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OBSERVATIONS ON THE SMALL MAMMALS OF THE SOUTHEASTERN SHORE OF HUDSON BAY

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THIS REPORT IS BASED ON trips made in 1950, 1953, and 1954 to Hudson Bay and Richmond Gulf. The first, an ecological reconnaissance of the Richmond Gulf area (Edwards and Chamberlin, 1951), was financed by the American Philosophical Society; and the second, during the summer of 1953 (Edwards and Chamberlin, 1962), to investigate the hydrobiology of southeastern Hudson Bay and Richmond Gulf, was financed jointly by the American Philosophical Society, the Woods Hole Oceanographic Institution, the Geological Society of America, and the American Academy of Arts and Sciences. The research was continued in the summer and fall of 1954 with funds obtained from the Arctic Institute of North America.

Dr. J. Lockwood Chamberlin* was my partner on all of these trips. His interest was the invertebrate marine fauna and the hydrography of the area. My father, Robert D. Edwards, accompanied us on the first leg of the 1953 trip.

We made the trip to Richmond Gulf in 1950 on board the M/V *Fort Charles* through the courtesy of the Hudson's Bay Company. The 1953 and 1954 trips were made aboard our own research vessel, the R/V *Lemming*, a thirty-foot ex-shrimper.

From the viewpoint of a mammalogist, the summer of 1950 was desolate around Richmond Gulf, following as it did the die-off of the rodent population of the previous fall. We spent two weeks circumnavigating the area that season, trapping (over 900 trap-nights) wherever we stopped. Not a single microtine was seen or caught. The loneliness of the land was relieved only by the presence of a few red squirrels, a porcupine and a weasel. However, numerous skeletons of mice and large scat piles pointed to a large rodent population during the previous summer.

Although the rodents were numerous in 1953, an expected peak year of the four-year cycle, our success in collecting small mammals was less than we had hoped. The difficulties of doing hydrographic work from a small boat in Hudson Bay, under generally adverse weather conditions, severely limited our opportunities to work on land. Whenever the opportunity presented itself, we went ashore to set traps and make observations of the rodents. By standing quietly we could usually see several moving about and feeding, where in 1950 not a single microtine was to be seen or trapped.

We named our anchorages and prominent features of the landscape. It should be emphasized here that many of these names do not have any official

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sanction. Such unofficial geographic references are indicated by an asterisk when used for the first time.

Subspecific designations have not been attempted, pending further study with more extensive material than is presently available from the entire northern Quebec area. The bulk of the material has been deposited in the Museum of Comparative Zoology, Harvard University.

AREAS INVESTIGATED

Each of the areas trapped is described briefly below. A short description of the plant life is included. For further detailed information on the plants and plant associations, the reader is referred to Marr (1948), Hustich (1951), and Dutilly and Lepage (1951).

Merry Island ($55^{\circ}22'N$, $77^{\circ}45'W$). The southernmost island of the Manitounick Peninsula (see inset, Figure 1) is a tilted thrust block with the high steep face on the sound (east) side. This topography is typical of the Hudson Bay coast from here on to well north of Richmond Gulf. A canyon-like cut runs through the island a short distance north of the tip. The distinctive green aspect of this cut, with its small spruce forest, completely isolated from the mainland and from similar plant communities along the island chain, attracted our attention late in the afternoon of August 23, 1953.

The cove at the end of the cut was small with a relatively rocky beach. Above the strandline was a broad zone of the grass *Elymus arenarius*. Beyond this there was an extensive area of shrubs and forbs, including *Salix* (several species), *Juniperus*, *Betula*, *Vaccinium*, *Arctostaphylos*, several species of *Carex*, *Solidago*, *Potentilla*, and *Saxifraga*. Farther back of this where sufficient sandy soil existed, was the spruce *Picea mariana*. The ground cover in the spruce was composed to a great extent of lichens and mosses, with *Cornus canadensis*, *Ribes glandulosum*, *Linnaea borealis* and *Empetrum nigrum* in patches and individually. On the rocky talus areas a more typical tundra flourished, composed largely of many kinds of reindeer mosses, with *Vaccinium Vitis-ideae*, *Empetrum* and *Dryas integrifolia* in abundance. A substantial growth of dwarf *Betula* and *Salix* species occupied the lower parts of the talus slopes.

Twenty-five traps were put out just before dark, in a line running through all of the above-mentioned plant communities. Shortly after dark the trapline was checked and when five *Phenacomys* were found to be trapped, principally in the drier portions of the talus, ten more traps were put out in this area. The traps were removed the following morning when we departed.

**Three Islands Harbor* ($56^{\circ}07'N$, $76^{\circ}04'W$). The trapping was done on the westernmost of three small islands that form a protected anchorage in the southeastern part of Richmond Gulf. A narrow band of *Elymus* with an admixture of *Ligusticum scoticum* bordered the strandline on the harbor side, followed by a substantial growth of alder (*Alnus arctica*), and succeeded in turn by a dense thicket of small spruce where the slope steepened. Near the top of the island, where it leveled out, a typical reindeer moss tundra, with a scattering of *Vaccinium uliginosum* and *V. Vitis-ideae*, *Epilobium*, *Ledum*, *Salix reticulata* and other dwarf willows, was followed by the bare rock top.

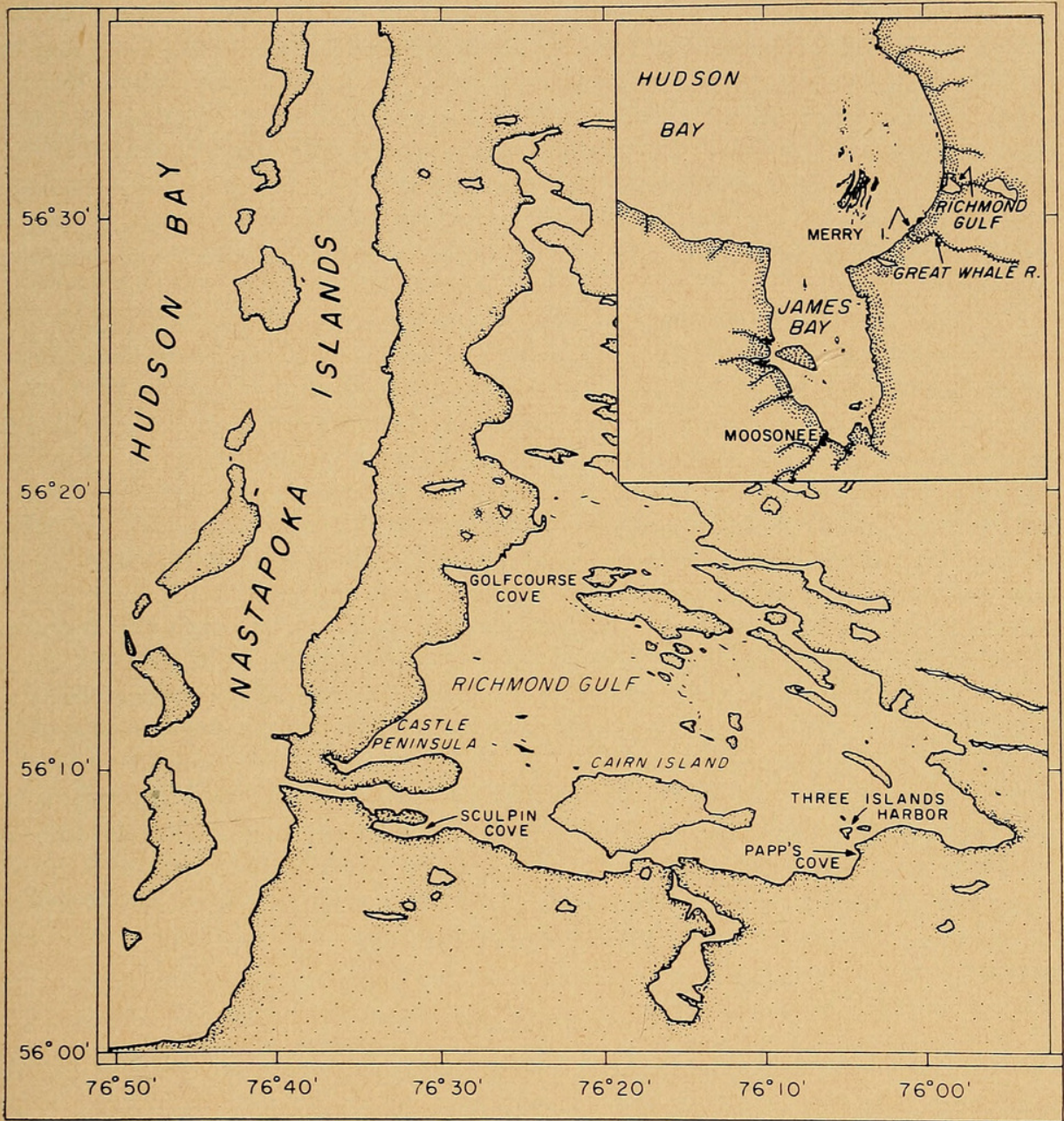


FIGURE 1. Map of Richmond Gulf area indicating localities mentioned in text.

A trapline of thirty traps was set out for two nights on the evening of August 29.

**Papp's Cove (56°06'N, 76°04'W).* This large cove in the southeastern corner of Richmond Gulf is the site of the Hudson's Bay Company store and the Roman Catholic Mission. Until 1954, a free trader, Mr. George Papp and his wife lived there. Mr. and Mrs. Papp are well known for their many kindnesses to the various investigators who have worked in and around Richmond Gulf.

Near the trading post, at the north end of the beach, was a flat, lush, grassy area. A series of broad, poorly defined terraces extended back to bare rounded hills about a mile to the rear. The level portions of the terraces were

covered with a mixture of lichens and forbs typical of the area. The slopes of the terraces had a luxuriant growth of *Betula glandulosum* which extended a variable distance out onto the terraces below. A small creek, called Beach Creek locally, bisected the terrace series. Its steep banks were covered with alder and spruce. Where the terraces adjoined the hills, spruce was usually abundant. *Larix* and *Alnus* occurred with the spruce. Some of the common flowering plants of the area were *Solidago multiradiata*, *Rhinanthus oblongifolius*, *Epilobium latifolium*, *Aster puniceus*, *Linnaea borealis* and *Cornus canadensis*.

Thirty-five traps were put out here late in the afternoon of September 23.

**Golfcourse Cove* ($56^{\circ}17'N$, $76^{\circ}30'W$). This was a large, well-developed raised beach series at the end of a cove on the western side of Richmond Gulf. The usual grass zone with *Lathyrus japonicus* following the beach gradually gave way to a typical lichen tundra admixed with *Arctostaphylos*. *Vaccinium uliginosum* and *V. Vitis-ideae*, *Tanacetum buxonense*, *Artemisia borealis*, *Salix vestita*, and *S. arctica* occurred in patches on the level portion of the terraces. The slopes of the terraces generally had considerable *Betula glandulosum* on them. On either side of the terraces, near the cliffs with their talus, various arctic forbs abounded. A small stream ran down through this terrace series with a considerable growth of alder along its bank at the lower end. While we were here, a series of bad storms made it hazardous to row ashore from the boat. As a result, only one trapline of thirty traps was run and this on the night of September 10.

**Sculpin Cove* ($56^{\circ}08'N$, $76^{\circ}33'W$). I trapped (300 trap nights) this area for several days during the 1950 trip but secured no mice. On September 25, 1953, ten traps were placed in a broad, dense growth of alder and willow along a small stream, while fifteen were placed in a relatively luxuriant growth of spruce. The traps were pulled early the following morning when we departed.

ABUNDANCE

In 1950, over 600 trap nights of effort were expended in the Richmond Gulf area, without effecting the capture of a single vole or lemming. Red squirrels were observed in fair number wherever the spruce was well developed and specimens were secured without difficulty. One varying lemming was observed running across an open area in the spruce at Great Whale River. However, the evidence of a high population the previous year in the form of carcasses, skeletons, scat piles, grass cuts, and so forth, was everywhere to be observed.

In 1953, on the other hand, the voles especially abounded and were easily captured and readily observed. The captures obtained are listed in Table 1. A comparison of these data with those of Smith and Foster (1957) for the Churchill area on the other side of Hudson Bay would suggest that the small mammals on the east coast reached a higher density more quickly, both populations being at a low level in 1950 or 1951. Although I was unable to complete the 1954 trip and repeat the small mammal survey, Chamberlin (*personal communications*) reported that the small mammals were still in evidence during

TABLE 1.—Small mammal captures with snap-traps in 1953. Trap lines visited once late at night and in morning

Species/No. trap nights	Merry Island	Three Island's Harbor	Papp's Cove	Golfcourse Cove	Sculpin Cove	Total
	35	60	35	35	25	190
<i>Sorex cinereus</i>	—	—	2	1	—	3
<i>Clethrionomys gapperi</i>	6	23	10	8	5	52
<i>Phenacomys ungava</i>	9	15	9	4	5	42
<i>Microtus pennsylvanicus</i>	2	12	8	1	3	26
<i>Synaptomys borealis</i>	6	11	2	4	2	25
<i>Dicrostonyx hudsonius</i>	1	5	—	2	—	8
<i>Peromyscus maniculatus</i>	2	—	—	—	—	2
Capture totals	26	66	31	20	15	158

the late summer and fall. It therefore seems apparent that there is no definitive four year cycle as far as the microtines, at least, are concerned.

PREDATORS

Foxes, *Vulpes vulpes*, were seen on Weston Island in the south central part of James Bay but nowhere else. A striking number of Short-eared Owls, *Asio flammeus*, and Rough-legged Hawks, *Buteo lagopus*, were observed. Every cliffside bordering on tundra or spruce harbored at least one pair of Rough-legged Hawks and their offspring. Short-eared Owls were frequently observed flying at dusk, particularly at Richmond Gulf, in groups of five or six. The owl pellets found contained the skulls and bones of *Phenacomys* and *Microtus*.

SPECIES ACCOUNTS

The following annotated list includes notes on all species observed and/or collected. No effort was made to capture all possible species in the area. We attempted, within the limitations of time, to observe what we could of the voles and lemming, and to determine their relative density.

Fleas were collected and identified by the author. To avoid straggling, each mammal species was transported and kept in separate cloth bags until the specimens could be examined.

Mean measurements are given, followed by extremes in parentheses. Standard length measurements are given to the nearest millimeter. Weight is in grams.

Condylura cristata (Linnaeus) STAR-NOSED MOLE

A skin of the star-nosed mole was obtained from Mrs. George Papp. Her eskimo dog had caught the mole the previous year behind her house. This is the most northerly record to date, although it seems reasonable to predict that *Condylura* may eventually be collected in the Fort Chimo area.

Sorex cinereus Kerr COMMON CINEREOUS SHREW

Three specimens of the cinereous shrew were collected in the Richmond Gulf area, one in the *Elymus* zone at Golfcourse Cove, the other two in the alders and dwarf birch at Papp's Cove.

Average measurements of three adults (no sex) are: total length 95 (90-105); tail 40

(37-42), hind foot 11 (11-12); weight 3.5 (1 specimen).

Mustela erminea Linnaeus SHORT-TAILED
WEASEL

An adult male weasel was collected at Papp's Cove, July 25, 1950, by Andrew, an Indian boy. It measured as follows: total length 310; tail 93; hind foot 43; testes 8; and weight 170.

Another weasel was observed the same month near a small stream where I was fishing. I had laid a sizable char behind me on the bank when the weasel appeared and attempted to make off with the fish. This, despite the fact that the fish weighed 13 pounds. The weasel retreated, squeaking angrily, when I approached.

A skull of this species was picked up in the surf at Golfcourse Cove.

Lutra canadensis (Schreber) OTTER

Seeing my labors stuffing mice, an old Indian brought me a peculiar specimen of mammal that he had prepared himself. It was made up like a museum study skin and stuffed with dried moss. He had trapped a female otter that April (1950) near Richmond Gulf and stuffed up one of the unborn young.

Phoca vitulina True HARBOR SEAL

The harbor seal was seen from time to time in Richmond Gulf, less frequently along the coast of Hudson Bay itself. It is, of course, much sought after by the Eskimos of the area for food and clothing.

Erethizon dorsatum (Linnaeus) PORCUPINE

Porcupines were not observed often although they were in evidence in the better-developed stands of trees. One specimen was collected at Sculpin Cove in 1950, a female, measuring as follows: total length 686; tail 127; hind foot 89.

Marmota monax (Linnaeus) WOODCHUCK

Several skins belonging to Mrs. Papp were examined. Indians infrequently catch woodchucks in the interior behind Richmond Gulf.

Tamiascirus hudsonicus (Erxleben) RED
SQUIRREL

During the 1950 trip we spent several days in the Sculpin Cove area, living in what remained of the Gulf Lead Mines cabin. Red

squirrels were frequently seen in the nearby spruce; it was possible to walk to within a few feet of them without their showing much fear. The squirrels spent much of their time on the ground and in burrows under and around the spruce. Middens were found infrequently and they were not especially large. We searched for but did not find any nests in the trees.

Each of the red squirrels captured carried a few fleas, *Orchopeus caedens* (Jordan) in every case.

The average measurements of two adult females are: total length 310; tail 116; hind foot 47; weight 200.

Clethrionomys gapperi (Vigors) GAPPER'S
RED-BACKED VOLE

The red-backed vole was abundant in the spruce thickets and under the denser and wetter cover of shrubs. Considering the relative proportions of the various plant communities further inland, the red-backed must have been the most abundant small rodent in boreal Ungava during the summer of 1953 if our experience was any criterion (cf. Cameron and Morris, 1951). With the exception of *Dicrostonyx* it was the only species that went consistently for the bait. The red-back did not make any obvious runs, but a trap by any likely looking hole in the moss of the spruce groves, or in a cavity under the roots of a spruce, or under a thicket of alder, birch or *Ledum*, or down deep between rocks in a cavity in the forest would get one every time.

Our first experience with this mouse was in a Hudson's Bay Company warehouse while we were outfitting the R/V *Lemming* at Moosonee. Four were taken here and only one had the typical red-back coloration. The other three were colored much like No. 6 in Bang's plate (1897), although a bit darker. All of those collected on Merry Island were normally colored. Three of twenty from Three Islands Harbor were gray-brown. All those collected behind Papp's were typical but for one completely black specimen. Of five from the south side of the terraces at Golfcourse Cove, one was dark brown and another black, while those from the talus on the north side were all yellowish brown and so different in general appearance that it was hard to believe that they were red-backs. The speci-

mens from Sculpin Cove were all typical. Most of the normally colored red-backs at Richmond Gulf had an unusually intense yellow coloration on the belly.

There was no evidence of any current breeding activity at Spruce Canyon, Papp's Cove, or Sculpin Cove. At Three Islands Harbor, the adult females were all lactating and their uteri were swollen, although none were carrying embryos. The female red-backs at Golfcourse Cove also had internal evidence of recently completed breeding, the males all had partially enlarged testes, 4 mm on the average, that were ascending or had ascended. More immatures were collected here than anywhere else. Very few mice that could be definitely assigned to the previous season were captured.

All stomachs examined contained finely chewed green plant matter, and the contents of many were colored a dark blue presumably from the berries of *Vaccinium uliginosum*. There were considerable cut pieces of *Ledum palustre* about the haunts where red-backs were trapped at Three Islands Harbor.

Trapped specimens of red-backed mice usually carried a few fleas each of two species, *Malaraeus penicilliger dissimilis* Jordan and *Monopsyllus quirini* (Rothschild).

The average measurements of 17 adults (9 males, 8 females) are: total length 162 (150-170); tail 44 (38-47); hind foot 19 (18-20); weight 37 (23-49).

Phenacomys ungava Merriam HEATHER VOLE,
PHENACOMYS VOLE

The heather vole was the commonest rodent in the particular areas we visited. *Microtus* was similarly abundant, but only in the restricted zone of grass above the shoreline. Many were caught in the talus, in hollows in the tundra and under the dwarf trees where no discernible pathways could be seen (Figure 2A). The majority were caught on the shallow, broad but not obvious runs that connected patches of cover or ran from the spruce forest out onto the open areas. A single nest containing an immature female was found under a large, flat rock a scant twenty feet from the water's edge at Three Island's Harbor (Figure 3). The voles were frequently observed during daylight hours storing the stems of *V. Vitis-ideae* in shallow burrows (old lemming burrows apparently) and under rocks in the

open flat areas, cf. Foster, 1961, p. 193 (Figure 2B). These stems, from three to six inches long, were cut at the base and stored intact, leaves, stem, berries and all. There were no nests connected with these caches. It was not apparent that the voles were interested in the berries, although they were plentiful and ripe. The stomachs examined all contained finely chewed green plant material. *Aster puniceus* was common at Three Island's Harbor, and in those areas where there were many *Phenacomys* it was usually badly cut up, presumably by this species.

The voles apparently breed through the month of August. All the males caught after this time had ascending or ascended testes. One female from Merry Island had embryos, R1L3-2 mm. Several females from this locale and from Three Islands Harbor had recently given birth. The number of truly immature individuals captured seemed unusually small, despite the fact that the voles were still breeding when we first got to Hudson Bay.

Fleas, *Monopsyllus a. asio* (Baker), were found occasionally on trapped specimens.

The average measurements of 18 adults (8 males, 10 females) are: total length 143 (131-161); tail 32 (26-38); hind foot 18 (16-20); weight 40 (29-54).

Microtus pennsylvanicus (Ord) PENNSYLVANIA MEADOW VOLE

Excluding those taken on the islands in James Bay, all the meadow mice collected may be provisionally referred to *Microtus pennsylvanicus labradorius* Bailey. The fully adult animals tend to be large, up to 180 mm in total length and weighing as much as 76 grams. Their coloration is paler than typical *M. pennsylvanicus*, homogeneous on the sides and dorsum, belly typically pale gray. There is an obvious yellow-brown spot on either side of the muzzle.

In the summer of 1953, *Microtus* was abundant everywhere we went, especially in the grassy, wetter areas. The runs were used so frequently and by so many mice that in many places they were beaten more than an inch into sandy soils (Figure 2C). In some places, where it was estimated that the numbers exceeded two hundred individuals per acre, no nests could be found. Around the buildings at Richmond Gulf, the mice occupied every discarded can and

were to be found under almost any board, under drums of gas, in pipes, in fact under or in anything that offered protection. In those places bordering on water, where a relatively narrow strip of grass was backed up with alders, the grass zone was riddled with runs, and broader runs could be seen leading into the alders. Presumably the mice had burrows and nests amongst the shrubs, but none could be found. The mice were rare or not present within the spruce forests, nor were they taken on the tundra. They were caught, however, in a most barren talus slope at Golfcourse Cove.

Meadow vole scat piles were distinctively bright green and so constantly trodden upon that the scats were coalesced into homogeneous masses. They varied in size from small piles to masses five or six inches in diameter and an inch or so thick.

Occasional specimens of *Microtus* were caught with one or two fleas on them, of the species *Monopsyllus a. asio* (Baker).

The average measurements of 10 adults (4 males, 6 females) are: total length 175 (168-195); tail 46 (39-59); hind foot 19 (19-20); ear 16 (14-17); weight 64 (53-76).

On August 13, 1953, we anchored for the night off a small island about two acres in size. The position of the island, as best we could determine, was 53°57'N, 79°25'W. It was typical of the many small islands off the coast of northeastern James Bay, being low, not over fifteen feet high, and rounded. The island was obviously washed over by water during bad storms. There were large drift logs at the highest point. Here and there in the hollows on the island, a mossy sod had developed that supported a few species of higher plants including *Matricaria*, *Potentilla*, *Agrostis* and *Carex*. Wherever a patch of sod adjoined a pool of water, well used runs were found. Three nests were located, two barely concealed by the grass and one underneath a log. The nests were

large and globular, about ten inches in diameter, and made of relatively coarse material outside with a small inner nest of finer materials.

One nest contained four approximately two-week-old *Microtus*, another, three approximately three-week-old *Microtus*, and the third, five babies estimated to be only three or four days old. When the nests were opened the older young immediately ran off, going without exception to the pools of water which they swam across with facility. When I first landed I had set out five traps. These were retrieved less than one hour later and found to contain four *Microtus*, two of which were adult females carrying embryos, R3L2-2 mm and R3L2-5 mm.

These voles were no different in coloration from those caught further north, nor did the teeth differ. With the exception of a slightly more obvious infraorbital foramen in the front view, there is nothing particularly unusual about the skulls. The ear measurement, however, was strikingly different, being two or three millimeters smaller (12-13, instead of 15-17 millimeters) than that of the mice collected further north.

Ondatra zibethica (Linneus) MUSKRAT

A muskrat was seen swimming in a small creek late at night on the west side of Richmond Gulf in 1950.

Synaptomys borealis Richardson NORTHERN BOG LEMMING

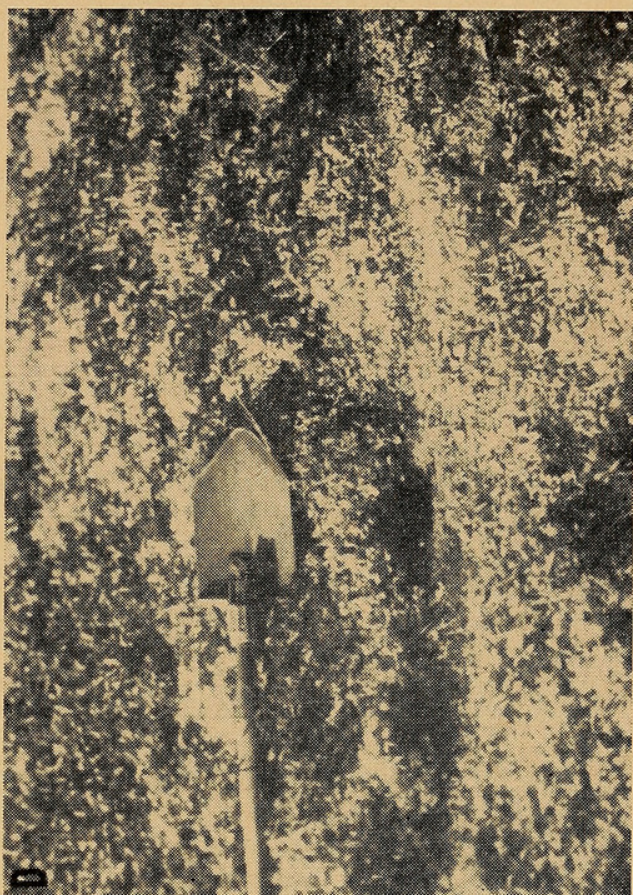
This was the least abundant of the microtines observed and captured. Within particular habitats, such as the neighborhood of water holes in the tundra, they were to be seen at any time, scurrying about on the muddy banks and chasing one another through the grass. While an occasional bog lemming was captured in the spruce or birch thickets, most were taken in the open, very wet places. They paid no attention to the

FIGURE 2A. Lichen-covered talus at Spruce Canyon where *Phenacomys* were trapped. The lack of runways, even about the entrances to burrows and cavities under boulders, is typical of those areas where *Phenacomys* abounded.

FIGURE 2B. Hole under boulder in which *Phenacomys* was storing stems of *V. Vitis-ideae*. Arrow indicates pile of stems removed.

FIGURE 2C. A typical *Microtus* run across a wet meadow. The bottom of the run itself had been beaten down almost a full inch below the original soil level.

FIGURE 2D. A typical *Dicrostonyx* burrow and its associated run on one of the beach terraces at Golfcourse Cove.



bait, being caught instead when they ran across the trap. There were no marked signs such as scat piles or grass cuttings that could be associated with this mouse.

Only two of the bog lemmings showed any signs of active breeding. One male taken on Merry Island, August 23, had fully developed and descended testes 13 mm in length. A female from Golfcourse Cove, caught September 10, carried three large embryos, R1L2-25 mm. For the most part these mice appeared to be yearlings. There were apparently two litters in the summer of 1953, the first by the adults of the previous season and a second by these adults and some of their progeny late in the season.

A very few had fleas, in every case *Monopsyllus a. asio* (Baker).

Average measurements of 19 adult specimens (8 males, 11 females) are: total length 133 (120-152); tail 20 (17-23); hind foot 18.5 (17-20); weight 31 (23-42).

Dicrostonyx hudsonius (Pallas) LABRADOR
VARYING LEMMING

It was most surprising that only seven varying lemmings were obtained by trapping. They were not common, and few were seen abroad. Several were observed traveling along runs through thickets of willow and birch at Little Whale River and one running across the tundra at Golfcourse Cove. All that were trapped were caught below the surface of the ground beneath spruce roots, in rock crevices, or in large cavities near the water holes on open areas.

Distinctive varying lemming burrows (Figure 2D) were relatively common on the terraces at Richmond Gulf and many were excavated to determine their structure, to obtain lemmings, and to examine the nests for fleas. Their burrows are quite simple as can be seen from the diagrams of Figure 3. The typical occupied burrow had a small pile of fresh dirt at the entrance. A short length of tunnel, eighteen to twenty inches, led downward to a round, somewhat flattened nest of fine grass. The nest was not obviously differentiated into an outer and inner portion. There was usually a scat pile beneath the nest. If the burrow was branched, the branch was seldom currently used for any purpose and partially filled with moldy scats. Most burrows continued behind the nest for considerable distances. If the burrow was occupied, the lemming was

always found at the extreme end attempting to dig out of danger. However, even in easily excavated sandy soil they appeared to make little headway, which may explain the simplicity of their burrows. The burrows that we observed had entrances either at the base of a dwarf willow or birch or at the foot of the beach terraces. Lemming pathways typically ran from clump to clump of shrubs and along the foot of the terraces. Each lemming apparently maintained a two- or three-burrow system inasmuch as only one animal was ever found in any one series of burrows obviously connected by runs. It would appear that the relationship between the lemmings and the other microtines was much the same as that of the woodchuck and the rabbit in north-eastern United States. Many burrows examined at Richmond Gulf appeared to have been originally constructed by a lemming, whatever the rodent species occupying them at the time.

Lemming scat piles did not have the appearance of *Microtus* or *Phenacomys* piles inasmuch as the individual scats more or less remained separate. Some scat piles easily exceeded a foot in diameter and a height of six or more inches.

All of the lemmings captured alive died within a day or two. They usually lapsed into a rigor similar to that seen in *Zapus* after they have been caught by the tail or the foot on a cold and/or wet night. While it may have been symptomatic of an approaching cyclic die-off, this does not seem likely inasmuch as we found no dead lemmings while we were in the area.

No evidence of breeding was observed.

Both lemmings and their nests were remarkably free of ectoparasites. Only a very few fleas, *Monopsyllus a. asio* (Baker), were found in the nests. The specimens from Three Islands Harbor carried a few *Monopsyllus quirini* (Rothschild) and *Malareus p. dissimilis* Jordan.

Average measurements of 8 adults (5 males, 3 females) are: total length 143 (135-152); tail 16 (15-17); hind foot 20 (18-21); weight 66 (55-85).

Peromyscus maniculatus (Wagner) WHITE-FOOTED MOUSE

Two immature specimens of white-footed mice were collected on Merry Island. These were the only specimens secured. Cameron

measured as follows: total length 205; tail 114; hind foot 32; weight 18.

Delphinapterus leucas (Pallas) BELUGA

The beluga was frequently observed from James Bay northward. This porpoise was

not seen within Richmond Gulf. However, Chamberlin reports that one beluga closely circled the R/V *Lenming* while at anchor in southeastern James Bay, late in the summer of 1954.

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A CANADIAN RESEARCH DIRECTORY

The Canadian Society of Wildlife and Fishery Biologists has produced a directory of current research in Canada in wildlife and fishery biology. Projects are listed by Province, agency, title and leader with probable date of completion. The directory contains some 705 entries which are fully indexed and cross-indexed. It is mimeographed and in ring binding so that new material can be added. Present plans are to revise the directory every two years. The directory is free to members of the Canadian Society or can be purchased for \$3.00 from the Secretary-Treasurer, C.S.W.F.B., Box 2292, Postal Station "D", Ottawa, Ontario.



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