati. This area is also being topographically mapped, in cooperation with the