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DEFECTS IN BIRCH ASSOCIATED WITH INJURIES MADE BY *XYLOTERINUS POLITUS* SAY.

The purpose of this note is to give a brief pictorial description of the internal defects in paper birch (*Betula papyrifera* Marsh.) and yellow birch (*B. alleghaniensis* Britt.) that are associated with external signs of infestation by the ambrosia beetle *Xyloterinus politus*[1] (fig. 1). The information was gained during studies of trees growing in the White Mountains of New Hampshire.

Adult beetles usually bore through lenticels in trees weakened earlier by mechanical wounds, living agents, and other causes (fig. 2). Apparently when certain infested trees do not die, the beetles depart, leaving behind the galleries they have made, approximately 1/16 inch in diameter. These wounds initiate processes that result in discoloration (fig. 3). Bacteria and fungi often enter through the wounds, where they contribute to the discoloration processes. The fungi may even cause decay when conditions are favorable.

The extent of internal defects arising from beetle infestation depends primarily on (1) the number of beetle holes, and (2) the extent and location of the internal defects already present in the tree at the time of attack.

There are three general patterns of defect: (1) spindle-shaped islands of discoloration (vigorous trees, light infestation) (fig. 3 and 4); (2) irregular patches of discoloration resulting from coalescence of many islands of discoloration, and sometimes further coalescence of such discoloration with large central discoloration already in the tree (medium

[1] The author is indebted to Dr. Jack Krall of the New York State University College of Forestry at Syracuse for identifying the beetle.

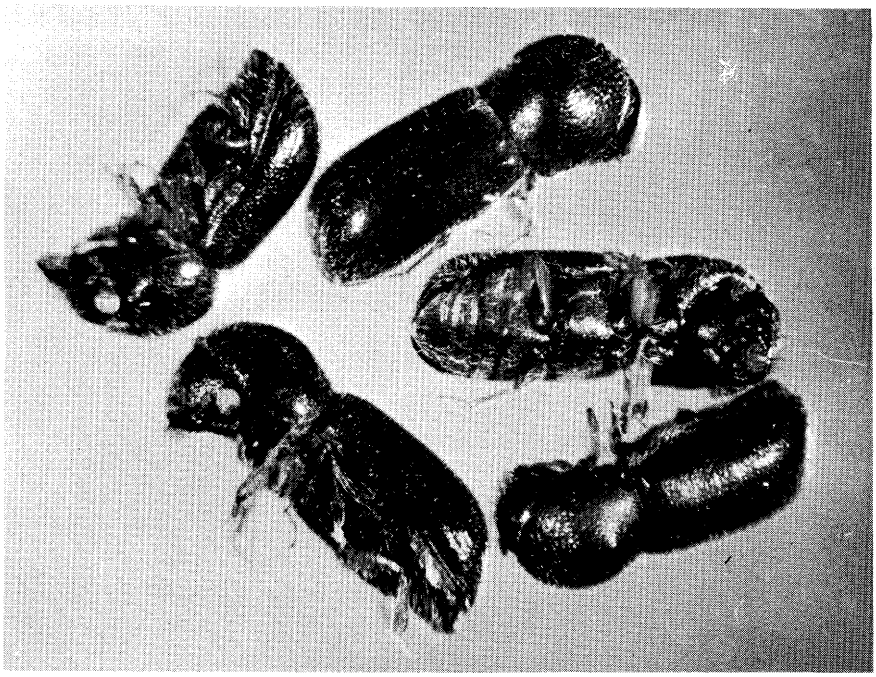


Figure 1. — Ambrosia beetles (Xyloterinus politus).

Figure 2. — Small holes in lenticels of birch tree indicate attack by X. politus.

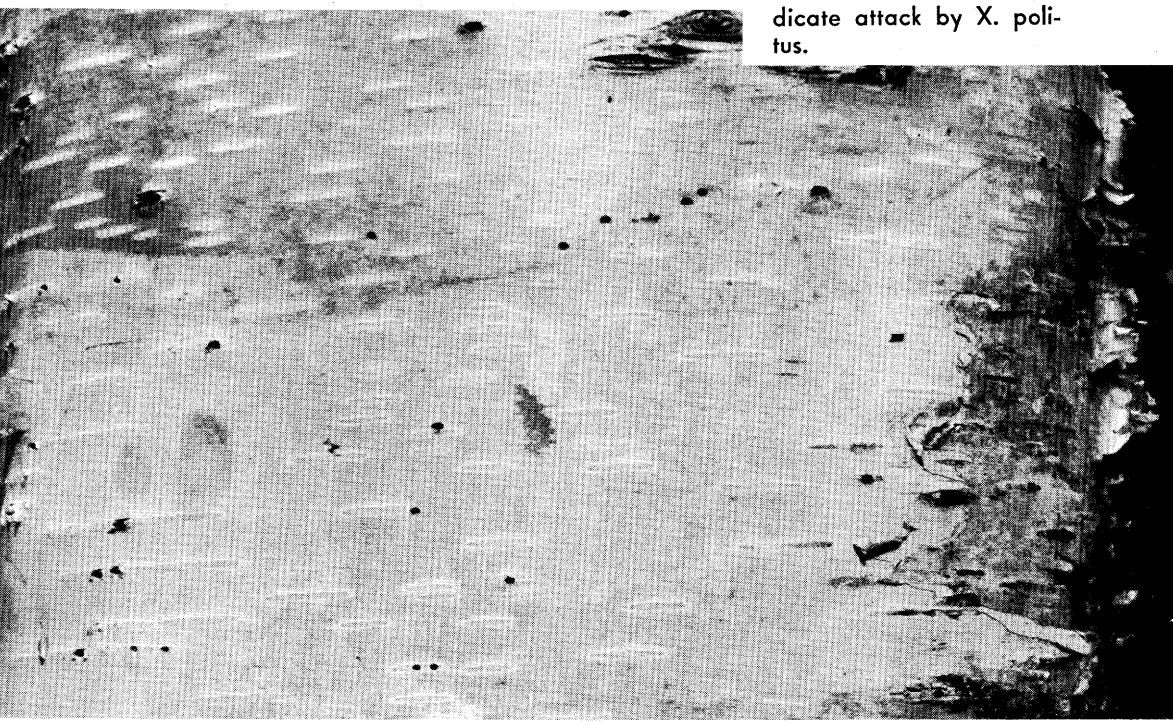


Figure 3. — Small islands of discoloration associated with a light infestation of X. politus.

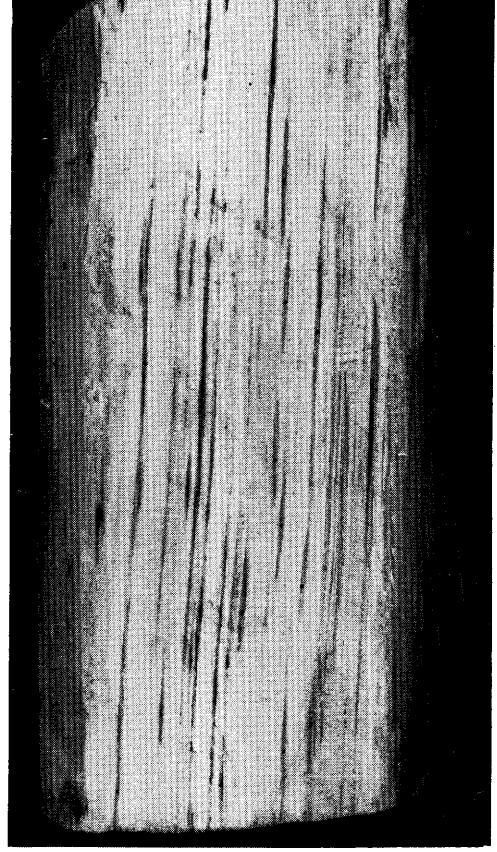


Figure 4. — Cross-section of islands of discoloration. The wood that formed subsequent to infestation remained white, while the wood present at the time of infestation was a dull pink (except the dark red-brown central discoloration that was present before insect attack).

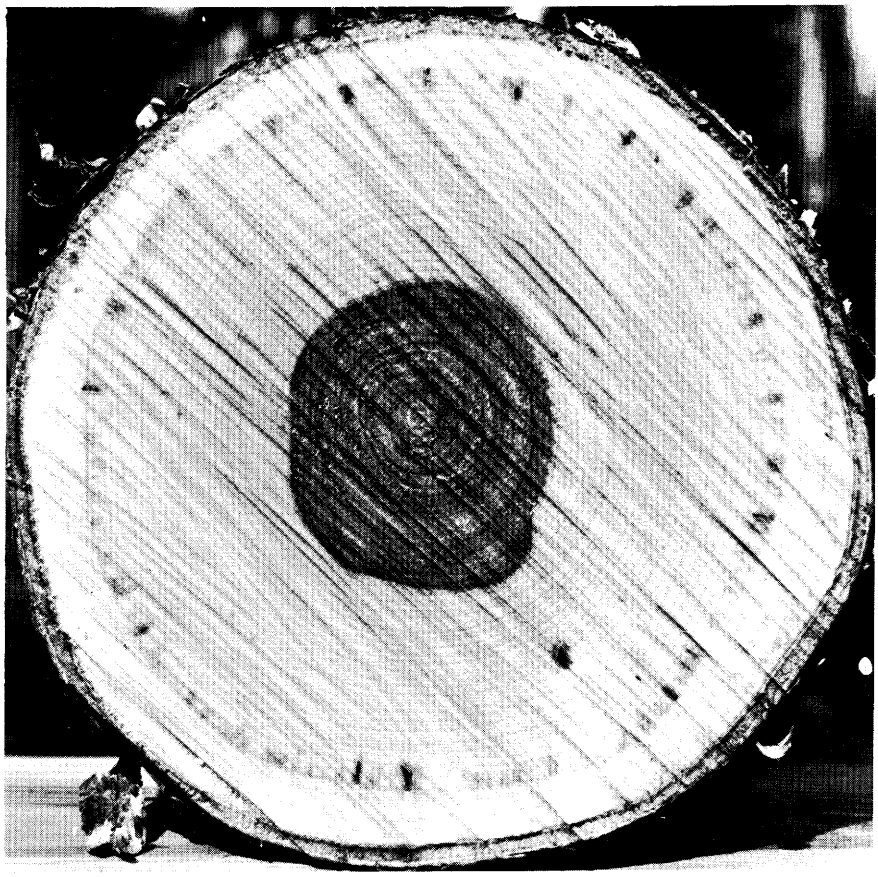


Figure 5. — A jagged pattern of defect associated with a medium infestation. The injured annual ring is distinct in the lower samples. Small dots of discoloration in the upper sample indicate a light recent infestation.

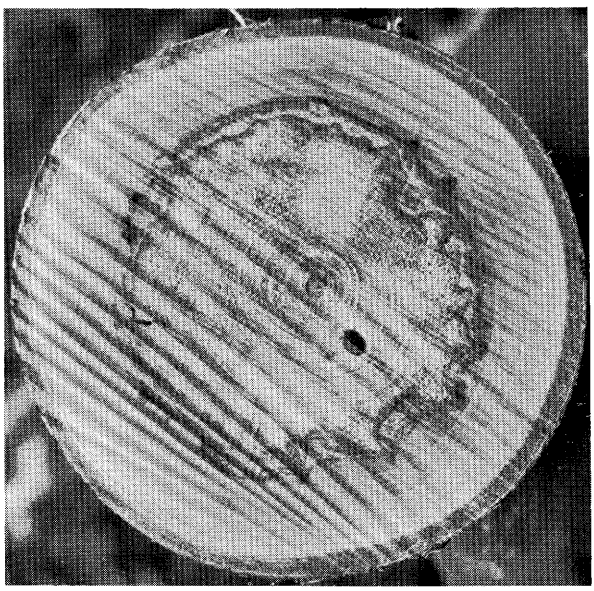


Figure 6. — Decay and discoloration associated with a severe infestation. A circular pattern resulted when the defects joined.

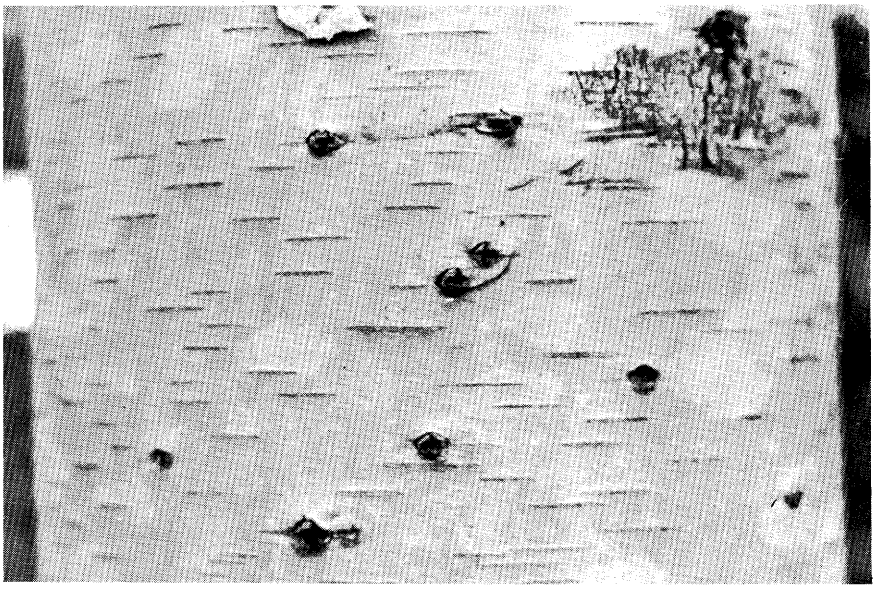
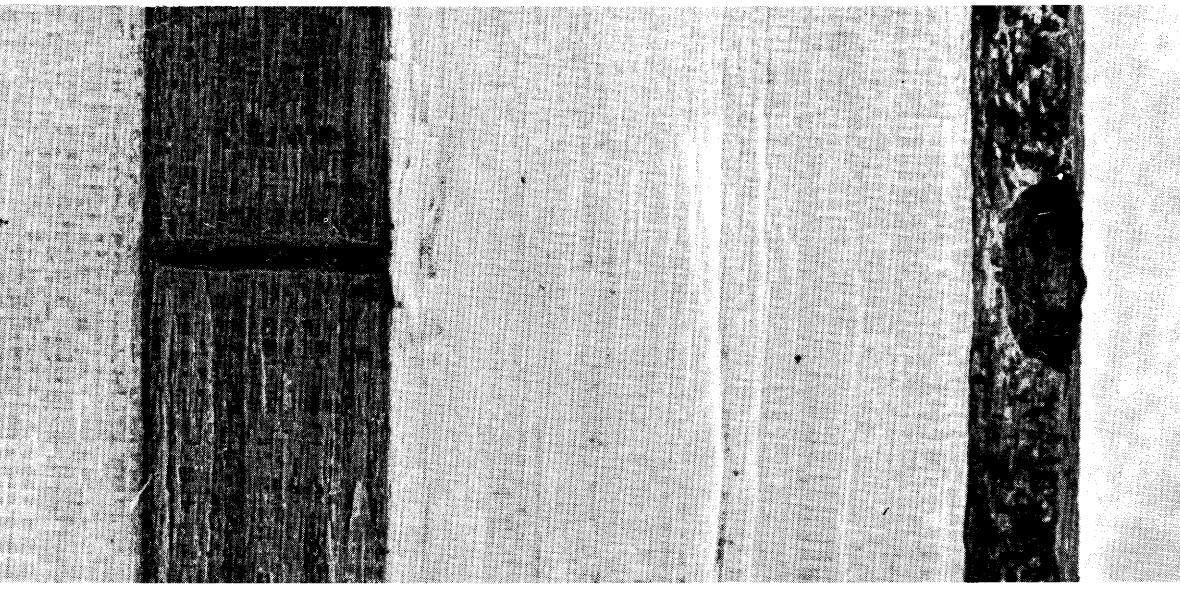


Figure 7. — Nodule-like growths of callus tissue around beetle holes inflicted 40 years ago.

Figure 8. — In this radial view of a sectioned tree, an excavation formed by the removal of the bark nodule around the beetle hole, made over 40 years ago and subsequently carried outward on the bark, is directly in line with the gallery now deeply buried within the tree. The radial extent of the discoloration conforms to the length of the gallery. In cross-sections such discolorations appear as spindle-shaped islands (see figs. 4 and 5).



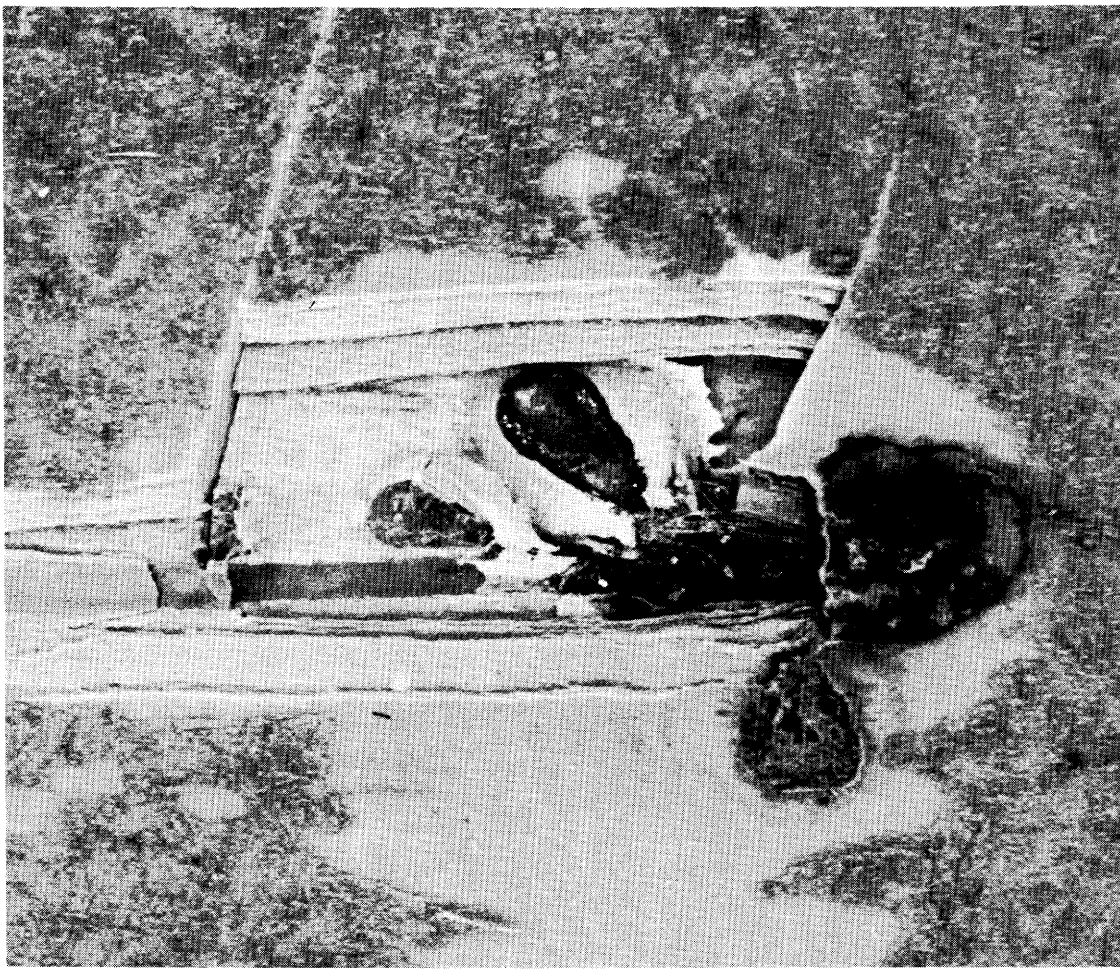


Figure 9. — A Xylococculus betulae colony that gained entrance to the inner bark through the beetle hole in the lenticel.

infestation) (fig. 5); and (3) continuous patterns, forming a circle in cross-section and sometimes including decay (severe infestation) (fig. 6).

Beetle holes in lenticels are carried outward on the bark as the tree grows and can remain visible for over 40 years (fig. 7). They serve as reliable signs of internal defect (fig. 8), and the number of holes serves to indicate the extent of defect.

The defects are compounded when the holes are inhabited by the scale insect, *Xylococculus betulae* (Perg.) Morrison (fig. 9). These insects expel their saccharine excrement through long wax tubes that protrude from their bodies out through the holes in the bark. Their feeding

retards the healing processes. Woodpeckers searching for scale insects as food further disrupt the healing processes when they tear the bark to expose the insects.

The patterns of defects described here are similar to those occurring in sugar maples (*Acer saccharum* Marsh.) that have sapstreak disease. Observations by the author suggest that ambrosia beetles play a role in sapstreak disease of maples also.

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