

THE BEHAVIOUR OF THE RED SQUIRREL.—II.

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The Red Squirrel, of whose behaviour I gave an account in the April number of *THE OTTAWA NATURALIST*, is still under observation, and I have been able to obtain some additional data concerning it. It is no tamer than it was last year and this fact allows us to regard its activities as typical of the species in the wild state.

A fact which has come out very clearly in the course of my prolonged observation of this squirrel is that it possesses an individuality of appearance. Its characteristic appearance is something practically impossible to define, but is none the less easily recognizable. It is a matter of "expression", as I find that I can be sure that it is *Adjidomo*, which is Ojibwa for Red Squirrel and the name by which I refer to this individual, only if I get a look at his face. When I look at the face of either of two other Red Squirrels which live in the vicinity I know at once that they are not *Adjidomo*. The other two squirrels I cannot tell apart, though it is probable, if not certain, that they too have a characteristic appearance which would be revealed by close and frequent observation.

FOOD.

One rather interesting point in connection with the food-habits of the Red Squirrel became apparent during the summer. I had always regarded bark as being a food material which was only made use of by the squirrel as a last resort—a "starvation diet" to be used only when other more attractive foods were not available. But during the summer and fall, though the squirrel was well supplied with various articles of diet, such as nuts, bread, meat, etc., he continually made meals of the bark of the hard maple. He chiseled off the gray outer layer and ate the greenish and white inner layers. The maple bore no seeds this year, and what natural food resource the squirrel could have used this winter is hard to see. The only one I know of is the horse chestnut, and during the fall he stored a good many of these.

STORAGE.

A few more points in connection with the storage of food have been observed. One fact which stands out quite clearly is that when an object is being placed in position for temporary storage it must rest against something, as well as on something. The object is usually placed in a fork of the tree, as mentioned in my previous article, but any angle, such as that formed by the top rail of the verandah and a post, will serve, and even a splinter projecting

from the surface of a board will satisfy his idea of stability. It appears as if the main idea underlying the operation is to keep the object from rolling.

The squirrel often has some difficulty in deciding upon a suitable location in which to deposit an object and frequently carries a piece of food round from place to place, trying several locations before finally depositing it. Further than this, it is not always satisfied with the place it has selected and returns, hauls out the object and deposits it in another place. This may be done almost immediately after it has been first placed in position or after the elapse of half an hour or so. If it takes a large piece of food from its location and eats a portion the remainder is almost invariably deposited in a new place.

During the summer, at a time when I was not supplying any nuts, he went to his main store under the shed, brought out nuts stored in the spring, carried them up the tree and ate them.

At the end of November, when a little snow had fallen, he buried food in it. The layer of snow was not deep enough to enable him to use his usual method of shoving the object into the snow with his muzzle and scraping snow on it from right and left with his paws, so he turned his paws over so that the palms were upward and shovelled snow on the object in this manner.

OWNERSHIP OF STORES.

Adjidomo has apparently lost the chief menace to the food which he stores in the forks of the tree, as the other squirrel which used to raid these stores has disappeared. I have not seen it since May. But there are still several other "pests" which pilfer his stores and have to be chased away. A pair of White-breasted Nuthatches frequently visit the tree and in trying to eat the pieces of food lodged in the forks usually manage to knock most of them out. A Downy Woodpecker and a Hairy Woodpecker also play the same game. The House Sparrows are also a constant source of annoyance to him, and he chases them with great dash and wonderful agility. Time and time again I have seen him spring almost on top of one of them, and it often looks as if he could have seized the bird if he had so desired. When chasing the sparrows he bounces about among the branches for all the world like a rubber ball, and one day when pursuing one of them on the verandah I saw him make what I regard as the most remarkable spring I have witnessed—a leap of five feet with a rise of three feet. It is to be noted that

all a squirrel's long leaps are taken from a higher to a lower elevation, and I have observed that Adjidomo will not attempt a long leap except under these conditions.

RESTING.

During the hottest weather of the summer he rested more than at other times of the year. He selected a shady place on a large limb and stretched himself out at full length.

SUNNING.

Last winter I was somewhat puzzled by the squirrel's fondness for a perch which did not strike me as particularly comfortable—on a large nail in the trunk of the tree to which a clothes-line is attached. This perch was not used during the summer, but with the return of colder weather he again frequents it, and it is now plain that he takes up his position there because he is then sheltered and gets the full afternoon sun.

In connection with the squirrel's use of this perch a little episode occurred for which I can offer no explanation, but which caused us some annoyance. One day when the line held its full quota of clothes the squirrel cut it through at the point where it was attached to the nail, with somewhat disastrous consequences to the "wash". Subsequently he again cut the line down when it was empty, but since then he has left it intact.

LISTENING.

I have noticed that the squirrel has two attitudes which are assumed in intent listening. If it is on "all fours" it folds one front paw, nearly always the right, and places it against its breast. If it is sitting up it folds both front paws and brings them together against its breast. In both cases the head is elevated and is often turned from side to side.

PLAYING.

This squirrel is at least three years old, how much older I do not know, but it frequently plays. When the first snow-fall came it plunged about in it, dashed through the deep piles on the large limbs and evidently enjoyed itself thoroughly. It frequently goes through a remarkable performance which we must classify as a game, since it certainly serves no useful purpose. At the top of the trunk of the maple at the point from which the main limbs are given off there is a trough-shaped, vertical cavity, some eighteen inches long with a pocket-shaped bottom. The squirrel gets in this cavity, turns over and over in a series of somersaults, sliding down the trough on his back at each backward turn. He sometimes seizes his tail and rolls about in the pocket holding on to it.

EXPRESSION OF EMOTIONS.

The emotions of the squirrel are expressed mainly by attitudes, more rarely by the voice. Surprise, fear, curiosity, anger, contentment, all have their

characteristic attitudes. The attitude of surprise is either one in which the animal draws itself back on its haunches and allows both forepaws to hang from the sides, or else picks up first one fore-paw and then the other. In fear the body is flattened, head dropped, tail straight out. Anger is shown by the stamping of the hind feet, and jerking of the tail, sometimes by the stamping of the front feet as well. In curiosity the neck is stretched out to a surprising length. In the attitude of contentment the animal is usually sitting up with the tail flat along the back and the tip over the ears. These emotions are well-defined but as to whether joy finds expression in behaviour I have not yet definitely determined, though I have noticed a certain high bounding which it exhibits only when it has discovered a supply of food.

The voice seems only to be used in anger and pain. The scolding chatter is familiar to everyone, but I have observed that Adjidomo has chattering notes of different quality which he employs apparently in different degrees of anger. A cat excites his most intense wrath, and when he sees one anywhere near the base of the maple he breaks out into a very loud, sharp chatter of such a quality that I can now tell at once the cause of his indignation. It takes him some considerable time to get over a fit of cat scolding, and it is interesting to notice the order in which the different vocal elements which compose the compound chatter die out. The note which persists the longest is the little nasal "Tscherk", and these gradually grow fainter and further apart until his equanimity is restored. The chattering is always accompanied by stamping of the hind feet, which action sometimes is so violent as to become a veritable dance. It might perhaps be claimed that the chatter denoted only excitement and not anger, but this is disproved by the fact that he can get very excited without chattering and that upon three occasions when he has had cause for anger but not for excitement he has chattered. One of these episodes I will mention as typical. I had put two very hard buns out for him. He had some difficulty in getting a firm grip on one of the buns with his teeth because of its hardness and large size, but finally made off with it. He ran up the branch from which he jumps to the roof of the next house, gathered himself together and sprang across. But in mid-air the bun slipped and fell to the ground. The slipping of the bun upset his leap, but he managed to alight safely, though far from gracefully. He then looked over the edge of the roof after the bun, "registered surprise", (as they would say in the movies), and then chattered and stamped. He soon returned for the other bun, again had a struggle to grip it, carried it up the branch as before, and jumped—with the same result, the bun slipping from

his teeth in mid-air. After this second failure he was thoroughly angry, and chattered and stamped for a long time.

I had never heard Adjidomo give vent to a cry of pain, but one day he caught the other squirrel which had been stealing his stores, and apparently bit him so severely that he uttered several high-pitched squeals.

I have never heard Adjidomo use the long, rolling, "Chir-r-r-r-r-r-r-r" call. This is apparently an inter-communication call and thus is not used by an isolated individual.

MOODS.

Having this squirrel under observation day after day it has become quite apparent to me that he is subject to moods. On some days he is far more nervous and "jumpy" than on others, and the probability is that on these days he has received a bad fright, I say "probably", because I have not yet been able to establish the connection between this condition and its cause. Certainly on days on which he has been made angry he is more irritable than at other times.

BEHAVIOUR UNDER UNUSUAL CIRCUMSTANCES.

In judging the mentality of any animal one of the best tests we can apply is the manner in which it behaves under unusual circumstances. Instinct will look after all ordinary activities, but instinct fails when confronted with new conditions. The ability to meet new conditions successfully implies intelligence.

During the summer the portions of the limbs of the maple which hung over the roof of the next house were cut off, including the end of the limb along which the squirrel travelled on his way to the roof. Soon after this had been done Adjidomo

appeared, ran along his old route towards the roof, arrived at the cut end of the limb, paused a moment and ran down the limb and up the next one which projected in the direction of the roof. This limb had also had its end cut off, so he again descended and then tried each limb which lay towards the roof in turn until he found one from which he could spring to the roof. He then continued to use this path for some three or four weeks, and in fact still uses it for his return journey, but he has found that by going a short distance up a nearly vertical branch, which projects from the limb he used in the first place, he can make the roof. Just when he discovered this I cannot say as he was using this route when I returned after a month's absence.

One day the squirrel found a long piece of crisp rind. He tried to carry it off, but finding it too heavy and awkward to handle, he put his front feet on it, and pulling with his teeth broke it in two.

On another occasion I placed a nut with a thread attached to it on the verandah and fastened the other end of the thread. Adjidomo soon came along, seized the nut and started to run off with it, but was stopped with a jerk by the thread. He turned round and tugged for some fifteen seconds, then bit through the thread and carried off the nut.

MEMORY.

When we returned home, after an absence of six weeks, the squirrel, as soon as he caught sight of us through the window, immediately darted over to his old feeding place. Nothing had been placed there during our absence, and the incident is interesting as showing a perfect memory for six weeks, and also as showing that he associated our presence with the probability of a supply of food.





Klugh, A. B. 1919. "The Behavior of the Red Squirrel II." *The Ottawa naturalist* 32(8), 150–152.

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