

# TIMBER AND FURNITURE

## BORING INSECTS

Wooden buildings, wooden furniture and woodwork of all descriptions are subject to damage by insect pests. The principal timber borers which cause damage in New Zealand are:—

1. Termites (*Calotermes browni*, *Coprotermes* spp., etc.).
2. Two-toothed Longhorn (*Ambeodon-  
tus tristris*).
3. Powder-post Beetles (*Lyctus brun-  
neus*, *L. linearis*).
4. The Common House-borer or furni-  
ture Beetle (*Anobium puncta-  
tum*).

The last mentioned is by far the most destructive throughout the country as a whole, although in restricted areas in the North Island termites may cause more concern to householders.

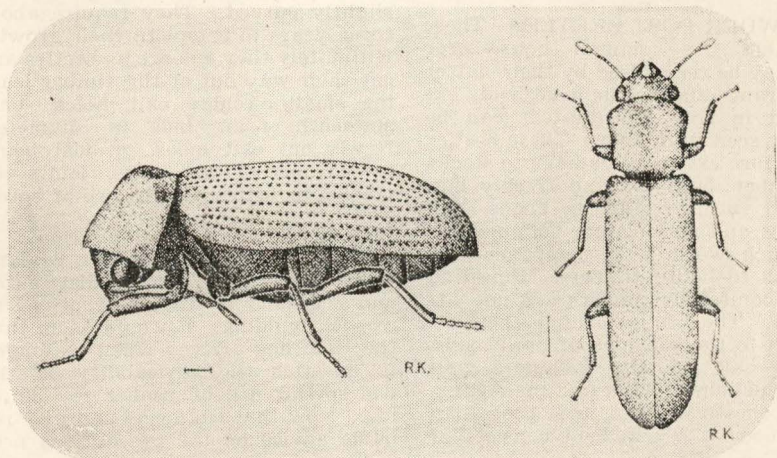
**TERMITES** or "White Ants" are social insects which live together in densely populated communities and are most abundant in tropical and warm temperature climates. Of the two native termites found in New

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Zealand, one is a damp-wood form and of no real significance as it confines its attention largely to decaying logs and tree stumps in the bush. The other is a dry-wood form and is responsible for extensive damage mainly to buildings and power poles. The termites which have threatened to establish themselves and destroy buildings in the Auckland, New Plymouth and Gisborne areas are Australian subterranean termites. They



travel from their underground nests to wooden structures above ground, inside earthen tubes which they construct for this purpose. Those and other Australian species, together with the native dry-wood termite also attack poles, bridge timbers, sleepers, posts and trees. When termites invade timber they live in perpetual darkness and never come to the surface. Inside the wood they excavate definite tunnels separated by thin partitions until ultimately nothing may be left but an empty shell. Houses built of timber, both exotic and native, may be extensively damaged within a period of six years.

In the warm northern parts of New Zealand, attempts should be made to safeguard wooden buildings from termite invasion both by the use of termite proof foundations and by termite shields properly installed on these foundations. Special methods such as the blowing of arsenical dusts into runways are required to deal with infestations and such work is best left to trained technicians. Immediately termite presence in a building is suspected the local authorities should be notified.

**TWO-TOOTHED LONGHORN.** This large, native, long-feelered beetle normally breeds in dead trees in the bush but has extended its attack to milled timbers such as rimu, matai, kahikatea, *Pinus radiata* and *macrocarpa*. The beetle is narrow bodied and reddish brown; the grub elongate, narrow and white. Both adult and grub may measure up to 1 inch in length. The grubs require several years to complete their growth and during that long period they excavate large oval tunnels, about  $\frac{1}{4}$  inch along the widest diameter, so that the strength of studs, rafters, joists or floor boards may be weakened.

**POWDER-POST BEETLES.** These resemble the common house-borer but may be recognised by their flatter appearance and by the head being extended in front so that it can be clearly seen from above. These beetles may cause extensive damage to stocks of timber both old and freshly cut, and to furniture, sports goods, tool handles and many other commodities of which wood is a component, as well as to house timbers. Pine and other coniferous timbers are not attacked. The beetles confine their attention to the sapwood of hardwoods, mainly oak, ash, elm, sycamore, walnut, hickory, African mahogany, sweet chestnut, tawa and Australian hardwoods. Their food consists of

starch, found only in the sap-wood, so that the sapwood of hardwoods may be reduced to a fine powder as the grubs eat their way through it.

The beetles lay their eggs, not in cracks or crevices, but in the wood pores. The grubs burrow with the grain, and produce fine, floury dust which is tightly packed in the tunnels. The whole life cycle is completed in one year, or less in heated buildings, and the adults emerge through small, round exit holes.

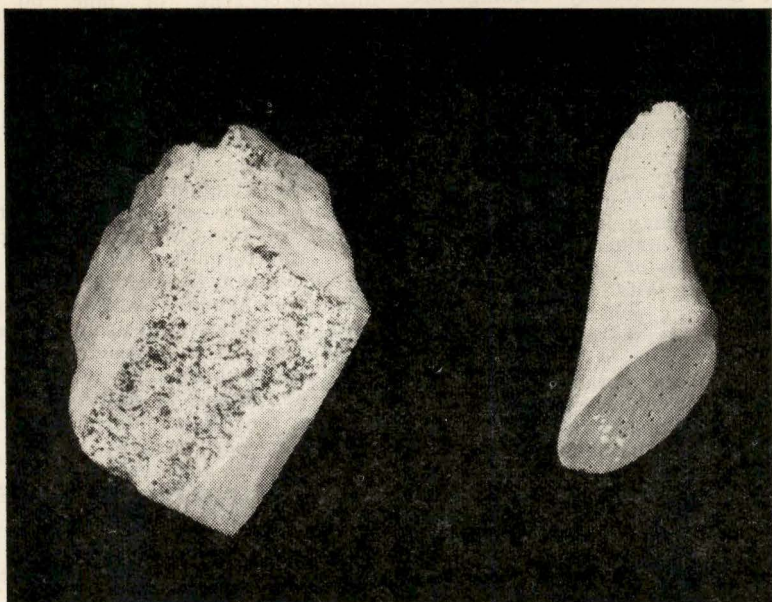
#### COMMON HOUSE-BORER OR FURNITURE BEETLE.

This is the common borer of well seasoned timber and is responsible for what appears to be enormous damage to wooden buildings and furniture throughout New Zealand. Its preference is for the sapwood of old, well-seasoned softwoods but it will also attack the heartwood of both softwoods and hardwoods. With the exception of Australian eucalyptus practically all timbers both New Zealand grown and exotic are liable to attack.

The beetle is about one-eighth inch long, hard and convex, reddish brown in colour and readily recognised by the shield which overlaps the head in front, and seen sideways, looks like a little bonnet or hood covering it. The adult beetles emerge from the timber any time between November and March and may be seen walking or flying about indoors. The females may return to old flight holes to lay their eggs or they may lay them in some suitable slit or crack but usually avoid smooth or exposed surfaces. The grubs, as soon as they hatch, commence tunnelling in all directions and ultimately reduce the wood to a honeycomb structure which contains coarse, gritty wood dust. The grubs are soft and white, fairly plump and slightly curved. They require about three years to complete their growth. Ultimately they emerge as beetles and eat their way out of the timber leaving small circular exit holes one-sixteenth of an inch in diameter. Newly cut exit holes, or dust being forced out of old holes, joints or cracks, indicate the presence of borer.

#### PREVENTION AND CONTROL.

In a country such as New Zealand where borer is so widely distributed and considered so destructive to wooden buildings, it would seem that the time has arrived when we ought to question the advisability of the widespread use of timber for building. Now that engineers can give reliable advice on the precautions nec-



**On left: Matai (black pine) timber removed from a church. The furniture beetle, or common house borer has completely honey-combed the sapwood but has scarcely touched the heartwood. Right: Axe-handle of hickory completely destroyed by powder-post beetles.**

essary to render buildings earthquake proof, greater use of brick, reinforced concrete and other such materials which are not subject to insect attack could well be considered. The impregnation of timber with preservative materials, even if it did ensure a reasonable degree of immunity to attack, is both difficult to effect and exceedingly costly, and that extra cost may be hard to justify if the timber is of low grade or poor quality. The damage done by the house-borer may be more apparent than real. Houses built of good timber and well constructed are rarely weakened to an extent to render them unsafe. Even if the timber and the construction are both inferior the house is likely to be out of date and its reasonable life completed before house-borer renders it uninhabitable.

In the control of borer in existing buildings the first essential is to find out the extent and the severity of the attack. Any timbers which are very severely bored had better be removed as they may be structurally unsound. If the trouble has been long-standing the grubs will be right through the deeper parts of the timber where substances will scarcely penetrate however carefully treated, and these

timbers if allowed to remain will continue to keep up the supply of borer. If the wood which is to replace damaged timbers is not to be painted then it should be creosoted. This should be done on a hot, sunny day and the timber must be well seasoned and thoroughly dry on the outside before the creosote is applied. All fitting and trimming should be done before creosoting. Once replacements have been made all woodwork, if unpainted, should be thoroughly treated by brushing or spraying with a good quality creosote. Timber which is to be painted must not be creosoted and creosote cannot be used on painted surfaces, or where staining or bleeding or strong odour would be objectionable. The more creosote which the timber absorbs the better, so in the case of short lengths the hot and cold bath method is preferable to brushing or spraying. This can be carried out with two large oil drums, immersing the timber first in hot creosote (180 deg. to 200 deg. F.) to drive out the air and then transferring it to a cold bath of creosote (90 to 100 deg. F.) or allowing the hot bath to cool. The timber should be left one to two hours in the hot and twice as long in the cold bath.

The more frequently buildings are treated with creosote the deeper will be the penetration.

The treatment of timber with kerosene or with a mixture of kerosene and turpentine in equal parts belongs to the same category as treatment with creosote but they are far less satisfactory methods as they give poor protection for the future although they may kill borer present at the time of application.

Another class of wood preservatives is inorganic salts used in water solutions. The principal salts used are zinc chloride, sodium fluoride, sodium chromate, sodium arsenate, copper sulphate, potassium dichromate, mercuric chloride. These toxic chemicals are not suitable for use on the farm or by the householder. They are used for the pre-treatment of timber before construction takes place and such names as Celcure, Tanalith, Wolman salts are associated with this class of treatment.

The third group of wood preservatives are toxic chemicals dissolved in some colourless and usually volatile solvent and carried in oil. The principal ones are Pentachlorophenol, Chlorinated Naphthas, Zinc naphthenate, and Paradichlorobenzene. The various firms which treat existing buildings and furniture in this country use one or other of this group. They have the advantage over water soluble substances in that they can be used on seasoned and dry timber without causing swelling.

For the treatment of furniture and internal woodwork to kill borer already present one may use Paradichloro-benzene in kerosene and turpentine. To prepare the mixture take 2oz. Para-dichloro-benzene crystals and dissolve them in  $\frac{1}{2}$  pint of kerosene by periodic stirring over some hours. Add turpentine at the rate of from one to four pints. Liberally drench the affected timbers with this solution but bear in mind that it has little effect in future protection. Paratachlorphenol is more effective than Para-dichloro-benzene but it is irritating to the skin and is not a substance that can be handled freely by the inexperienced. A 5 per cent solution can be prepared by dissolving the crystals in ortho-

dichloro-benzene or pine oil, or benzole, or other solvent and then bulking up with lighting or power kerosene or light diesel oil in the proportions:

Pentachlorphenol	5	parts	by	weight
Solvent	.....	2	"	"
Oil or kerosene	.....	93	"	"

The use of a quantity of linseed oil whether as the solvent or in addition to one of the other solvents, prevents the formation of crystals on the surface of treated timbers.

To avoid handling solid Pentachlorophenol, which is unpleasant, there is on the market a proprietary article "Pentacon" which contains sufficient Pentachlorophenol in solution to give a 5 per cent Pentachlorophenol solution when one part by volume of "Pentacon" is added to 10 parts by volume of kerosene, oil, turpentine or other carrier.

To sum up it may be said:

- (a) Use non-susceptible building materials wherever possible.
- (b) Where timber must be employed use high grade heart timber and ensure that the ventilation is adequate and the construction sound.
- (c) For farm buildings and other wooden structures treat liberally and periodically with creosote.
- (d) Avoid introducing the borer into the house. Do not bring in infested furniture unless it has been treated.
- (e) See that all borer infested timber around the premises which is being reserved for firewood is burned before November when the Furniture beetle commences to fly.
- (f) Be suspicious of any piece of furniture which has plywood or low grade timber forming the back or the bottoms of drawers.
- (g) Remember that the treatment of timber to destroy borer is most difficult to effect satisfactorily, is an expensive item and that there is no certainty that timber can be treated to give any appreciable degree of protection in the future.

Copies of this Bulletin may be obtained from the Secretary, Canterbury Chamber of Commerce, P.O. Box 187, Christchurch.