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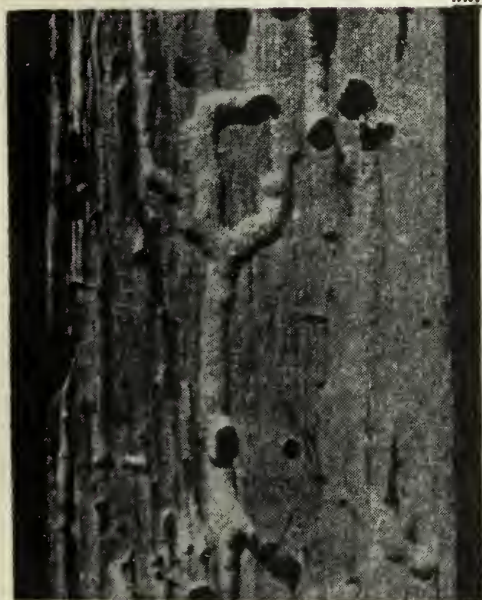
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POWDER - POST **BEEETLES**

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in Coastal British Columbia

By D. N. Smith



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POWDER-POST BEETLES IN STRUCTURAL TIMBER IN COASTAL BRITISH COLUMBIA

By
D. N. Smith

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These insects are the most widespread and serious cause of property depreciation known on the coast. In Victoria, where some of the oldest houses are to be found, infestations are frequently reported. Occasionally, other wood-destroying insects may also be present but, in most cases, they are of secondary importance.

This publication has been prepared to assist property owners in detecting, appraising, and controlling infestations of these insects.

The words "powder-post" describe the final condition of wood long infested by the beetles. Their grubs feed inside the wood, reducing it to an outer shell with the inside riddled by tunnels which are packed full of fine wood dust and excrement. This type of damage is caused by beetles of four closely allied families; in northwest Pacific regions, native species of the family Anobiidae are the most important*. In addition, the destructive furniture and "Death-watch" beetles of Europe, belonging to this family, have been accidentally introduced. There is considerable uniformity of behaviour and habits in most of the species known to be present, so that the problem is treated here in terms that will apply generally.

IDENTIFICATION OF DAMAGE:

Little mounds or sprinklings of light-colored powdery dust are the first symptoms of attack. These will be found on horizontal, flat surfaces such as benches and shelving in basements, or on stored materials in commercial premises. In the woodwork overhead, close inspection will reveal small, round holes. (Fig.1) Tapping the wood will produce a fine cloud of powder. This powder may also be noted caught in spider webbing. (Fig. 2). The *holes mark the exit* of full-grown beetles and most of the powder is pushed out from the holes by grubs still in the wood. *The grub entering the wood from the egg does not leave any visible sign of entry.*

Attack by these insects is commonest in the under structure of buildings, joists being especially susceptible. Beams, sills, posts, exposed sheathing, and subflooring become attacked as the infestation progresses. A full basement does not prevent attack. Factors favoring attack are the use of wood containing much sapwood, or open grain, under conditions of shade and poor ventilation. A very risky practice is the storage of infested lumber salvaged from derelict structures. Another is the accumulation of increasing amounts of discarded woodenware of all kinds in dead storage. There is a tendency in the older settlements for increasing numbers of buildings to become infested. Continuous reinfestation, rather than a single large mass invasion, causes advanced deterioration. The

**Hadrobregmus destructor* Fisher, *H. gibbicollis* (Lec.), *Coelostethus americanus* Fall, and *C. quadrulus* Lec. are recorded.

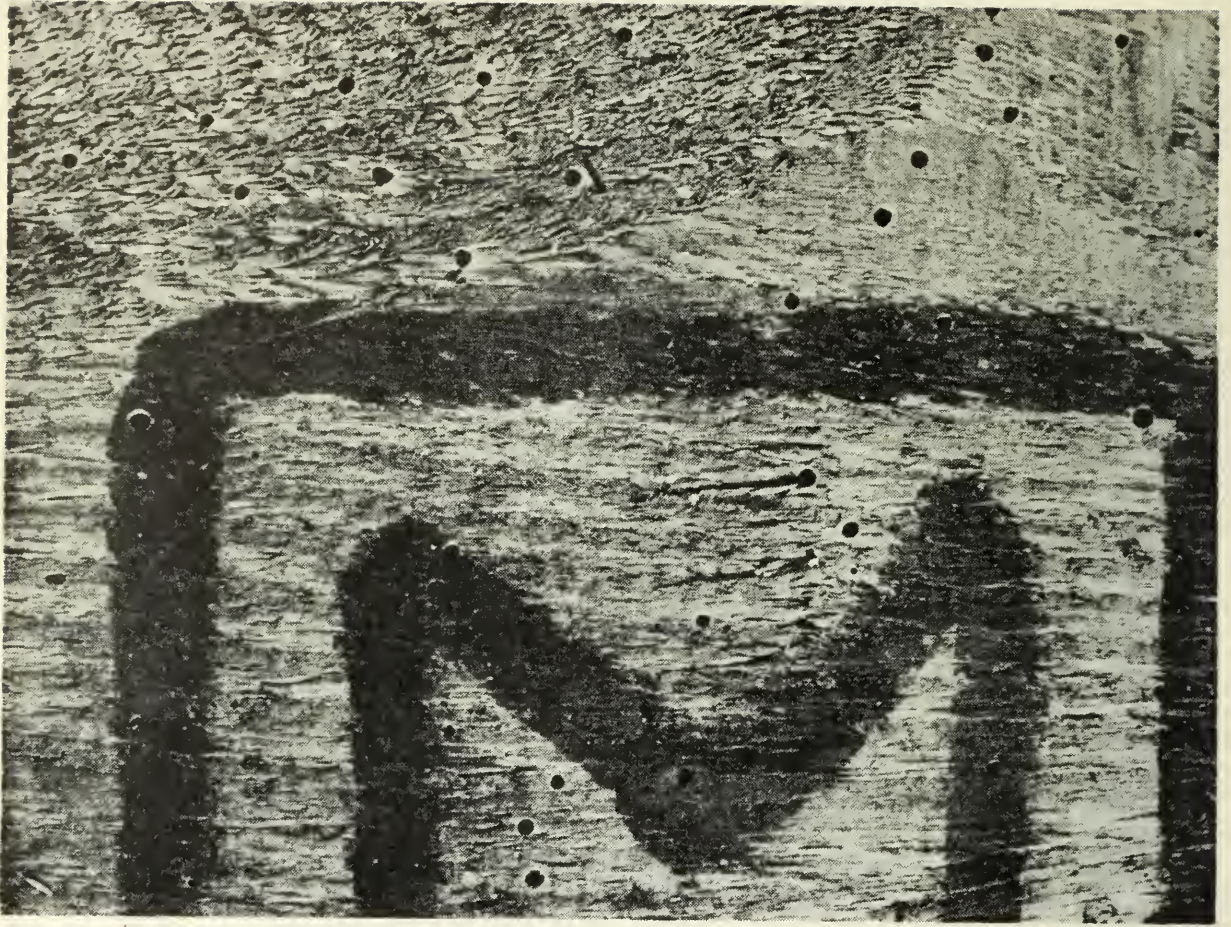


Figure 1. - Section of packing case from heavily infested basement.

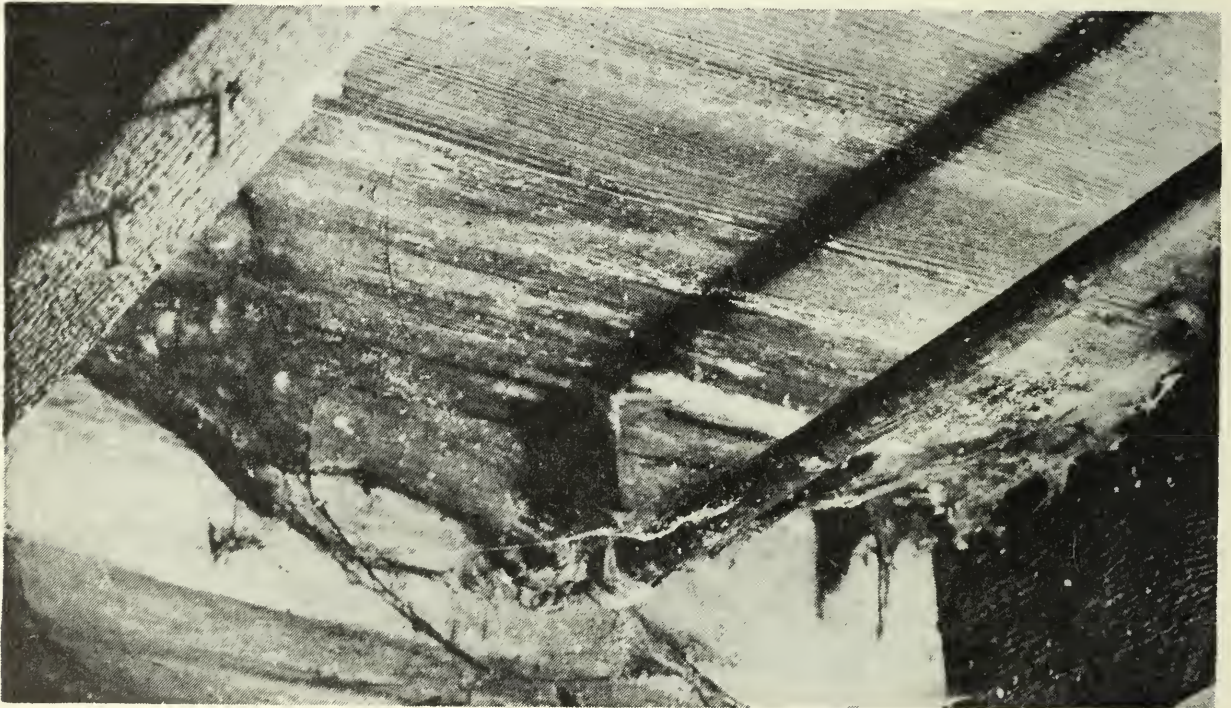


Figure 2. - Subfloor infestation, showing boring dust caught in spider webbing.

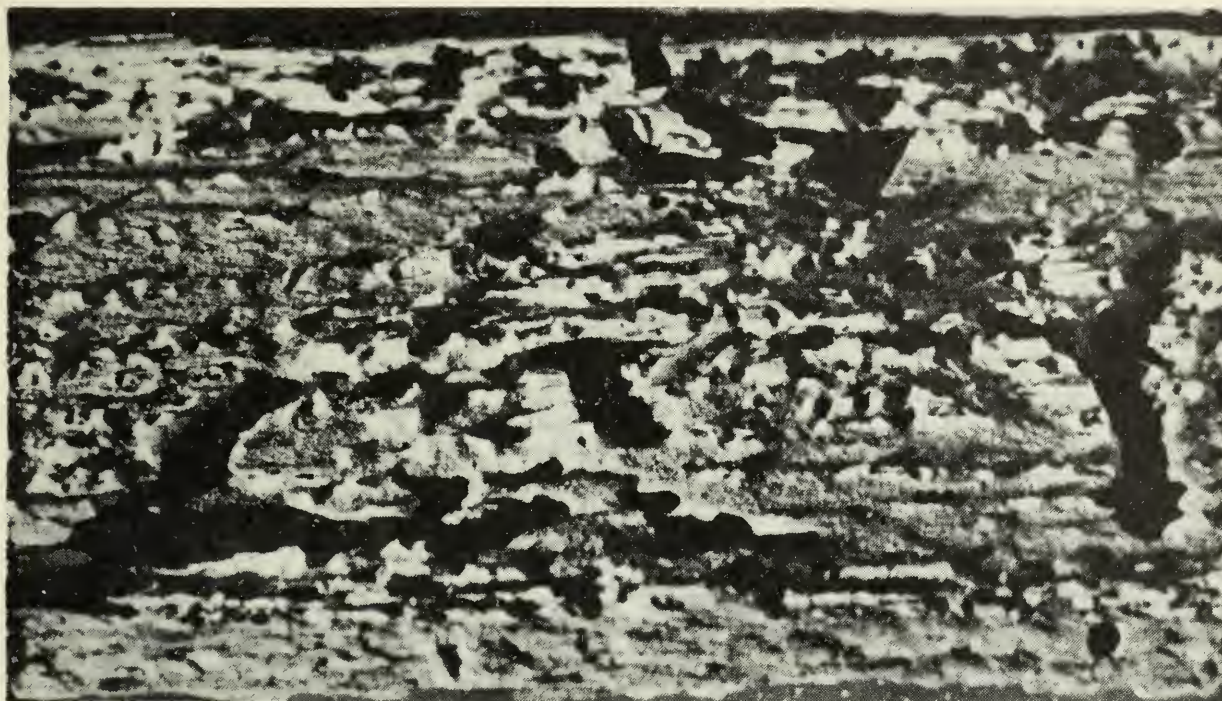


Figure 3. - Thin section of wood at oblique angle to show tunnelling between annual rings of wood.



Figure 4. - Collapsed post and broken sheathing, 60-year old house, Victoria, B.C.

surface of the wood may be normal in appearance except for numerous exit holes. Inside, however, it is really a maze of powder-packed tunnels and splinters of sound fibre. (Fig. 3). Eventually the strength is so far depleted that structural members become seriously weakened. This may be indicated by sagging, shaking, or collapse. (Fig. 4).

The symptoms noted above will clearly distinguish the attack of these insects from that of termites, carpenter ants, and large wood-borers.

DEVELOPMENT OF THE BEETLES:

Eggs are laid about midsummer where natural wood is exposed, as in cracks, joints, rough sawing, or immediately inside the holes from which beetles have previously emerged. After hatching, the grub enters the main body of the wood and produces a wandering tunnel as it feeds, packing the tunnel behind it with the powdery dust characteristic of attack by these insects.

When full grown, which may be several years after entry, the grub will be found in an enlarged section of its gallery, just beneath the surface of the wood. In this it changes to the pupal or resting state from which it soon transforms into an adult. The adults appear in late spring and early summer, making the round holes as they escape from the wood. The parent beetles of the various local species are much alike to the naked eye. They are small, cylindrical, greyish to brownish beetles about one-fifth inch in length.

Beetles that emerge inside buildings usually become trapped there. They may be seen at windows at this time, but after a period of attempted escape they frequently re-infest the premises.

PREVENTION AND PROTECTION:

Uninfested as well as infested premises should receive careful attention. Simple sanitation and inspection procedures will reduce the hazard from attack in sound structures.

Sanitation

Under no circumstances store used lumber, fencing, boxes, or furniture if there are emergence holes in the wood or if it breaks easily with release of wood powder. This material should be burned as quickly as possible.

Avoid accumulating old boxes, unwanted furniture, and scrap wood, in basements, outbuildings, and yards.

When making additions or alterations with used lumber, inspect it very carefully; for reasons not known at present wood becomes more susceptible to these beetles as it ages.

Carelessness in the above details often leads to early infestation in comparatively new buildings.

Inspection

Provide yourself with a good flashlight, a hammer, and an ice-pick, and carefully examine the wooden undersides of buildings in midsummer. Make this a regular annual practice. Look for powdered wood accumulations in spider webbing, or on top of beams, sills, shelves, fixtures, and other flat surfaces. Look for

small round holes in joists and other members, including the subfloor. Tap these with the hammer; a powdery cloud indicates attack. The variation in tone from sound to unsound wood will help you trace out the extent of infestation. Check this with the ice-pick.

If an infestation is found, the understructure should be examined for sagging or shaking. Stress signs such as splintering or shearing around spikes should be noted, especially where they tie joists to sills and plates, and where posts meet joists and beams. If you find evidence of serious infestation, seek advice from someone qualified to pass judgement on structural safety such as the municipal building inspector or an architect.

When checking premises for signs of beetle attack do not overlook the exterior. Pay particular attention to the undersides of porches and eaves, around ventilators, and other openings. Examine the footings of porch posts and fences, as well as all wood near the soil line. Garages, outbuildings, and their contents should also be inspected. Remove and destroy all loose wood material found infested unless their value warrants treatment.

Chemical Treatment

The earlier the infestation is detected, the simpler will be the procedures required for control. Unless very severe infestation is present, the owner should experience little difficulty in applying the necessary control measures himself. Very early attack of a light nature in accessible structures such as the lower edges of joists may be planed or chiselled off down to sound wood. This can then be painted with preservative.

Before any treatment is applied, the wood surfaces affected should be cleared of dust and webbing. A vacuum cleaner with brush attachment will be found useful for this purpose.

The best time for chemical treatment is late spring. A number of insecticides are available, which may be applied by brushing or spraying. Brushing is not suitable for large areas, and it is also difficult to obtain complete coverage of the tops of beams and inner faces of joists resting on beams and sills. Unless carefully done it is apt to leave numerous small areas untreated, especially in cracks between subflooring and sheathing. On limited and accessible areas, brush treatment is ordinarily useful and economical.

Large areas will require power spraying, for which purpose paint-spray equipment can be rented in many cities. In addition to this equipment, coveralls, plastic-coated long-sleeved gloves and a full-face respirator are essential for comfort and protection.

Two chemicals are now widely used for powder-post beetle control. Pentachlorophenol, in 5 per cent solution, is obtainable ready for use; it is also available in concentrated form which may be diluted with fuel oil to bring it down to the required 5 per cent. The other material contains formulations of metallic naphthenates, such as copper or zinc. Copper naphthenate leaves a marked greenish stain which generally disappears on exposure to sunshine and air; the zinc naphthenate does not materially alter the natural color of wood, but it is not so effective as the copper compound. Pentachlorophenol is economical, practically colorless, and non-leaching. Both materials are also effective in preventing decay.

Apply the spray so that all wood surfaces are wet to dripping, being careful to cover the tops of beams, the subfloor above beams, and all points of union



of one timber with another. Do not forget door-frames, window-frames, and stairs. Keep doors and windows open while spraying; as both copper naphthenate and pentachlorophenol are carried in light petroleum solvents. Do not light matches or smoke in the area for some time after the sprayed wood has dried.

In very serious infestations where structural weakness has developed, removal and replacement of affected material may be unavoidable. In extensive but less serious infestation, it would be wise to apply treatment two years in succession, and again five years later.

Note: If valuable shrubs are growing close to doors and windows they should be covered to the ground line with canvas or plastic to protect them from spray drift.

Hardwood Floors and Trim

Lightly infested lumber sometimes arrives on the coast. Later, in service, numbers of small holes or small beetles are noted on the wood surface. These beetles are true powder-post beetles, family Lyctidae.

Special, fast-drying preparations, containing pentachlorophenol are available which should be generously swabbed or brushed on to the wood and into the holes, cracks, and crevices. Leave there about half an hour and wipe off residue. These compounds will not mar the finish. After treatment fill the holes with plastic wood colored to match. Any fresh holes will then be readily detected and similar treatment can be repeated until no more are noted.

Note: For additional information on special cases apply to the Forest Biology Division, Science Service, Department of Agriculture, Ottawa, Ontario, or to the Forest Biology Laboratory, Zoology Section, 409 Federal Building, Victoria, B. C. When possible submit a sample of the infested wood, preferably with a sample of the associated insects. Additional copies of this Publication are available on request.