

were placed, butts downwards, about the sides of the lodge with the thin ends terminating across the apex. The apex, it should be said, was free of solid material, merely a network of sticks through which air filtered to the "room". When winter comes the welfare of the occupants of any beaver lodge can be ascertained by means of a wisp of vapour feathering through a hole in the snow above this efficient ventilator, telling of life within. Since this lodge was built it has assumed much larger proportions. In the spring of 1931, numerous sticks were thrust into the walls and covered with mud. In the autumn of 1931, a great deal more material was added than necessary to replace that lost by erosion during the summer. Owing to the lateness of the season when it was built the beavers were undoubtedly working against time and probably did no more than erect a habitation with a small margin of safety and comfort to meet the emergency that faced them.

The manner of lodge construction as shown by my observations proves conclusively that when building a habitation beavers do not leave the centre of the structure clear of accumulated material as the work proceeds, although the evidence is in favour of a deliberate intention to place little or no muck other than about the walls. I cannot say whether the floor of the lodge is made during the course of construction or after the "room" is formed, or if the inside walls of the "room" are finally covered with mud. Regarding the latter, I feel sure that no additional material is applied after the projecting sticks are cut flush with the walls and removed together with other interfering debris. In any event, a beaver lodge is a very masterful piece of work often given no more consideration regarding its technical details than an instinctively built bird's nest. There is, of course, no comparison.

Apart from lodges, every beaver pond on the Riding Mountain range includes one or more dens, visited by the beavers from time to time and probably used as hideouts when danger threatens. Burrowed in the banks of the pond at a place where the ascent of the slope is steep, they terminate in a "room", high above the water, large enough to shelter an entire beaver family. The entrance may be deeply submerged; often it is in shallow water approached by a canal, and sometimes above the surface at the water's edge. Investigation of the dens located at the sites under observation, and in many dry ponds, show that the roof of the "rooms" is from 18" to 24" below ground level, protected above by the roots of trees or shrubs in the same manner as the den behind the "bank" lodge at Site No. 1. They are generally some distance from the lodge. Never close by. I have one record of a beaver den excavated beneath a large granite boulder, the bottom of which is the roof. The length of the tunnels between the entrance and the rooms could only be roughly estimated. I would say that usually they are between 15' and 20' long, measured in a straight line from above.

A number of holes in the banks of the Vermilion river, and elsewhere in the Riding Mountain, indicate from the manner of their construction that they were excavated by beavers. As they were more or less remote from ponds there is some suggestion of occupation by migrants travelling down stream. Shredded willow bark was found in the "rooms" of more than one, together with peeled aspen-poplar sticks and other vegetable debris. It is quite possible that migrating beavers may even have survived a mild winter within these shelters, gathering food from day to day.

(To be concluded)

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## NOTES AND OBSERVATIONS

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NIGHT ALARM.—On June 9th, 1929, at the north narrows of Moose Lake, Manitoba, I saw a bear (*Ursus americanus*) swim out just after dark to a long narrow island occupied by gulls and terns, and at its northern and nearer end only about one hundred yards from shore. In the darkness he could only be seen for a few feet after he left shore. However, pandemonium broke loose on the near end of the island, and gradually progressed along its length. After

a while all was quiet again. Unfortunately I did not have an opportunity to visit the island and see if there were any signs of his passage.

The attitude of the bear throughout was that of one who had been there before.—C. H. D. CLARKE.

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MOOSE SEEKS SHELTER FOR YOUNG. — Late in August, 1929, members of a forest survey





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