

BOREAL BITS

PHIL BURKE



*'When the ills of life
Had chafed my spirit - when the unsteady pulse
Beat with strange flutterings- I would wander forth
And seek the woods.'*

A Winter Piece, William Cullen Bryant, 1821

WINTER SURVIVAL Part 2

A red fox works its way slowly across a snow-covered meadow. It pauses occasionally, cocks its head in the classic listening pose as it stares at the snow. Finally it stops again, crouches low and then leaps high into the air landing with its front feet first. It buries its muzzle in the snow and emerges with a vole, a meadow mouse, that struggles briefly then is gone. The fox licks its chops and continues the hunt. As a survivor, the red fox has few rivals but it is only due to the winter survival tactics of the voles and other small mammals that the fox is so successful.



(P Burke)

When August arrives, the western hemisphere north of the equator begins to lose heat to that great heat sink called space. The last hurrah of summer may blaze with a fury but it is short-lived; the retreating sun is taking its toll. The temperature of the land drops slowly but steadily causing heavy dews and clouds of mist in the autumn lowlands. And still the heat is leached from the land, the air cools and frosts appear, followed soon after by snow. In late October and November the snows come regularly and eventually some stay. Once they do, the bleeding of heat from the land slows and when the insulation from sufficient snows grows thick enough (usually around 20 cm.), the drain of heat from the rock and soil slows to the point where a constant temperature of between 0C and -10C is maintained between the surface of the ground and the snowpack. We have reached what W.O. Pruitt Jr., a winter ecologist from the University of Manitoba, dubbed the hiemal threshold. Snow is a marvelous insulator but perhaps it would be more accurate to say that trapped air is a marvelous insulator. Whether that air is trapped in fibreglass insulation, foam insulation, a wool sweater, among the crystals of snowflakes, in the down of feathers, or trapped in the hollow confines of mammal hair, it dramatically slows the transfer of heat by conduction.

With the drain of heat from the earth almost stopped, the subnivean (under the snow) life prospers in the relatively warm, moist, calm conditions. A meadow and surrounding forest areas are home to the many rodents and other small mammals that inhabit the bottom of the boreal forest food chain—voles (meadow mice), mice and shrews. As soon as snow arrives, the small mammals breathe a sigh of relief. There is no need for them to

hibernate (except for the jumping mouse), and no need for large fat reserves; the energy in the form of seeds and grasses could be stored in relatively warm underground and under-snow storage areas.



(Wm Burke)

On a wintry January day when the outdoor temperature was -20°C I took a crude measurement tool and took the temperature of the soil under 18 inches of snow. The temperature read -5.7°C . Without the threat of many predators, wind chill and rain being a thing of the past, the rodents build scores of tunnels and pass their days in a hazy twilight eating, scrapping, mating and raising families. Of course nature has provided predators for every animal she produced. Enter the weasels, shrews, foxes, owls and others. Weasels and shrews are small enough to enter the subnivean tunnels and chase down their prey or clean out a nest, but despite the predators, these small rodents are among the few mammals that can emerge from the winter in better shape than they entered.

It has always puzzled me that snowshoe hares and weasels turn white in winter. Certainly for the hare it means better camouflage from enemies and for the weasel better camouflage from prey although for the most part the weasel hunts under the snow so this argument is weak at best. The arctic hare is white in winter and summer. Doesn't white reflect more heat than a dark colour? My question is addressed in a book entitled *Winter World* by Bernd Reinhart. He states that white hairs do not possess the pigment particles melanin and thus they are hollow, and contain a fair amount of air, the greatest of all

insulators. The deer that plods through the bone-chilling snows of January and February is wearing a coat that contains these hollow hairs and finer insulating hair closer to its body. If the furnace can be supplied with fuel, the deer has nothing to fear from the cold. Next week we continue our exploration of winter survival adaptations.