

THE BEHAVIOUR OF THE RED SQUIRREL.

BY A. B. KLUGH, M.A., DEPARTMENT OF ANIMAL BIOLOGY,
QUEEN'S UNIVERSITY, KINGSTON, CANADA.

For the past eight months, that is from October to May inclusive, I have had a male Red Squirrel (*Sciurus hudsonicus loquax*), under almost daily observation. The conditions for acquiring information on the normal behaviour of this species have been practically ideal. This squirrel is not tame and I have purposely refrained from any efforts to render it so, since conclusions drawn from the actions of a tame animal are of very doubtful value when applied to the species in the wild state. It has made its headquarters in a large sugar maple tree which grows beside the house, the main limbs of which are on a level with, and close to, my second-story verandah, while the tips of the branches are on a level with a window on the third story.

The reason why the squirrel selected this tree as its headquarters is not far to seek, as last year this maple produced an exceedingly bountiful crop of keys, which were lying thickly on the ground beneath it and on the roof, while all the other trees in the vicinity are soft maples whose keys had long ago germinated.

FOOD.

The main natural source of food supply of the squirrel has been the keys of the sugar maple; the second most important has been the buds of both soft and sugar maple. During April it consumed considerable quantities of buds, first of the soft maple and later, when the buds of the latter species had expanded, turning its attention to those of the sugar maple. After the leaves of the sugar maple were about one-third expanded it cut off a good many of the four-leaved sprays and ate the tender young stem, allowing the leaves to fall to the ground.

At the end of March, when the sap was flowing from broken twigs of the sugar maple and running down the under-side of the branches, the squirrel devoted most of its time to drinking sap. In order to get at this sap it had in most cases to hang upside-down, in the manner shown in Figure 1. When thus hanging from a small branch both fore and hind feet were clasped about the branch so that the toes nearly met on top of the branch. When hanging from a large limb its position looked a good deal more precarious, but it maintained its hold with ease and certainty, and though I saw it thus suspended from large limbs over a hundred times I never saw a single slip. When in this pos-

ition it relied chiefly on its hind legs, and there was a decided bend outward in these legs at the tarsal joint, this bend evidently enabling the claws to catch the crevices of the bark more effectively.



Fig. 1—Squirrel in position assumed when drinking sap.

When drinking sap it laps it up, its tongue going at a tremendous rate.

I have tried the squirrel with many different articles of food, such as meat, vegetables and nuts. For green vegetables, such as cabbage and celery, it has no great fondness. It likes meat, but its favorite food is undoubtedly nuts—hazels, walnuts, beechnuts and hickories. It also relishes sweet substances, as candy and jam.

MANNER OF EATING.

When eating anything which can be picked up it invariably takes it between its fore-paws, and sits up in the position shown in Figure 2. The position



Fig. 2—Squirrel in characteristic eating attitude.

of the tail when in this attitude varies a good deal, as it may be straight out along the limb, raised slightly from the limb and with a downward curve, or the basal portion resting on the limb and the apical half curved upward. But when it settles itself to consume something which will take some time to eat, it almost invariably elevates the tail straight in the air or applies it even more closely to the back. In eating a nut it first gnaws through the shell at a point just to one side of the apex, then breaks away the shell until it has consumed all the meat. In eating a beechnut it pulls one of the sides off with its teeth and then gets the kernel out whole.

STORAGE.

The squirrel practices three methods of storage—carrying things off to one of its main hoards, burying each object separately, and arranging them in a fork or on a limb. It classifies the things that it stores into two classes—hard objects and soft. Hard things such as nuts and seeds it either carries to one of its hoards or buries; soft things, such as meat, apples, etc., it arranges about the tree. It thus buries nothing which will mould or decay readily. It has several main hoards, though I only know the exact location of two, and when it is carrying off a number of things consecutively it takes them to two or more of these hoards alternately. When it buries a nut in the soil it scratches out a hollow with its fore-paws, places the nut in it, shoves it in as far as possible with its nose, and then covers it with a few swift strokes from right and left with the fore-paws. It performs this operation with much rapidity, but does it so well that when it has buried a nut in a location where there is moss and dead leaves there is no trace of any disturbance. In fact upon three occasions I noted the location of the spot at which I had seen it bury a nut as accurately as possible, but upon going to the place I was unable to find the nut.

During the winter its chief method of storage is burying in the snow. In doing this it shoves the object into the snow with its nose, then covers it with a few quick sweeps from right and left with its fully extended fore-paws. It will thus bury in the snow not only nuts and other hard objects, but also pieces of meat and small apples. That is, it treated them as hard objects, as indeed they soon were, being frozen solid in a short time.

CARRYING CAPACITY.

It is able to carry off objects of considerable weight, as the following instance shows. On the morning of May 11th, it entered the pantry through the open window. There it discovered a bowl of boiled potatoes, some of which it hid behind cans in the pantry, while it carried others up the maple

tree and arranged them in the forks. Some of the potatoes which it carried up the tree weighed a quarter of a pound.

TUNNELLING UNDER THE SNOW.

When the snow became deep the squirrel made tunnels beneath it, first driving the tunnel which touches the tree, and later constructing the system of tunnels shown in Figure 3. During the winter

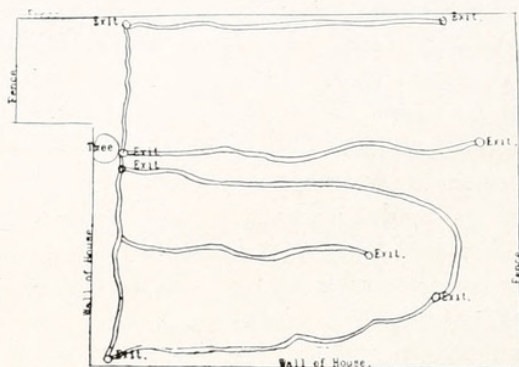


Fig. 3—Plan of tunnels of red squirrel under the snow.

I was able to judge somewhat of the extent of the tunnels from the positions of the exits, and when the snow thawed I was able to map them.

The purpose of these tunnels was to gain access to the keys of the sugar maple which were so thickly scattered about the yard. The squirrel usually brought them to one of the exits to eat.

ACTIVITY IN WINTER.

It was out every day during the winter except in very stormy or in extremely cold weather. At such times it would not appear for two or three days at a time.

LEAPING ABILITY.

None of the leaps which I have seen it make seemed to tax its leaping power at all. A jump which it made often dozens of times a day in the winter was from the roof to the main crotch of the maple tree—a distance of eight feet with a drop of two feet. I noticed that it never tried the return leap, that is a leap which would land it two feet higher than its starting point, but always ran out on a limb and then to the roof.

In leaping it extends its legs and flattens its body, while the tail is straight and stiff behind it.

MANUAL DEXTERITY.

Though it lacks a "thumb" its dexterity with its fore-paws is much greater than in the case of most animals. By taking them between its paws it handles both large and small objects with the utmost precision and certainty. It can turn a smooth and slippery nut round and round in its paws and I have never seen it let anything slip. I have seen

it reach out and pull off a bud with a single paw, folding the toes against the palm in doing so, and also place a piece of a leaf in its mouth with one paw.

BALANCING OF OBJECTS.

The squirrel is most expert in balancing objects on branches. Usually it selects either a crotch or the somewhat flat surface at the point at which a horizontal branch comes off from the limb as the place of deposition. When placing anything in position it shifts it a trifle to one side or the other with its paws or muzzle and does not leave it until it is as securely lodged as possible. It succeeds in balancing nuts in situations in which I should not like to undertake to balance them. I noticed that when it hung a long strip of ham-rind, an article of diet with which it can hardly have had previous experience, on a branch it shifted it until the two ends hung equally on each side of the branch. Out of the scores of times that I have seen it balancing objects I have only once seen it let anything fall, and upon this occasion it made a most strenuous effort to catch it but failed.

RESTING.

The squirrel does not often rest. It is almost ceaselessly active from early morning till dark, and during this time it is eating almost continuously. However it does rest, and even sleep, occasionally. Its favorite resting-position is spread out along a limb, with its legs out straight in front and behind and with its chin resting on its fore-paws. When it composes itself for a nap it hunches itself up, rests its chin on the limb, and flattens its tail down along its back. I have only once seen it go right off to sleep—as a rule its eyes are closed completely only for a moment at a time.

It has certain favorite places for resting, the most favored situation being on a rather small, nearly horizontal, branch at the point where it comes off from a larger branch. Here it sits with its posterior end against the larger branch in such a way that it gives one the impression that it "fits in" there.

I have seen it stretch—first one paw and then the other—and yawn. It often rubs its jaw and throat along a limb, in this respect reminding one very much of the actions of a cat.

WASHING.

After it has eaten anything sticky or greasy it licks its forepaws very thoroughly and then rubs them over its nose. It sometimes spends five minutes thus cleaning up.

SCRATCHING.

During the winter it did not seem to be troubled with insects, but in the early spring they apparently gave it a busy time. It scratched and bit itself very

frequently and often for some time at a stretch, causing the shedding hairs of its winter coat to fly in all directions.

"FREEZING."

Upon two occasions when a hawk flew over, and upon another when it caught a sound like the scream of a hawk, the squirrel "froze", remaining absolutely motionless for three minutes or more. As soon as it moved it exploded into a loud and long-continued chatter.

PSYCHOLOGY.

In the study of any animal the most interesting thing, and at the same time the phase of the subject in which we have to proceed most cautiously in drawing conclusions, is its mentality. My close observation of the squirrel during the past eight months has given me some glimpses of the psychology of this animal.

The sense of ownership is a mental attribute which seems to be well developed. This squirrel appears to regard the sugar maple as its own private preserve. All through the winter it drove away any house sparrows which perched in it. Toward spring another squirrel sometimes came into this tree, and this always resulted in a great deal of barking and chattering, and ended in the retreat of the intruder, hotly pursued. This squirrel was also a male and was as large and apparently as strong as the "owner" of the tree, but it fled without putting up a fight. Once this second squirrel came into the tree when the "owner" was away, and finding some pieces of meat it proceeded to eat them in such a hurry that it choked.

The squirrel watches the things it has stored in the tree most jealously. Upon several occasions a white-breasted nuthatch has come and pecked at some of this food, and whenever this has been observed by the squirrel it has come on the jump and driven it away. Once the nuthatch came and pecked at a piece of meat, the squirrel drove it away, and then as the nuthatch flew the squirrel bounded over to another piece of meat as if it anticipated an attempt upon that piece also.

Does the squirrel know where it has placed things? This question has frequently been discussed and I can answer it most decidedly in the affirmative, as time after time I have seen it go by the nearest route to something it had stored and proceed to eat it. I am not prepared to say that it never forgets anything, indeed if it did not it would imply a far better memory than that of a human being.

Curiosity is an attribute which the squirrel exhibits to a marked degree. Any new object is at once seen, carefully approached and investigated. It seems as if the squirrel's method of investigation entails not only smelling a thing but trying it with

its teeth. This certainly was the case with my camera. When it first saw it set up it was afraid of it, then it watched it as it passed it, then went up and smelled it and finally climbed on top of it and took a nip of the bellows, which was carrying it a bit too far from my point of view.

A couple of incidents which throw some light on the psychology of the squirrel I shall describe and let the reader draw his own conclusions.

One day the squirrel took a big piece of meat from which the fat had been rendered, carried it to the edge of the roof from which it usually made

its eight-foot leap, gathered itself as if about to jump, then checked itself, hesitated a moment, and then carried the meat up onto the roof of the verandah and thus to the tree. With small objects it always made this leap without any hesitation.

On May 15th, I placed a pile of apple-peelings and two small apples on a board which projected out over the roof. The squirrel was pulling at a long peeling when one of the apples rolled towards it and was about to fall off the board. It dropped the peeling and seized the apple just in the nick of time.

BRIEF REPORT OF THE OTTAWA FIELD-NATURALISTS' CLUB FOR THE YEAR ENDING MARCH 19, 1918.

The activities of THE OTTAWA FIELD-NATURALISTS' CLUB during the 39th year of its existence, in popularizing and diffusing knowledge of the natural sciences, have been carried on chiefly in three ways: a course of seven lectures, twelve field excursions and the publication of THE OTTAWA NATURALIST which has now completed its 30th volume.

Thirty-two members were elected during the year making a total membership of 367. Twenty-one members serving overseas are carried gratis.

The lectures were planned to create a more intelligent interest in Canadian natural history and to give a better understanding of the value of scientific work. Through the co-operation of the Librarian of the Carnegie Library a programme for next season, covering the meetings of the various literary and scientific societies, will it is hoped be arranged, thus reducing to a minimum the conflict of dates.

The field excursions were announced in the daily papers in order that the general public as well as the club members might take advantage of them. Scientific men, both members of the Club and others at the request of the Club, attended the excursions to direct interest and answer questions.

The following are the officers and committees for the club year 1918-1919:

President, C. Gordon Hewitt; *Vice-Presidents*, M. Y. Williams, L. D. Burling; *Secretary*, Clyde L. Patch; *Treasurer*, J. R. Dymond; *Editor*, Arthur Gibson.

Additional Members of Council: P. A. Taverner, F. W. Waugh, C. M. Sternberg, W. T. Macoun, G. A. Millar, Miss M. E. Cowan, Dr. R. M. Anderson, H. McGillivray, C. B. Hutchings.

STANDING COMMITTEES OF COUNCIL.

Publications—Clyde L. Patch, A. Gibson, P. A. Taverner, L. D. Burling, H. B. Sifton.

Excursions—F. W. Waugh, H. B. Sifton, C. M. Sternberg, G. A. Millar, Miss M. E. Cowan, C. L. Patch, H. McGillivray, C. B. Hutchings.

Lectures—M. Y. Williams, P. A. Taverner, L. D. Burling, W. T. Macoun, G. A. Millar, R. M. Anderson.

Membership—F. W. Waugh, A. Gibson, Miss M. E. Cowan, J. R. Dymond, P. A. Taverner.

Trust Funds—W. T. Macoun, C. Gordon Hewitt, H. M. Ami.

Auditors: J. Ballantyne, E. C. Wight.

LEADERS AT EXCURSIONS.

Archaeology: Harlan I. Smith, F. W. Waugh, W. J. Wintemberg, Dr. C. M. Barbeau, Dr. E. Sapir.

Botany: G. A. Miller, W. T. Macoun, J. M. Macoun, Mrs. A. F. Brown, Dr. M. O. Malte, J. R. Dymond, E. C. Wight, H. B. Sifton, Miss M. E. Cowan.

Entomology: Arthur Gibson, Dr. C. G. Hewitt, J. M. Swaine, F. W. L. Sladen, C. B. Hutchings.

Geology: Dr. E. M. Kindle, Dr. M. Y. Williams, H. McGillivray, L. D. Burling, E. Poitevin, Dr. M. E. Wilson.

Ornithology: C. L. Patch, P. A. Taverner, Dr. M. Y. Williams, A. G. Kingston.

Zoology: Dr. R. M. Anderson, A. Halkett, E. E. Lemieux, E. A. LeSueur, C. H. Young, C. E. Johnson.

Photography: W. S. Hutton.



Klugh, A. B. 1918. "The Behaviour of the Red Squirrel." *The Ottawa naturalist* 32(1), 9–12.

View This Item Online: <https://www.biodiversitylibrary.org/item/17589>

Permalink: <https://www.biodiversitylibrary.org/partpdf/368541>

Holding Institution

MBLWHOI Library

Sponsored by

MBLWHOI Library

Copyright & Reuse

Copyright Status: Public domain. The BHL considers that this work is no longer under copyright protection.

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.