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PREFACE

The range of problems encountered in building design construction and operation, is very wide, as demonstrated by the subject of this report. In this case, entomologists of the Federal Department of Agriculture and the Nova Scotia Department of Agriculture were able to assist; their interest and cooperation are gratefully acknowledged. Three examples of unusual insects occurring in large numbers in houses are now recorded for future reference. The authors are research officers on the staff of the Atlantic Regional Station of the Division at Halifax, the senior author being officer-in-charge. Their work involves the provision of an information service on building to the Atlantic Provinces in the course of which they are able to study and report information on field problems, as a contribution to the improvement of building in Canada.

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N. B. Hutcheon,
Assistant Director.

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In July 1960 an inquiry was received from a Halifax area builder (after he had exhausted all normal channels of inquiry) on the invasion of three of his newer houses by small insects to the extent that they had become a major nuisance. These insects reportedly entered the living area through warm-air openings from the crawl spaces below. Through the cooperation of Mr. Douglas Embree of the Department of Agriculture's Forest Biology Sub-Laboratory at Debert, N.S., it was possible to identify this insect as the "Spring-Tail" and so recommend a cure.

In February 1961 a new species believed to have originated in the crawl space of one of the same houses appeared. This insect was identified by Mr. M. E. Neary, Entomologist of the Nova Scotia Department of Agriculture at Truro, N.S., as the "Fungus-Gnat"; a treatment was suggested.

In March 1961 the owner of an older home reported the presence of "Powder-Post Beetles" in floor joists and requested a remedy for their elimination. While it is quite simple to treat wood against destruction by this beetle, it is not always possible to eliminate them once they have infested concealed wood.

Information on the identification, habits, environment, and methods for disposal of these unusual insects is contained in this note for use in replying to similar future inquiries. It is of particular interest due to our study of crawl space systems.

For information on insects not described in this note it is suggested that samples be submitted in bottles to the Department of Agriculture, Entomology Division (Household Insects), K. W. Neatby Building, Carling Avenue, Ottawa, for identification and recommended disposal methods.

"SPRING-TAILS" - ORDER THYSANURA

"Spring-Tails" are very small insects rarely coming under the observation of anyone but entomologists. Sometimes they accumulate in vast numbers and become conspicuous in spite of their small size. They have no wings but are provided with a wonderful means of jumping. At the end of the body is a tail-like organ bent under when the insect is at rest. This appendage can suddenly straighten out and project the insect high

in the air and several feet away. They usually try to escape by a succession of quick leaps. They can also run very quickly.

These insects require a certain amount of moisture and seem unable to exist for any length of time in dry conditions although they survive at various altitudes and under widely differing climatic conditions. They commonly are present on the snow in spring and sometimes cover the surface of small pools of still water. They have been found in old wells, soil humus, and even in stiff clay subsoil at depths of 6 ft (probably via small root paths), and in dead leaves in the woods. Individual insects of this species are often found beneath window sills, in bathrooms and "sometimes", under favourable conditions, in considerable numbers. They are also apt to settle where house plants are kept and where conditions are moist enough to be agreeable for them. It is believed that "Spring-Tails" live mostly on decaying vegetable matter or mould.

To control the insect it should be remembered that "Spring-Tails" require certain degrees of moisture and cannot survive in dry conditions such as usually exist in most parts of a house. When these insects become troublesome, the moist objects or surfaces on which they gather should be removed. If this is impossible, they could be dried by an application of slaked lime and sulphur, or by heat.

Houses ready for occupancy can be dried out by using the heating system, as insects of this type feed on minute fungi and are known to infest newly constructed houses when damp conditions exist. A residual insecticide can also be applied. Suitable insecticides consist of 2 per cent Chlordane in an oil base or 5 per cent D. D. T. in an oil base.

"FUNGUS-GNAT" - FAMILY MYCETOPHILIDAE

"Fungus-Gnats" are very small, more or less mosquito-like in form; it is difficult to identify them as more than 100 species exist. They are active, can leap as well as fly. The larvae are gregarious. Some species often attract attention because of the strange habit of sticking together in dense patches. When the larvae are about to change to pupae, as assemblage will march over the surface in snake-like lines 4 or 5 in. wide, 10 or 12 ft long, piled up 4 to 6 deep. They crawl over each other so that the column advances about 1 in. a minute. In Europe these assemblages are called army-worms, and in America worm-snakes. The larvae resemble tiny white maggots.

The name "Fungus-Gnat" is derived from the fact that many of this species breed in fungi. They are often found there in great numbers

and in damp places near decaying vegetable matter. They can live on and destroy mushrooms and are frequently pests in mushroom cellars. Some species are found in decaying wood and in crawl spaces under houses. The larvae are sometimes abundant in soil where there is decaying vegetable or organic matter. Moist rotting wood mixed with the soil and certain types of fungi are particularly inviting to them. They have been found in mouldy leaves and under bark.

In general the larvae will not attack anything of importance around the house. If the presence of the adults (tiny flies) is objectionable, they can be reduced by soaking the soil in which they are developing with nicotine sulphate using 1 teaspoonful to 1 gallon of water or with a strong soap solution consisting of about 1/4 lb of soap dissolved in 1 gallon of water. It is further suggested that 5 per cent D. D. T. household spray on the exposed woodwork in crawl spaces would be helpful in keeping the numbers of tiny flies greatly reduced.

"POWDER-POST BEETLES"

While these beetles can be divided into five groups, the lyctus, cerambycids (old house borer) and the cossonids are liable to be the most troublesome in completed houses. Lyctus beetles are red to black, about 1/4 in. long and slightly flattened. The cerambycids are blue, black, or pale yellow to reddish brown and are 1/2 to 1 in. long. The old house borer belongs to this group; it is black with greyish markings on wing covers and is about 3/4 in. long. Cossonid weevils are reddish brown or black, 1/8 to 1/5 in. long and oval to cylindrical.

Lyctus beetles infest hardwoods, conssonid weevils, softwoods. Some cerambycids infest hardwoods and some softwoods. Lyctus beetles lay eggs in exposed pores in the sapwood of most hardwood species. The larvae are found in hardwood flooring, furniture, picture frames and trim.

The old house borer as cossonid weevils infest seasoned softwoods, often repeatedly. The borer infests framing and subflooring in old and new construction and also stored lumber. It is rapidly spreading over the eastern half of the continent and is becoming a serious pest in wood buildings. Cossonid weevils are found in pine flooring, baseboards, wall stops, and roof trusses.

"Powder-Post" beetles damage wood by tunneling and cutting surface holes, sometimes creating a honey-comb appearance. Most tunneling is done in sapwood and damage is rare in large timbers. Beetles can be detected by tunneled wood, surface holes, borings near the holes

or on the floor below; the adults can often be seen crawling on the wood. In quiet surroundings one may hear a rapping or ticking sound made by tunneling larvae.

Severe infestation as when beetles are concealed by interior surface material call for an experienced exterminator to bring the problem under control -- probably by fumigation. If infestation is light and unconcealed, the owner may control them by spraying or brush coating the wood with an insecticide. Repair work should be coordinated with control work.

Beetles that make small surface holes can be controlled by saturating the wood with a deodorized kerosene such as deobase or ultrasene, which contains 5 per cent D. D. T., or 2 per cent Chlordane, or 0. 5 per cent lindane. One gallon applied with a garden sprayer or paint brush in repeated light coats so as to saturate the wood will treat about 100 sq ft of surface. Drying takes several hours. About 1 1/2 pints of insecticide per cubic foot of wood are needed for treatment of borers especially where thicker wood such as joists, studs, and rafters are infested. This is equivalent to treating the exposed surface of 7 linear ft of 2 x 10 in. joists, 12 ft of 2 x 6 in. rafters, 18 ft of 2 x 4 in. studding or 12 sq ft of subflooring. It may take 3 weeks to 3 months before all larvae are reached and killed.

Fumigation requires gases such as Hydrocyanic Acid or Methyl Bromide and should only be done by licensed fumigators. Fumigation methods of the "home remedy" type, such as burning sulphur candles, are ineffective.

CAUTION: Most insecticides mentioned are poisonous and should be kept beyond the reach of children and pets. Doors and windows should be open when using them and prevent their contact with the body. Do not smoke or have pilot lights on while spraying. All types should be kept away from foods.

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