WINTER HABITS—Baby spiders will begin to emerge in the early spring from the silken cocoon, left, which protects the eggs against the winter's cold. Next is the cocoon of the Promethiea moth. The violet-tip butterfly, right, spends the winter as an adult clinging to the stalk. Photographs by George A. Smith of Quarryville, Pa.

within the wood of a tree. A winter sleeping bag of chewed wood held together with a little silk protects the larvae of the goat moth, while the larvae of the ghost moth lies in a silk-lined bed.

Cocoons house quiescent pupae or chrysalids, the last stage before the insects are ready to leave in their adult form. The pupae of many beetles lie in gum-varnished or silk-decorated chambers bored in a tree. The larvae of some moths make an earthen cell in the ground and pupate there.

Some cocoons, an uninteresting brown, are passed unnoticed amid the leaves. Others are encased within curved leaves, pulled around them with silken threads. The swaying cradles of the bagworm, made in this way, are bound to the twig for security by a silken thread. A two-layered cocoon, with an air space between to protect the pupa from sudden changes in temperature, is built by the Cecropia silk moth.

Some insects survive the winter in their adult state. The young queen of the bumblebee may lie as an adult hidden deep in a mossy bank. A piece of rotten wood knocked out of place may reveal beetles that scramble quickly out of sight.

Spiders, as well as nearly all insects, hibernate in cold weather. Trap-door spiders seal the doors of their burrows with silk or place a piece of their building material across the door. Silken cases attached to the underside of stones or pieces of loose bark house other spiders. Some spiders pass the winter as eggs, protected from the cold by a silken cocoon spun by the mother spider in the late autumn before the winter's cold overcomes her.

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PHYSIOLOGY

Conditioned Dog's Heart Beats Faster

➤ WHETHER, like the soldier in the song, he wanted to murder the bugler and spend the rest of his life in bed, is not told, but a dog in the Institute of Experimental Medicine in Leningrad was conditioned to have his heart beat faster and his blood pressure rise when he heard the sound of a trumpet call, states a report received from the Soviet Scientists Committee in Moscow.

For this and other studies demonstrating the conditioned reflex theory of Pavlov, Prof. Konstantin Bykov, a pupil of Pavlov's, has been awarded the Stalin Prize.

The dog was conditioned by having adrenalin injected into a vein at the same time that a trumpet was blown. Adrenalin, also called epinephrine, is a product of the adrenal glands which stimulates heart activity and raises blood pressure. After several simultaneous trumpet blowings and adrenalin injections, the trumpet was blown when adrenalin had not been injected. The dog's heart nevertheless began to beat faster and his blood pressure increased.

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RADIO

Radio Amateurs Report First Use of Microwaves

➤ RADIO AMATEURS have made contacts over a range of 31 miles in the first use of super-high frequency microwave bands outside of military and commercial tests.

A. E. Harrison, W6BMS, and Reuben Merchant, W2LGF, both of the Sperry Corporation, New York, tested the new bands shortly after the Federal Communications Commission released them to amateur radio operators. They first made contact at five miles and later reached 31 miles.

Microwaves, used in wartime radar, are found in super-high frequencies that have not been open to amateur radio operators before. Limited in distance, microwave beams are narrower than ordinary waves and permit use of smaller antennae and directional equipment not practical at lower frequencies.

Messrs. Harrison and Merchant used the 5250 to 5650 megacycle band in their first experiments with the super-high frequencies.

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