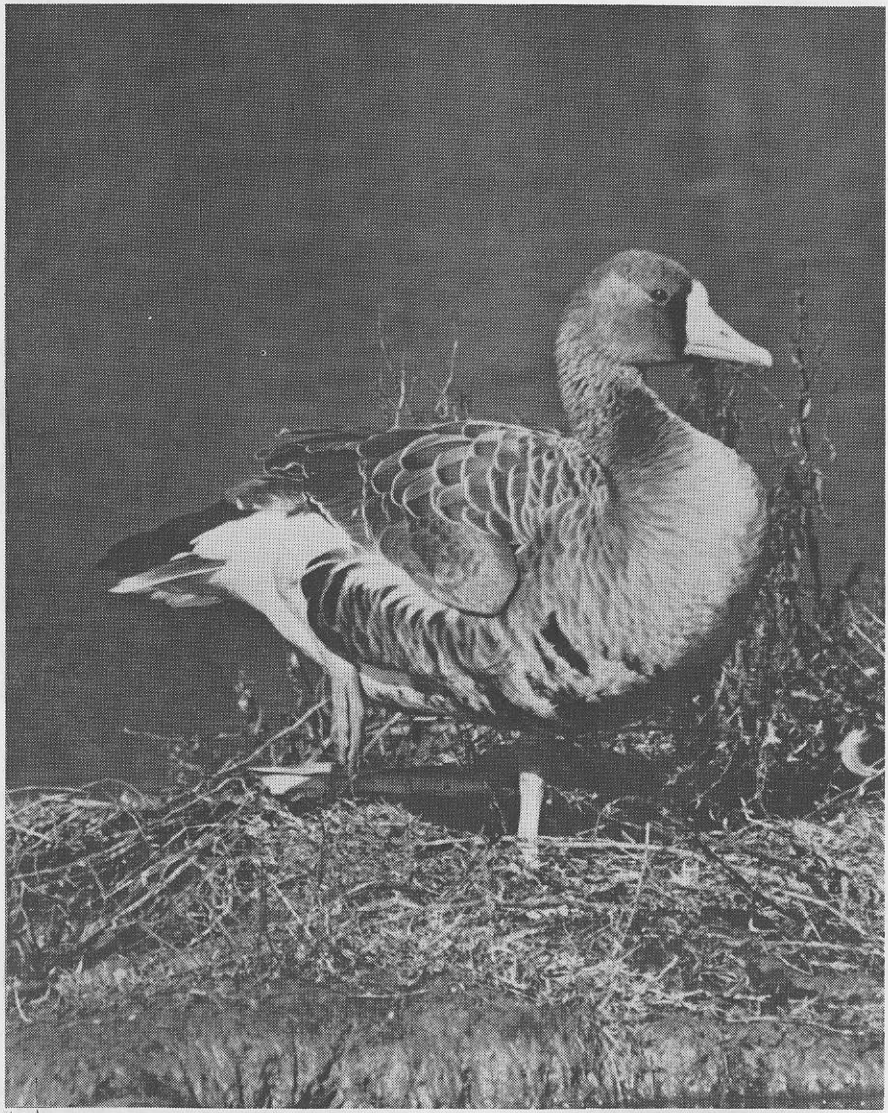

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OF BATS AND MOTHS

by Robert H. Carcasson

There are almost 800 species of bats in the world. They are everywhere in the tropical and temperate regions of the globe and one species has even reached New Zealand, where it is the only indigenous land mammal. The most primitive bats occur in the tropics of the Old World; these include the huge Flying Foxes of Asia and Australia. The vision of these large bats is good, they have no echo-locating devices and feed principally on fruit. Other bats, especially in tropical America, feed on the nectar of flowers, suck the blood of larger animals (Vampires), or capture small vertebrates, including even fishes.

The vast majority of bats however, make a living by hawking for insects at night. They are almost blind but are able to locate their prey by emitting high-pitched squeaks which are bounced back as echos from nearby objects. Bats are equipped with variously shaped sensory organs in the ears and on the nose which enable them to perceive the faintest echo from their squeaks and apparently to judge the nature, distance and direction of the object causing the echo. They are thus able to pursue insects in flight and to avoid obstacles; they have even been known to fly between the blades of a rotating electric fan without suffering injury.

COVER: White-fronted Goose

Photo by HAROLD HOSFORD

Thirty-eight species of bats are known in North America, a dozen or so of which occur in British Columbia. All our species feed on insects and are obliged to spend the winter in hibernation in caves, old abandoned buildings, or hollow trees. The Red Bat (*Lasiurus borealis*) is an exception and moves to the southernmost United States every winter; during these long flights it is occasionally seen many miles at sea. Other bats are also known to migrate but little is known of such seasonal movements, and it is believed that the echo-locating organs may assist navigation.

Moths are by far the most abundant night-flying insects and form a major part of the diet of bats. There are well over 100,000 species of moths in the world and over 2,000 are found in British Columbia. Moths have a number of defences from predators: some are poisonous or distasteful, others fly late or very early in the season when the nighthawks are in their winter quarters and the bats are hibernating, while a third group are able to hear bats and to take appropriate evasive action.

Two of the largest and most important moth families, the Owl-Moths (*Noctuidae*) and the Inch-worms *(Geometridae)*, have paired hearing organs placed below the body, at the base of the abdomen, or at the posterior segment of the thorax. These organs, known as tympani, consist of a cavity (tympanic chamber) with its opening sealed by a membrane capable of vibration and connected to a sensitive organ (tympanic sensilla) which is attached to the tympanic nerve.

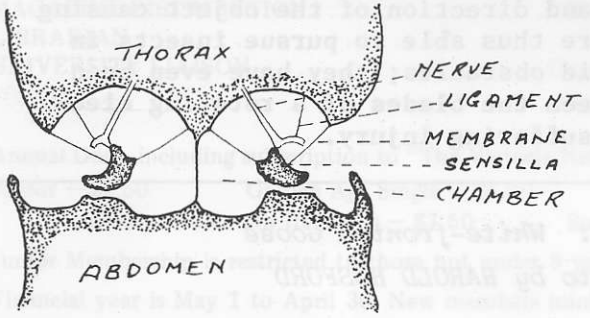


FIG. 1

Horizontal section of the tympani of an Owl-moth (after A.D. Imms, 1957)

Much experimental work has been done by Prof. K.D. Roeder on the interactions of moths and bats. He has shown that Owl-moths are able to hear the echo-locating squeaks of the bats and promptly to dive to the ground, thus evading the bat. If the tympani are removed, or sealed, the moth does not respond to the bat squeaks and is easily captured.

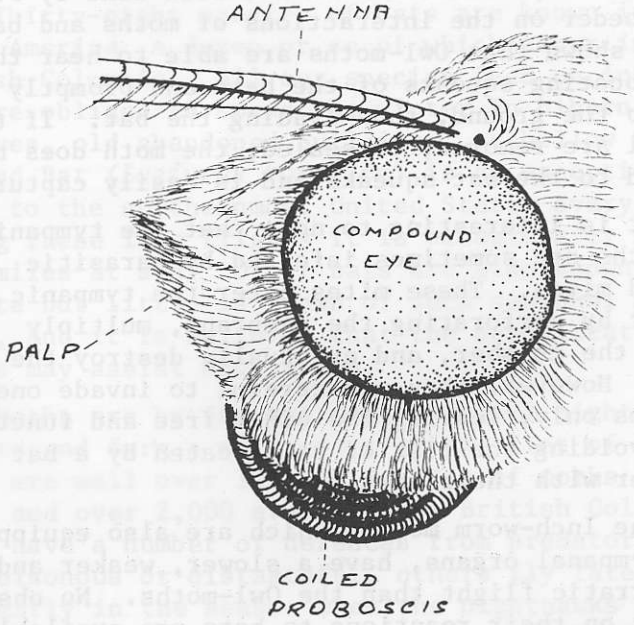
It is interesting to note that the tympani of Owl-moths are sometimes infested by parasitic Gamasid mites. These mites enter the tympanic chamber by perforating the membrane, multiply within the chamber, and eventually destroy the organ. However, they are careful to invade one tympanus only, leaving the other free and functional, thus avoiding the risk of being eaten by a bat together with their host.

The Inch-worm moths, which are also equipped with tympanal organs, have a slower, weaker and more erratic flight than the Owl-moths. No observations on their reactions to bats are available, but their discarded wings are more numerous in areas patrolled by bats than those of Owl-moths, suggesting that their defenses are less efficient.

Hawk-moths (*Sphingidae*) have no tympanal organs, but one group which includes the familiar Lined Hawk-moth *(Hyles lineata)* and the Bedstraw Hawk-moth *(Hyles gallii)* of North America and British Columbia, have a large bladder-like surface on the inside of the palps (mouth parts). These moths have also been shown to be able to evade bats by Prof. Roeder. If the palps are removed, they promptly fall prey to the bats.

FIG. 2 (top of next page):

Lateral view of head of a Hawk-moth *(Hyles sp.)* (after R. Carcasson, 1968)



As we have seen earlier, some moths avoid predators by being highly distasteful or poisonous. Such moths generally advertise their unpleasant properties with bright colours, a bold, easily remembered pattern and slow, deliberate flight. Naturally enough, they are mostly day-flying species, but a few inedible Tiger-moths *(Arctiidae)* and Tussock-moths *(Lymantriidae)* are nocturnal. They are shining satiny white or pale yellow, which are colours most easily seen at night. This affords them protection from nightjars, toads, frogs, and any other nocturnal predators which hunt by sight, but is of little value against bats. Nevertheless their discarded wings are never found on the ground below areas regularly patrolled by bats and one can assume that they are somehow avoided. It is not known, however, whether these moths are taken by the bats and immediately rejected without being harmed, or whether there is something in their texture which affects the quality of the echo and is communicated to the bat from a distance.

BIRD REPORTS

by Michael G. Shepard

Where do all the vultures come from? Could there be several hundred nesting on Vancouver Island? Do they migrate west from the Interior, then south? Maybe some birds move up from the United States after breeding. Who knows -- any of these alternatives are feasible. The latter possibility comes to mind in light of a September 23rd report of BLACK VULTURES. Derek O'Brien and Victoria Maitland found two of these southern scavengers feeding on pieces of an old road-killed fawn near Heriot Bay, Quadra Island. Perhaps we should set up a network of vulture watchers next fall to trace the movements of Turkey Vultures over Vancouver Island.

On September 29th, Terese Todd spotted a small flock of sparrow-sized birds feeding along piles of drift seaweed at the tip of Coburg Peninsula, Esquimalt Lagoon. She noted the birds teetering like Spotted Sandpipers, and identified them as NORTHERN WATERTHRUSHES. Although this species is quite common in northern B.C., it is a casual transient along the Coast.

Other noteworthy sightings included:

SHORT-TAILED SHEARWATER - 1 between Cleland Island and Amphitrite Point on September 1st (Wayne Campbell)

ANNA'S HUMMINGBIRD - male and female at 2600 Penrhyn Street (Bob Mackenzie-Grieve). The male was displaying on September 26th. In California, this species nests in winter - why not up here, too!

OLIVE-SIDED FLYCATCHER - 1 at Beacon Hill Park on September 23rd (Peggy Goodwill) - very late

Please send any interesting October bird sightings to me at the Birds and Mammals Division, B.C. Provincial Museum, Victoria, B.C., V8W 1A1, by November 10th.

REPORT ON THE PINK ERYTHRONIUM

Last spring an exchange of letters took place between Doug Turnbull and A. Brookman Anderson, Manager, Forestry and Lands, Rayonier Canada, on the subject of the pink erythronium and the prospects for its future at Sutton Creek near Honeymoon Bay. Because this subject is of such concern to many of the Society's members, the pertinent parts of these letters are reprinted here for your information.

On May 4, 1976, Doug wrote:

"I was glad to have an opportunity to mention to you the interest of the Victoria Natural History Society in the stand of pink erythronium on Sutton Creek near Honeymoon Bay. Rayonier is to be highly commended for setting aside this area as a preserve and many people visit it each season to enjoy the unique showing of these beautiful flowers. Our only concern is for the permanence of this arrangement if there should be changes in your management or perhaps even in your corporate structure.

I hope that you will keep in mind our continuing interest in this area."

On May 14, 1976, Mr. Anderson replied:

"I can understand and to a degree share your concern for the permanence of the Wildflower Preserve at Honeymoon Bay. As the years progress, there will be changes in the management of this company, and the present management cannot speak for them or for

the future. However, I can assure you there will be no change while the present management exists and it is likely this policy will continue into the future. I believe the greatest danger lies in some new and different pressures (economic or otherwise) that may develop in the years ahead.

The best way to maintain the Wildflower Preserve is by continuing contact between our company and your Society. In this way, the importance of the preserve and the desirability of retaining it, which the present management recognizes, will not be as likely to fade away as might otherwise be the case."

Which, I guess means "Nothing is Forever". Still, for the present, this looks like as good an arrangement as we can get.

IN THE MIST AT ESQUIMALT LAGOON

by Merle Harvey

It was a beautiful morning when we arrived at the Fort Rodd Hill carpark and were greeted, almost individually, by Charlie the tiny tame deer, looking for leather straps to chew.

When Tim Murphy subsequently led about 30 of us down to the beach, we found a light mist over the blue water. However, despite the mist, we made out a Red-throated Loon in summer plumage, several Marbled Murrelets, Horned, Western and Red-necked Grebes, a murre, and a few Harlquins. There was also a heron that flapped across the water and a Kingfisher that scolded us.

While watching the Horned Grebes diving within a few feet of us at the entrance to Esquimalt Harbour, a different kind of "diver" sailed past - a United States submarine.

Along Cobour Spit the air was clearer and shorebirds were common - yellowlegs, Killdeer, Black Turnstones, a Black-bellied Plover and a Spotted Sandpiper were among those that fell to our glasses. There were also several Pelagic Cormorants, a Double-Crested Cormorant, and Surf and White-winged Scoters. There also, in full summer plumage, was a Common Loon and Bonapartes, Mew, Glaucous-winged and California Gulls.

Among the trees, we got a flicker, chickadee, Golden and Ruby-crowned Kinglets, a busy creeper, a nuthatch and several Band-tailed Pigeons.

Lunch was eaten by the sea at Esquimalt Lagoon with logs as seats and backrests. Here we added a female Pintail, an oystercatcher, two adult Mute Swans with six juveniles, a Common Merganser, a Sanderling, two Semi-palmated Plovers and a Pectoral Sandpiper. Also seen were Savannah and White-crowned Sparrows.

A couple of Ravens were discovered in a tall tree across the Lagoon and crows and starlings among the gulls on the islands. A rabbit scuttled into cover and a late Mylitta Crescent spot butterfly flitted among the yellow masses of Gumweed. Some fungi were seen too.

The highlight of the day was a flock of about 50 Water Pipits, first seen at Fort Rodd Park, and then smaller flocks straggling along the Lagoon beach.

The water was beautiful, in brush-strokes of blue, green and purple on a mirror-smooth surface; and the sun shone softly through the mist.

Truly a day to remember.

CHRISTMAS BIRD COUNT

It's official! Saturday, December 18, is the big day; the Christmas Count Day. Alf Porcher will be doing the honours this year; he's the co-ordinator. Mike Shepard, Tim Murphy and Harold Hosford are his helpers.

Alf and his boys are hoping to hear from all those who took part in last year's Count, particularly the area leaders, and also from anyone else interested in taking part in this, the biggest birding event of the year. Call Alf at 477-7777 and leave your name.

Oh, yes; the after-the-event, get-together will be at the Turnbulls this year; at 3614 Cadboro Bay Road. If you plan to attend, call Elsie Turnbull at 592-6025 and see what is needed in the way of refreshments.

HILLSIDE SHOW A SUCCESS

Ruth Chambers, organizer of the Society's display at the Hillside Shopping Center on October 8, 9, and 10, reports that it was once again worth the effort. Ruth doesn't measure that success so much by the money taken in, as by the interest of the people who stopped to talk. She thinks that we'll be hearing from many of them at future meetings.

Ruth is particularly grateful to those members of the Society who helped with the show. She was almost staggered by the enthusiastic reception she received when she approached people to help.

But Ruth's fondest memory of the event was the face of a five-year-old boy who, despite his mother's efforts to lead him elsewhere, returned time and time again to, as it seemed, commune with those beautiful birds on display. Ruth said he seemed to have established a rapport with the Barn Owl that had to be seen to be believed. The boy would stand quietly beside the stuffed bird, looking intently into its eyes and seeing something there that few of the rest of us will ever see again. The look on that boy's face made Ruth's day.

FALL FASHIONS FOR CANADA GEESE

Canada Geese - the tiny Aleutian variety at least - are heading south this year sporting the latest thing in colourful fall creations by the U.S. Fish and Wildlife Service: green, orange, blue, and yellow leg bands and grey, plastic neck collars. While these colours may seem far from the traditional fall garb of these little geese, they could be the means whereby the Aleutians will be removed from the list of endangered species.

Formerly breeding on several of the islands in the Aleutian chain, the Aleutian Canada Goose has now been reduced to one small population - about 1000 birds - nesting on one small island - Buldir. This population survives on Buldir because the island has no Arctic Foxes. Other islands which formerly held nesting geese lost their geese when Arctic Foxes were released there several years ago in an effort to stimulate a fur-trapping industry. The industry foundered for lack of interest, but the foxes thrived - at the expense of the geese.

Until two years ago, the wintering grounds of these little geese were unknown, but thanks to a banding program similar to that which took place this year, the Aleutians are now known to winter in central California.

Now, biologists trying to fortify that thin line between survival and extinction are expanding the breeding range of the Aleutian geese. This involves studying the wild birds at Buldir (banding is the major tool in this study), removing alien predators (the foxes) from selected islands, developing a captive flock of geese acclimatized to the Aleutian Islands and available for release on safe islands when they mature, and providing safe sanctuary for the migrating birds on their wintering grounds.

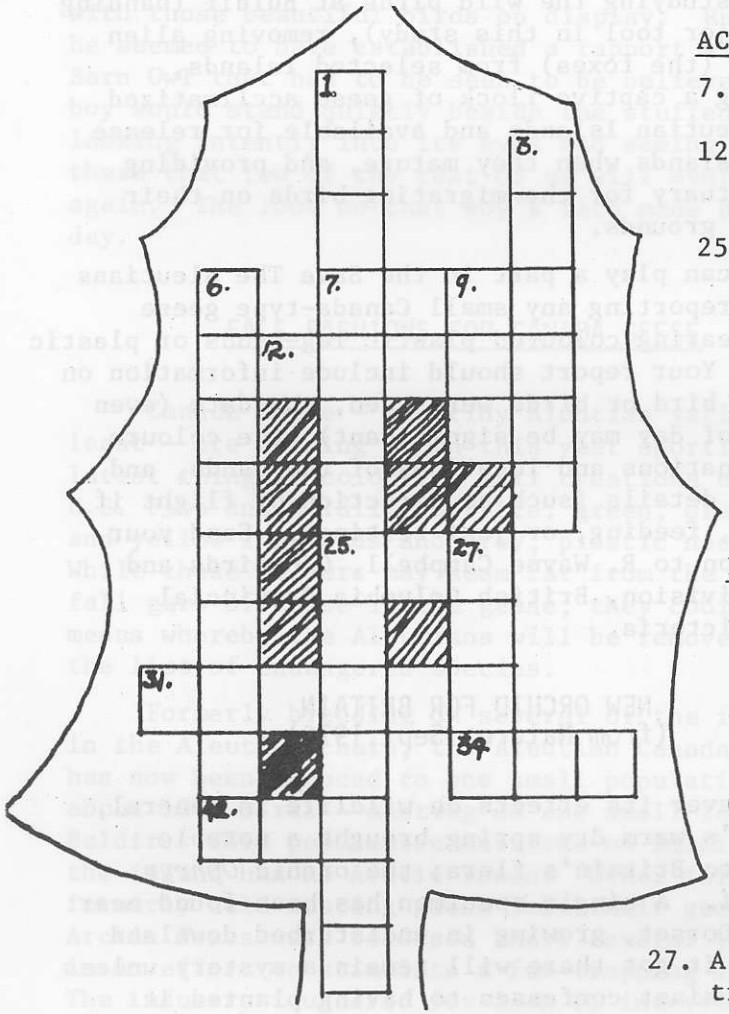
You can play a part in the Save The Aleutians Study by reporting any small Canada-type geese you see wearing coloured plastic leg-bands or plastic collars. Your report should include information on where the bird or birds were seen, the date (even the time of day may be significant), the colours and combinations and locations of the bands, and any other details (such as direction of flight if in flight, feeding, or just resting). Send your information to R. Wayne Campbell, C/O Birds and Mammals Division, British Columbia Provincial Museum, Victoria.

NEW ORCHID FOR BRITAIN
(from Nature, Sept.1976)

Whatever its effects on wildlife in general, this year's warm dry spring brought a notable addition to Britain's flora; the orchid *Ophrys bertolonii*. A single specimen has been found near Swanage, Dorset, growing in undisturbed downland turf; how it got there will remain a mystery unless some enthusiast confesses to having planted it there some years ago. One of the loveliest and most unmistakable of European orchids, *O. bertolonii* is essentially a plant of the western Mediterranean, although it occurs north to the Appenines and is also recorded from Bulgaria.

KIDS COUNTRY

Another puzzel from the past, this one a Christmas Tree Puzzel by Brenda Sigrist.



ACROSS

7. A group of three
12. a Merry sound of Christmas
25. A boy's name.
31. a type of decoration
39. Adam's wife
42. A jewel

DOWN

1. Something we all dream of
3. The now popular snowman
6. A form of static electricity
9. Illinois (abbr.)
27. A chemically treated log

ANSWERS: 7. Trio 12. Bells 25. Ray 31. Tinsel
39. Eve 42. Gem 1. White Christmas
3. Frosty 6. Lightning 9. Ill. 27. Yule

ADULT PROGRAMME

SAT. NOV. 6	Botany - The Heritage Trees of Saanich, a car tour with Michael Gye. Meet Mayfair Lanes, 9:00 a.m.
TUES. NOV. 9	General Meeting: 8:00 P.M. - Newcombe Auditorium Speaker: R. Wayne Campbell
SAT. NOV. 13	Ornithology - Island View Beach Leader: Doug Sparling (598-4262) Meet Mayfair Lanes 9:00 a.m. or Island View Beach, 9:30 a.m.
SUN. NOV. 28	Ornithology - Beaver Lake Leader: Tim Murphy (385-5357) Meet Mayfair Lanes 9:00 a.m. or Beaver Lake Parking Lot 9:30 a.m.

JUNIORS AND INTERMEDIATES

SAT. NOV. 13	Salmon spawning at Goldstream River Meet Mayfair Lanes 1:30 p.m. Drivers: Belton and Johnson
SAT. NOV. 27	Mill Hill Meet Mayfair Lanes 1:30 p.m. Drivers: Curran and Bolderston

AUDUBON

FRI. & SAT., NOV. 19 & 20 - EAST SIDE STORY: Bahamas to Quebec

With this sequel to his West Side Story, Walter Berlet visits Kirtland's Warbler, the Key Deer, the everglades, Bonaventure Island and the north shore of the St. Lawrence River.