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Editor:

ARTHUR GIBSON,

Entomological Branch, Department of Agriculture,
OTTAWA.

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NOTES ON THE WINTER BIRDS OF THE OKANAGAN VALLEY.

BY J. A. MUNRO.

In comparison with eastern Canada, the winter season of the Okanagan Valley is mild, with a lighter snowfall and a greater number of clear sunny days. In normal years the first cold weather comes towards the end of November. Between November and the first of March there are usually three or four cold snaps, when the temperature drops to ten or fifteen below zero. By the end of February the snow has melted and warm sunny days are the rule.

During the severe winter of 1915-16, zero weather lasted almost continuously from January 9th until February 4th. There was an unusually large amount of snow and Okanagan Lake was frozen over. The lowest temperature at Okanagan Landing was 24° below zero.

Along the lake shore and in the river bottoms various wild fruits, such as snowberry and rose hips insure an abundant food supply. The fruit of the Black Haw (*Crataegus douglasi*) usually dries on the bushes and is greedily eaten by Bohemian Waxwings and Pine Grosbeaks. Introduced weeds are well represented along roadsides and on waste ground. *Amaranthus retroflexus*, *Chenopodium album* and *Melilotus alba* are the commonest and the seeds form the staple diet of Sparrows, Redpolls and Juncoes.

The following notes cover the period between 1911 and 1917, inclusive.

WESTERN GREBE—*Echmophorus occidentalis*.

A few winter on Okanagan Lake.

HOLBOELL'S GREBE—*Colymbus holboellii*.

A few winter on Okanagan Lake. Both this species and the former, die in large numbers every fall. Specimens examined were in an emaciated condition and contained several species of parasitic nematodes. In several cases a mass of wire-like parasites, clustered between the leg muscles and the skin, caused the knee joints to swell to twice the normal size. A segmented tape-worm was present in several specimens.

HORNED GREBE—*Colymbus auritus*.

Winters commonly on Okanagan Lake.

RED-BILLED GREBE—*Podilymbus podiceps*.

A few winter on Okanagan Lake.

LOON—*Gavia imber*.

A few winter on Okanagan Lake.

RED-THROATED LOON—*Gavia stellata*.

A juvenal female picked up on the shore of Okanagan Lake, November 22nd, 1915. Small Loons observed on several occasions were probably of this species.

HERRING GULL—*Larus argentatus*.

Common winter resident.

CALIFORNIA GULL—*Larus californicus*.

Not as common as the former.

MERGANSERS—*Mergus americanus*.

Common resident.

RED-BREADED MERGANSER—*Mergus serrator*.

Regular winter resident.

MALLARD—*Anas platyrhynchos*.

The bulk of the surface feeding ducks, leave in November, when the small lakes and sloughs freeze over. A few remain as long as there are open stretches of water in the streams but become quite poor. Frequently mixed flocks of Mallard, Pintail, etc., are seen picking up the weeds that have become dislodged by the wind and have drifted on to the ice on the shore of the lake.

GADWALL—*Chaulelasmus streperus*.

No winter records since January 1912.

BALDPATE—*Mareca americana*.

A few remain all winter and live parasitically on the Redheads, snatching the weeds from their bills as they rise to the surface. They are in constant motion, when feeding, dashing at every duck that rises near them.

GREEN-WINGED TEAL—*Nettion carolinense*.

A few winter.

PINTAIL—*Dafila acuta*.

A few winter.

REDHEAD—*Marila americana*.

The commonest duck on Okanagan Lake in winter. Late in January, when their feeding grounds at the south end of the lake become frozen, they congregate in enormous flocks in the vicinity of Okanagan Landing. The prevailing winds are southerly and serve to keep the shallow water here free of ice. Several specimens of pond-weeds (*Potamogeton*) afford an abundant food supply. By February 15, the flocks have reached their maximum and number several thousand. They remain in these large bands until March, when they

move north. A small number remain and breed. Males outnumber females in the proportion of 15 to 1. Courtship commences about the last week in February. This is interesting in view of the fact that they are one of the last ducks to breed. I have found fresh eggs late in June and half grown young in September.

The following is from my note book:

February 28, 1916—Large flocks of Redhead close to shore, feeding and courting. Some were mated and copulating. The drake swims swiftly to the duck, and appears to seize her by the neck with his bill. The duck is at once submerged and remains so until the drake leaves her. Five drakes seen to follow a duck and surround her in a circle. They stretch their necks straight up, the front part slightly elevated, showing the black breast, the crown feathers erected. Sometimes they uttered a coarse quack before relaxing.

February 29, 1916—Large flocks feeding close to the beach. Those nearest to the shore were dipping like mallards. They bring the pondweed to the surface and after shaking it several times, swallow in a series of gulps. The mating call is a coarse quack; the wheezy cat-like cry is made when feeding. I have been unable to discover if it is made by both sexes.

CANVAS-BACK—*Marila valisneria*.

Regular winter resident, not common.

SCAMP DUCK—*Marila marila*.

Abundant winter resident.

LESSER SCAMP DUCK—*Marila affinis*.

Regular winter resident; not as common as the former.

RING-NECKED DUCK—*Marila collaris*.

Regular winter resident; unusually abundant during the winter of 1915-16.

GOLDEN-EYE—*Clangula clangula americana*.

Common winter resident.

BARROW'S GOLDEN-EYE—*Clangula islandica*.

Scarce winter resident. Breeds commonly here and leaves in October or earlier. The drakes leave soon after the eggs are laid in May. Most of the winter records are for juvenals.

BUFFLE-HEAD—*Charitonetta albeola*.

Common resident. The drakes disappear soon after the eggs are laid and are not seen again until October.

OLOR. (Sp.?)

A small flock of swans winter regularly.

COOT—*Fulica americana*.

Abundant resident. They gather in large flocks in the late fall and are loth to move south, even when their feeding grounds freeze over, in the smaller lakes. During cold winters, hundreds remain on

the ice and die of starvation or fall victims to the coyotes and bald eagles.

WILSON'S SNIPE—*Gallinago delicata*.

A few remain all winter in the vicinity of springs or along the rapid streams that remain open during the cold weather.

KILLDEER—*Oxyechus vociferus*.

One record, December 9, 1912.

RICHARDSON'S GROUSE—*Dendragopus obscurus richardsoni*.

Resident.

FRANKLIN'S GROUSE—*Canachites franklini*.

Resident in the Murray pine and spruce forests.

CANADA RUFFED GROUSE—*Bonasa umbellus togata*.

Resident. The breeding race appears to be typical *togata*. During October there is usually a local migration from the higher mountains and a much grayer bird appears, which is probably closer to *umbelloides*.

WHITE-TAILED PTARMIGAN—*Lagopus leucurus leucurus*.

Breeds above timber line in southern Okanagan. Taken in winter on the Silver Star mountain, near Vernon, by Allan Brooks.

COLUMBIAN SHARP-TAILED GROUSE—*Pedioecetes phasianellus campestris*.

Resident. Grouse of all species have become very scarce during the past two years and a close season for all of British Columbia east of the summit of the Cascade mountains was declared in 1917. The scarcity is accounted for by the ravages of an intestinal parasite coupled with two severe winters, cold wet springs and the increase of coyotes and skunks.

WESTERN MOURNING DOVE—*Zenaidura macroura marginella*.

One winter record, January 27, 1916.

MARSH HAWK—*Circus hudsonius*.

Resident.

SHARP-SHINNED HAWK—*Accipiter velox*.

Two winter records, January 24, 1913; January 3, 1917.

GOSHAWK—*Astus atricapillus atricapillus*.

Common Resident.

ROUGH-LEGGED HAWK—*Archibuteo lagopus sancti-johannis*.

Winter resident, never common.

GOLDEN EAGLE—*Aquila chrysaetos*.

Resident. Not common.

NORTHERN BALD EAGLE—*Haliaetus leucocephalus alascanus*.

Common resident.

DUCK HAWK—*Falco peregrinus anatum*.

Resident; not common.

PIGEON HAWK—*Falco columbarius columbarius*.

Resident; not common.

- BLACK PIGEON HAWK—*Falco columbarius sucklei*.
One record, February 7, 1914.
- DESERT SPARROW HAWK—*Falco sparverius phalena*.
One winter record, January 22, 1917.
- LONG-EARED OWL—*Asio wilsonianus*.
Common resident.
- SHORT-EARED OWL—*Asio flammeus*.
Common winter resident; a few remain to breed.
- GREAT GREY OWL—*Scotiaptex nebulosa nebulosa*.
Scarce winter resident.
- RICHARDSON'S OWL—*Cryptoglaux funerea richardsoni*.
Scarce winter resident.
- SAW-WHET OWL—*Cryptoglaux acadica acadica*.
Resident; not common.
- MACFARLANE'S SCREECH OWL—*Otus asio macfarlanei*.
Common resident.
- GREAT HORNED OWL—*Bubo virginianus*.
The breeding form is consistently dark with the heavily mottled feet of "*saluratus*." In the winter a much lighter, more rufescent form occurs. I have never taken anything approaching *subarcticus*.
- SNOWY OWL—*Nyctia nyctia*.
Winter resident; not common. During the winter of 1916-17, when the big migration of this species occurred on the Pacific coast, they were slightly more common here.
- HAWK OWL—*Surnia ulula caparoch*.
Winter resident; not common. Breeds in the high mountains in southern Okanagan.
- PYGMY OWL—*Glaucidium gnoma gnoma*.
Common resident.
- BELTED KINGFISHER—*Ceryle alcyon*.
A few generally winter.
- ROCKY MOUNTAIN HAIRY WOODPECKER—*Dryobates villosus monticola*. Common resident.
- BATCHELDER'S WOODPECKER—*Dryobates pubescens homorus*.
Common resident.
- WHITE-HEADED WOODPECKER—*Xenopicus albolarvatus*.
Two records, December 20, 1911; January 24, 1914.
- ARCTIC THREE-TOED WOODPECKER—*Picoides arcticus*.
Resident in the Canadian zones.
- ALASKA THREE-TOED WOODPECKER—*Picoides americanus fasciatus*.
Resident in the Canadian zone.
- NORTHERN PILEATED WOODPECKER—*Phloeotomus pileatus abieticola*.
Common resident.
- RED-SHAFTED FLICKS—*Colaptes cafer collaris*.
A few always winter.

PALLID HORNE LARK—*Otocoris alpestris arctica*.

Breeds above timber line. Arrives in the valleys in large flocks early in September. Small flocks remain through the winter, but the majority of the birds go farther south in late October.

MAGPIE—*Pica pica hudsonia*.

Abundant resident.

BLACK-HEADED JAY—*Cyanocitta stelleri annectens*.

Common resident.

ROCKY MOUNTAIN JAY—*Perisoreus canadensis capitalis*.

Resident in the Canadian zone.

NORTHERN RAVEN—*Corvus corax principalis*.

Resident in the Canadian zone.

WESTERN CROW—*Corvus brachyrhynchos hesperis*.

Abundant resident. The bulk of the crows spend both winter and summer in the brushy river bottoms in the vicinity of cleared land.

CLARKE'S NUTCRACKER—*Nucifraga columbiana*.

Resident; sometimes common. During the fall and winter they feed almost exclusively on the seeds of the yellow pine (*Pinus ponderosa*). When the seed crop is light they leave the district entirely. Very few were seen in the Okanagan from July, 1915, until August, 1917. They are plentiful again this winter (1917-18).

NORTHWESTERN RED-WING—*Agelaius phoeniceus caurinus*

Abundant resident.

WESTERN MEADOWLARK—*Sturnella neglecta*.

Abundant resident. During cold weather they frequent straw stacks, burrowing into the loose straw for warmth.

BREWER'S BLACKBIRD—*Euphagus cyanocephalus*.

In 1912-13, this species wintered in large numbers in the city of Kelowna, feeding on street refuse. I have no winter records north of this.

WESTERN EVENING GROSBEEK—*Hesperiphona vespertina montana*.

Winter resident, some years abundant. They are usually more common in the cities where the seeds of the box elder are the attraction. When the supply of seeds is exhausted, they move out into the country, feeding on the choke cherry kernels and the small black haws (*Crataegus douglasi*) that have dried on the bushes during the hot summer. In the summer of 1916 they remained in the city of Vernon as late as June 5, and were then feeding on green box elder seeds. A few pairs undoubtedly breed in the mountains close to here, as I have taken juvenals in August.

ROCKY MOUNTAIN PINE GROSBEEK—*Pinicola enucleator leucura*.

Winter resident, sometimes abundant. Breeds in the high mountains near timber line in the southern Okanagan. Winter birds are probably from the north. They gather in large flocks in the orchards, tearing the seeds out of the frozen apples. The pulp that

falls to the ground is generally eaten by Bohemian Waxwings. Frequently they feed together.

CASSIN'S PURPLE FINCH—*Carpodacus cassini*.

Three winter records.

CROSSBILL—*Loxia curvirostra minor*.

Common resident; erratic in their appearance. I have shot females in February and in August that were undoubtedly breeding.

GRAY-CROWNED ROSY FINCH—*Leucosticte tephrocotis tephrocotis*.

HEPBURN'S ROSY FINCH—*Leucosticte tephrocotis littoralis*.

Both forms breed above timber line in the Similkameen district and in the Gold Range. Large flocks come into the valley during December and January. *Littoralis* is much the more common. *Tephrocotis* occurs in the flocks in the proportion of one to twenty or thirty. Specimens that are intermediate are common. I have frequently seen flocks of three or four hundred suddenly appear and swarm over a bare place on the open range in search of gravel. When disturbed they often circle several times, their undulating flight and soft voices suggesting the shore lark. If birds have been shot out of the flock, the remainder will come back time after time, fluttering to the ground, close to the dead birds. On one occasion, a flock, disturbed from an alfalfa field, flew up, in an ever narrowing spiral, for several hundred feet and then closed into a compact flock and flew straight away.

HOARY REDPOLL—*Acanthis hornemanni exilipes*.

Rare. One was taken in a flock of *linaria* on February 24, 1912, and two specimens taken in December, 1916.

REDPOLL—*Acanthis linaria linaria*.

Abundant winter resident. The earliest date seen, November 9, and the latest recorded in the spring, March 30.

PALE GOLDFINCH—*Astragalinus tristis pallidus*.

Common resident.

PINE SISKIN—*Spinus pinus*.

Abundant resident.

SNOW BUNTING.

Abundant winter resident. The earliest record October 15, and the latest February 14.

HARRIS SPARROW—*Zonotrichia querula*.

One winter record, December 2, 1911.

GAMBEL'S SPARROW—*Zonotrichia leucophrys gambeli*.

Two specimens taken by Allan Brooks, January, 1914.

WESTERN TREE SPARROW—*Spizella monticola ochracea*.

Regular winter resident.

SHUFELDT'S JUNCO—*Junco hyemalis connectens*.

The majority of the winter Juncos appear to be typical *connectens*. In a series of winter skins sent to Dr. Dwight for identification were

also found *hyemalis* and *montanus*.

SOOTY SONG SPARROW—*Melospiza melodia rufina*.

Abundant resident.

SPURRED TOWHEE—*Pipilo maculatus montanus*.

One winter record.

BOHEMIAN WAXWING—*Bombycilla garrula*.

Usually an abundant winter resident. Flocks of three hundred or more were not unusual during the winter of 1916-17.

NORTHERN SHRIKE—*Lanius borealis*.

Regular winter resident.

DIPPER—*Cinclus mexicanus unicolor*.

Resident. When the mountain streams freeze over they can be found along the shore of Okanagan Lake. They are conspicuously plentiful at the falls on Okanagan river, where there is always open water. Here their song can be heard even on the coldest days.

WESTERN WINTER WREN—*Nannus hiemalis pacificus*.

Resident. There is a local migration from the mountains in the late fall. This is one of the species that suffered severely in the cold winter of 1915-16.

WESTERN MARSH WREN—*Telmatodytes palustris plesius*.

A few usually winter.

ROCKY MOUNTAIN CREEPER—*Certhia familiaris montanus*.

Resident in the Canadian zone. Common winter resident lower down.

ROCKY MOUNTAIN NUTHATCH—*Sitta carolinensis nelsoni*.

Abundant resident.

RED-BREASTED NUTHATCH—*Sitta canadensis*.

Abundant resident.

PYGMY NUTHATCH—*Sitta pygmaea pygmaea*.

Common resident. Not as widely distributed as the other two species.

CHICKADEE—*Penthestes atricapellus atricapellus*.

Abundant resident.

MOUNTAIN CHICKADEE—*Penthestes gambeli gambeli*.

Abundant resident.

COLUMBIAN CHICKADEE—*Penthestes hudsonicus columbianus*.

Resident in the spruce forests of the Canadian zone. I have never known them to descend to the pine and douglas fir country lower down the mountains. They travel in smaller bands than other Chickadees and keep to the tree tops. Their note is finer and more sibilant and is easily recognized.

WESTERN GOLDEN-CROWNED KINGLET—*Regulus satrapa olivaceus*.

Common resident.

SITKA KINGLET—*Regulus calendula grinnelli*.

One winter record, December 29, 1913.

TOWNSEND'S SOLITAIRE—*Myadestes townsendi*.

Common resident. In the winter their favorite food is the berry of the western red cedar. They remain all winter in the rough broken country of canyons and slide rock, where this dwarf cedar grows, and it is a wonderful experience to hear several males singing their clear sweet song, in these surroundings, when the temperature is at zero.

WESTERN ROBIN—*Planesticus migratorius propinquus*.

A few usually winter.

VARIED THRUSH—*Ixoreus naevius naevius*.

Resident. There is usually a local migration from the mountains in October.

WESTERN BLUEBIRD—*Sialia mexicana occidentalis*.

Five wintered in the city of Vernon in 1915-16. They were seen feeding on virginia creeper berries. These birds were probably frozen in the cold weather that came in January as they were not seen after December 31.

INTRODUCED SPECIES.

BOB-WHITE—*Colinus virginianus virginianus*.

Introduced some years ago. The winters are evidently too severe, as there has been little increase.

CALIFORNIA QUAIL—*Lophortyx californica californica*.

Introduced in the vicinity of Penticton and south, where they have rapidly increased.

RING-NECKED PHEASANT—*Phasianus torquatus*.

Introduced some years ago. Is now common from Summerland to the boundary.

EUROPEAN PARTRIDGE.

This species has recently made its appearance in the vicinity of Penticton, coming from Washington State.

ENGLISH SPARROW—*Passer domesticus*.

Well established in all the towns in the valley.

NOTES FROM THE JOURNAL OF WILLIAM POPE.

(Continued from page 62).

before we arrived at New York they were in great numbers, and the weather was particularly fine. We saw several other sorts of birds; gannets, the white gull and other gulls, the tern, several divers, and ducks; the white gull we had nearly every day quite in the midst of the ocean. These birds must fly a very long distance as they lay their eggs in the clefts of the rocks. Several small flocks of some species of sandpiper were also seen. One of the smallest species of that bird came flying around the ship one day, at least 300 miles from land and seemed much exhausted. We found a great source of amusement in

looking at the various sorts of sea birds we met with, and also the fish. The greatest of the latter we saw was the Grampus, a species of whale. We saw a great many of these fellows, one day especially, May 3rd, about $40\frac{1}{2}^{\circ}$ latitude and 62° and 64° longitude. They were skipping about, throwing out water in clouds. We also saw many porpoises. These latter are very amusing; they follow one another in the water like a pack of hounds or a string of wild geese, rolling and tumbling along over the surface of the water. We did not catch any fish except one cod and one dogfish as the weather was too rough and we were driven too low down to the southward. Every night we had those beautiful sparkling phosphorescent appearances in the sea. Sometimes they were more bright and in greater quantities than other times, the water appearing sometimes full of fire.

May 1st, 2nd and 3rd were very fine, beautiful, clear, pleasant days, and we now began to look anxiously forward to a speedy and safe arrival at our much desired haven.

May 5th. It was very fine to-day. About twelve it fell away to a perfect calm and we prepared our line with the intention of catching some fish, but just as we got them ready the breeze sprung up again favorably and we again went on our way rejoicing, although we lost the opportunity of getting some fresh fish for dinner. One of the steerage people caught a cod, and a dogfish. I observed on this day a brown butterfly about thirty miles from land. It is very delightful after being cooped up in the narrow limits of a vessel for the space of five or six weeks and sailing upon the fathomless deep, to arrive once more in soundings, to see the line thrown out, to hear the cheering voice of the man in the chains, giving out the exact depth of the water, now "by the ma-r-k seven," and then "and a h-a-l-f six" growing less and less at every successive cast.

It is very delightful to see the color of the water changed from the dark blue of the main ocean, to the yellowish tinge of the shallower waters girting the sea coasts, to see quantities of sea weed floating by and many birds that never wander far from land, sure indications that the vessel is approximately towards the end of her voyage. Joy gladdens every heart, smiles appear upon every countenance, from the veriest landsman in the ship, to the oldest and fearless sailor: all alike are moved by the cheering knowledge of being within one day's sail of the looked for port and with a favorable wind diminishing the distance that separates us from the shore at every successive moment. All this is heightened and increased tenfold, by the pleasure of hope and imagination, if the voyager (as most of us were) is bound to a quarter of the globe he has never been before, to other climes and other countries, where many things that meet his observation are totally new and novel, and all are interesting.

May 6th. With a steady gentle breeze and the ship under easy sails, expecting every instant to make the land, as we were then and had been all the morning running parallel with the shore, a man, being sent up to the mast head, made known at last about four o'clock in the afternoon the joyful news that land was distinctly visible upon our larboard quarter, bearing west and north-west. This was hailed with delight and satisfaction by all on board, and every eye was immediately directed to that quarter until at length arising above the horizon the shore was seen by all. It proved to be the highlands of Neversink, part of the coast of New Jersey. This was the first part of America that I had ever seen. We sailed alongside the shore till about twelve at night, when we laid to, fired our swivel, and burnt blue lights for the purpose of bringing a pilot to us. After waiting a few hours one came, and carried us safely into Sandy Hook, when we cast anchor.

It was an unpleasant misty morning and about the middle of the day, it came on to rain, but notwithstanding these untoward circumstances we all thought that the land and houses, the Island of Staten on one side and part of Long Island on the other, the trees and shrubs just appearing in their spring array, the fruit trees breaking out into full blossom, never had been more beautiful and verdant, or so pleasing and interesting before. In the course of the day, which was the 7th May, our vessel lying about three or four miles from the city of New York, a steamboat came alongside and carried all those that were ready and willing on shore. Our ship did not get into dock until the next morning.

I had no time for making observations upon first landing as the rain poured down in torrents, obliging me to steer directly for the nearest inn or hotel. In the latter part of the day the weather cleared up, the sun came out, and I immediately proceeded to take a stroll through some parts of the city. I was much disappointed with the appearance of the streets, for they were pretty generally covered with a thick mass of dirt, mud, and filth. A bad custom they have also of placing casks, packages, and all kinds of goods, upon the pavement in front of the shops or stores as they are here called, scarcely leaving sufficient room for the public to pass.

(To be continued).

THE MEADOW MOUSE OR VOLE.

BY J. DEWEY SOPER, PRESTON, ONT.

Perhaps among the smaller mammals, few are known so well, at least superficially, as the common meadow mouse or vole (*Microtus*), the form common to and occurring over Ontario entire, being *Microtus pennsylvanicus*. The voles are widely distributed and offer

exceptional opportunities for study, owing to their abundance, and to the fact that they do not burrow but remain above the ground.

They are thick, low set animals, of a dark brownish color, darker over the back, caused by the glossy guard hairs, becoming lighter on the sides and reaching their extreme paleness on the under parts. Their legs are short and sturdy, the eyes normal, the ears are small*, and the tail is short, but seldom if ever shorter than the hind foot. Their average size, taken from many specimens in my collection, is the following: Length, 144 mm.; tail, 37½ mm.; foot, 20 mm. All of these characters are, however, subject to variation and slight departures, at least, can be expected.

The above species is very closely related to those of the genus *Synaptomys* and *Phenacomys* but its certain identity is made possible by constant and distinct cranial and dental characters. An important difference, and one most readily appreciated, if the skull is available, is the formation of the teeth. In *Synaptomys* the upper incisors are grooved, while the lower incisors are rooted on the inside of the molars and terminate opposite the posterior molar. *Microtus*, on the other hand, has no grooves on the upper incisors, and the lower incisors cross the line of the molar series between the second and third molars and terminate in the ascending ramus of the mandible behind the posterior molar. This and the preceding genus have in common, rootless molars. *Phenacomys* has upper incisors ungrooved similar to *Microtus*, but the molars in contradistinction to the latter are rooted.

The genus *Microtus* enjoys a circumpolar distribution and ranges over its entire area, Old and New World, from the tropic's edge to the northern-most fringe of mammalian life. The species (*Microtus pennsylvanicus*) is, however, peculiar to America, and the animal we know so well throughout Ontario.

This vole becomes at times a menace to agricultural interests, as it is a prolific breeder, bringing forth three or four litters of young a season, with from four to eight young to the litter. Scarcely a month from April to September but nests of young have been found, and when a region becomes over-run they migrate over to other parts of the country, giving rise in years of abnormal increase to "vole plagues" which are so devastating to crops the country over. They are truly the most destructive of all small animals. Their tastes, while essentially vegetarian, sometimes, no doubt, become carnivorous, as they may readily be trapped by means of a meat bait.

They naturally love the low meadows and grass lands where rank vegetation flourishes, giving them the seclusion they seek. Here they drive their intricate system of runways and tunnelings over the ground, forming a perfect maze of passages, running in all directions, crossing and recrossing.

*In the summer the ears are longer than the fur; in the winter the longer fur conceals the ears.—C.G.H.

It often appears that they are even more industrious in this regard during the winter than during the summer; as in the former case the wonderful network of passages to be seen in the spring when the snow disappears, gives one some idea how industrious these little mammals must be under the blanketing snows. Here in the dim, ghostly light of their subterranean quarters far beneath the snow, in the wintry stillness, one cannot help but picture them scurrying to and fro, from point to point, feeding a little here and there as fancy dictates, upon the roots and stems of the abounding vegetation. And a warm nest of dead grass blades and fibres somewhere in the maze, in which to curl when the cold is intense, and possibly many in one nest cozy and warm.

Sometimes when the snow is not deep their tunnels reach the surface and here in a brief scamper across the snow, they make their way to another tunnel and disappear. These passages over the snow are never of great length, as a rule not exceeding two or three feet, and wisely so, no doubt, for they instinctively feel that a "bolt from the blue" might suddenly end their worthless careers.

Along the banks of ditches and creeks facing the south especially, where the grass is rank, they often have beautiful little tunnels constructed through the growth, leading to a pocket in the bank, completely arched over by vegetation, where they sit and feed. By lifting up the thick growth in these places, one often sees these small temporary dwellings where the mice feed and play. Often a thin deposit of excrement completely covers the floor of these miniature caverns, indicating a prolonged use by the mice for purposes of feeding and retirement.

During the summer they are not so much in evidence, due partly to a more even diffusion of individuals over fields and meadows and also to the fact that the constantly growing vegetation for a certain period, erases the more prominent runways, as seen in winter and spring, but even so their presence may be detected if sharply looked for.

A favorite place at all times is the old fence lines or bottoms, stone piles, decaying rail heaps in dense grass and all similar places. Here they build their nests and rear their young during the warmer months. Oftentimes the nest is cunningly constructed in a hollow cup in the ground or the base of a sheaf in a stook left in place for some time. The nest itself is of neat design and is completely arched over similar to an Ovenbird's nest, but constructed of lighter materials, mostly fine grass blades and plant fibres, with a small almost imperceptible opening on one side, leading to the warm, soft, spherical, interior. The outside dimensions vary, but would probably average about six inches, the interior about three inches in diameter.

The vole has many natural enemies and well it is that Nature has provided for a proper balance in this matter. Among these

enemies are the weasel, mink, skunk, foxes, hawks, and owls. At best a mouse leads a rather erratic and uncertain life and possibly is comparatively short-lived.

A WELL-EARNED HONOUR.

Dr. C. Gordon Hewitt, F.R.S.C., Dominion Entomologist and Consulting Zoologist, of the Department of Agriculture, Ottawa, has been awarded the Gold Medal of the Royal Society for the Protection of Birds, and at the same time was elected an Honorary Fellow of the Society "in recognition of eminent services to the cause of bird protection" in England and Canada. There are but eleven other Honorary Fellows of the Society in different parts of the world. In announcing the award at a recent meeting of the Society in London (England), Mr. Montague Sharpe, Chairman of the Council, recalled the practical support that Dr. Hewitt gave to bird protection before leaving England in 1909 and referred to the many ways in which he had furthered it in Canada, particularly in connection with the treaty between Canada and the United States for the protection of migratory birds. Before coming to Canada, when in charge of the Department of Economic Zoology of the University of Manchester, Dr. Hewitt organized and was secretary of the Economic Ornithological Committee of the British Association for the Advancement of Science and of the Board of Agriculture, which committee of scientific workers undertook the investigation of the economic status of birds in Great Britain and Ireland. He also carried out in the Lake District the protection and encouragement of birds on an extensive scale as a practical measure for the first time in England. His work in promoting bird protection in Canada is well-known, and particularly his efforts to secure the interests of the young and of the people in town and country in the encouragement and protection of birds. At the recent annual meeting of the Commission of Conservation he pointed out that never was the need of bird protection more urgent than at the present time, as birds were our best allies in controlling the innumerable pests that destroy our food crops which are now so vitally essential.

BOOK NOTICE.

RURAL PLANNING AND DEVELOPMENT:—The latest report of the Commission of Conservation deals with the important subject of the planning and development of rural districts and small towns in Canada. It has been prepared by Mr. Thomas Adams, Town Planning Adviser of the Commission, who has made a close study of the

problems of rural development in this country during the past three years, following twenty-five years experience in farming, land surveying and town planning in other countries.

The report deals comprehensively with the social conditions and tendencies in rural areas and the prevailing systems of land settlement and development. It indicates the rural problems requiring solution in order to secure the proper development and economic use of land for purpose of efficiency, health, convenience, and amenity. The great injury which land development in Canada suffers, from speculation, neglect of public health, and want of expert business administration of land settlement, is considered. Incidentally, the problem of returned soldiers is dealt with, and the connection between land development and such questions as taxation, unemployment, and high cost of living is clearly shown.

Having regard to the need for more attention being given to production in Canada; to the extent to which production is impaired by speculation in land, by neglect of public health, and by haphazard systems of development; to the importance of increasing the supply of human skill and energy and of capital derived from production instead of by borrowing; the problems dealt with in this report are of vital and current interest to the people of this country.

There are five appendices by competent authorities, and the concluding chapter gives an outline of proposals and makes general recommendations to cover the conditions as presented.

NOTES.

A Club in Boston has for its object the study of mushrooms, for their scientific interest, for their beauty and for their attractive qualities as food. Through the summer and autumn the club has an exhibition of mushrooms once a week at which a number of members come together to compare and identify their fresh collections. Fifty to a hundred kinds are sometimes exhibited. The Club has a large collection of dried mushrooms which are sometimes exhibited in the winter and it has a library of mushroom handbooks and journals. Poisonous species are shown and much pains taken to make them known so that they can be avoided. Membership in the Club is not confined to residents near Boston, and correspondence is carried on with those living at a distance. Persons interested in mushrooms can obtain further information from the Secretary, Miss Jennie F. Conant, 26 Prospect St., Melrose, Mass.

Just as the war in Europe forced a large part of the traveling American public to become more familiar with its own fair land, so has the world conflict been largely instrumental in causing the manufacturer of artistic commodities to look about him here at home for suggestions as to new designs. Notable success in this use of Museum material by industries has recently been made by the American Museum of Natural History in New York.

Now comes the Museum of The Geological Survey of Canada, at Ottawa, with a programme for developing distinctive Canadian designs and placing in the hands of Canadian manufacturers native designs for introduction into their products.

The wealth of material in our American museums, which has not been drawn upon to suggest designs for fabrics, ceramics, jewelry, costumes, etc., is just beginning to be appreciated by a few enterprising manufacturers.

We learn from Nature that the late Lord Justice Stirling's herbarium, consisting chiefly of about 6,000 varieties of mosses and liverworts from many parts of the world, has been presented by Lady Stirling to the Tunbridge Wells Natural History Society.

THE PROVINCIAL MUSEUM AND THE HALIFAX DISASTER.—Mr. Harry Piers, Curator of the Provincial Museum at Halifax, has replied to an inquiry regarding the relation of the explosion to the Museum. The specimens and labels apparently came through fairly well, better than was expected, considering the unbelievably terrific and astonishingly loud explosion which demolished the Richmond section of Halifax, although windows were blown in, glass of cases smashed, a water pipe burst, and snow stormed into one end of the building. Mr. Piers calls attention to the good results of always using water-proof ink for labels.

The cases were boarded over soon after the explosion in order to use them as tables for Red Cross and other relief supplies, so that a very long or careful examination of the damage has not been made. The publications are in a considerable mess, but probably have not suffered greatly. At the time of writing Mr. Piers had been too busy on relief work to examine into details of the Museum.

Mr. Pier's immediate family escaped injury from window glass which shot across the breakfast room as if from a gun less than half a minute after they had left the table. Hardly a window was left in the house and plaster came down, although the house was two miles from the explosion. His mother's family, living at the head of the North West arm, escaped with numerous small cuts from glass, none of them serious.

HARLAN I. SMITH.

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