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A DEFINITION OF THE BEST PRUNING POSITION, reviewed by D. Lonsdale

Summary

Recent work in the USA has led to the formulation of a pruning technique which appears to minimise the development of decay beneath pruning wounds. The technique involves the retention of the 'branch bark ridge', an external feature which is readily visible at trunk/branch junctions of most trees. An article illustrating the technique is appended.

Introduction

1. It is now widely acknowledged that the risk of decay developing beneath a completely flush pruning wound is greater than that beneath a wound which leaves part of the branch base intact. Equally, it has long been established that the retention of a long stub is likely to encourage decay in the main stem. Despite the realisation that some sort of 'happy medium' is desirable, the precise position of the correct pruning cut has been largely a matter of guesswork. Moreover, the term 'flush cut' is still often used in advisory literature, including British Standard No. 3998 (1966).

An Anatomical Approach

2. The living sapwood cells of a tree react to injury and to microbial invasion by laying down chemical barriers which limit the extension of staining and decay. In the case of a severed branch, the barrier tends to form across the branch base, in a plane which can be anatomically defined. This anatomical plane is the region where cells derived from the branch cambium meet those derived from the main stem cambium. These cambia are at an angle to one another, and the apex of the angle is usually associated with an externally visible ridge, the 'branch bark ridge'. Recent work by Dr Alex Shigo of the US Forest Service has led to the suggestion that this ridge should be used as the guide to the correct pruning position. This approach has the attraction that the precise position need not be left open to guesswork.
3. In order to make Dr Shigo's ideas available to those concerned with the prevention of decay in amenity trees in the UK, a copy of one of his recent articles is appended herewith. Although this article represents our current understanding of the reactions of trees to wounding, more research is needed in the same areas. These include the influence of season of pruning on the tree's defence mechanisms and the need to define more precisely the kinds of paint (whether sold as tree paints or house paints) which should not be used on pruning wounds, even for cosmetic purposes.

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The Arboricultural Advisory and Information Service provides advice and information about trees based on research results and experience, both national and international, to arboriculturists, landscape architects, the construction industry and other professionals, also to private individuals. The service is funded by the Department of the Environment.

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A Pictorial Primer for Proper Pruning

By Alex L. Shigo

follows on the next page

Proper pruning is not a cure-all for trees. Proper pruning is the best thing you can do for your tree; improper pruning is the worst thing you can do to your tree. Much of what is done to some trees cannot even be dignified by calling it pruning.

There are two parts to this story. Some people do not care; they only want to cut the tree back. How they do it is not important. Some people do care; they want to maintain a safe, attractive, and healthy tree by pruning it in the best way possible. I should like to address my comments to the second group.

I believe that trees came with a full set of instructions. Our task in research is to learn how to read the instructions.

As a tree grows it sets buds at the end of the growth season that will become the new growing points for the next growing season. There are many types of bud positions, but one bud usually becomes dominant, and the others are subdominant. The dominant bud becomes the leader and the subdominants become the branches.

As the dominant and subdominant shoots grow, they separate themselves by a hard woody tissue, which becomes obvious in the bark as a slightly raised ridge. This is the branch bark ridge, the tissue separating the branch from the main stem. The branch bark ridge is your guide to proper pruning. Place the shears or saw in front of the ridge and cut downward and slightly outward.

Then you will remove the branch and not injure the main stem. The same procedure should be used for pruning smaller branches from a longer branch. There is another important reason why such cuts should be made. As the branch begins to wane, the tree begins to form a protective layer in the wood around the base of the branch. This tissue is called the branch collar.

A cut behind the branch bark ridge will not only injure the main stem, but it will remove the internal chemical protective layer. When this layer is removed by a cut flush with the stem, the tree-inhabiting microorganisms have easy access to the wood above and below the branch. Internal cracks may also result from such harsh cuts. The cracks may split outward later in the life of the tree.

In summary, with hardwoods and conifers, do not injure or remove the branch collar on living, dying, or dead branches. Do not paint the wound, unless for cosmetic reasons. And, if you do, use a very thin coat of some commercial material. Do not use house paints. The best time to prune most trees is at the end of the dormant period. If possible, avoid pruning during the time leaves are expanding. For more on pruning and the consequences of improper pruning, contact the author.

A Pictorial Primer For Proper Pruning

By Alex L. Shigo



Figure 1. Improperly pruned branches covered with wound dressing. Improper pruning is the worst thing you can do to a tree. Wound dressings do not prevent decay.

Reprinted from the Spring 1982 Issue of Forest Notes, a publication of the Society for the Protection of New Hampshire Forests.

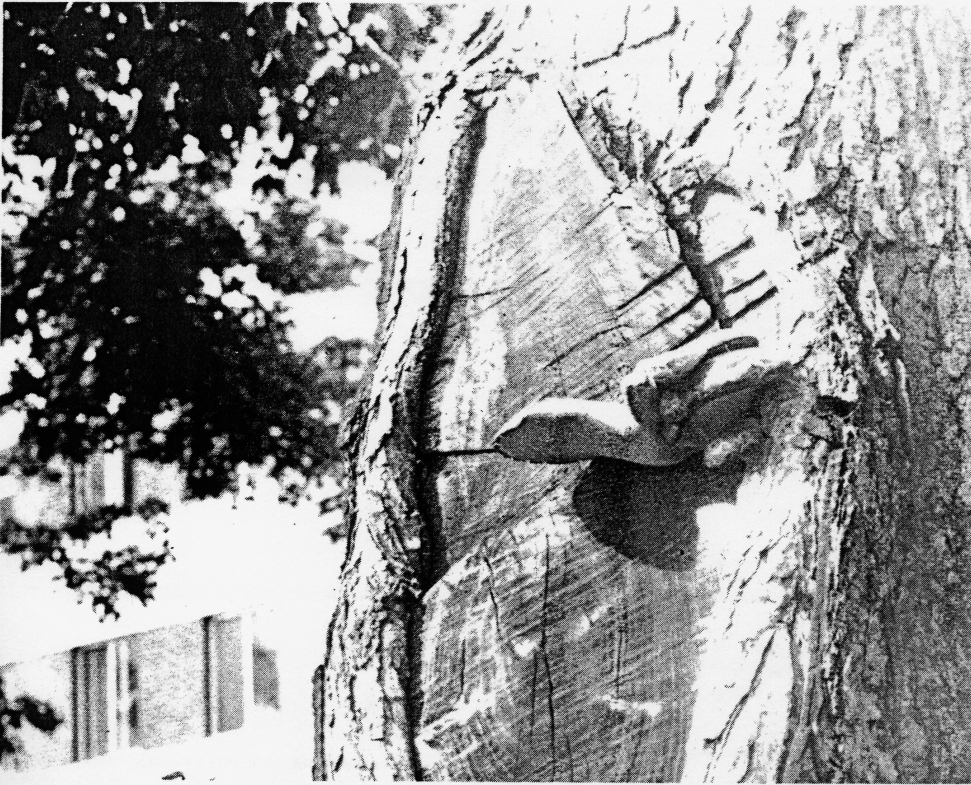


Figure 2. A large fruit body of a decay-causing fungus on a well painted old branch wound. Harsh close cuts, or flush cuts, cause serious injury to trees.



Figure 3. Flush cut branch on a young oak. Flush cuts covered with wound dressing have been the recommendation for pruning for over a century. There are no scientific data to support benefits of such treatments.



Figure 4. Branch bark ridge (arrow A), and branch collar on Aspen. Proper pruning starts by identifying the branch bark ridge and branch collar. On living, dying, or dead branches, do not make cuts behind the branch bark ridge. Do not injure or remove the branch collar. Do not leave a stub. Do not paint the wood. Proper cut is along the line shown (arrow B).



Figure 5. Dead branch on oak. The angle for a proper cut becomes obvious as branches tie (line A). When pruning living and dead

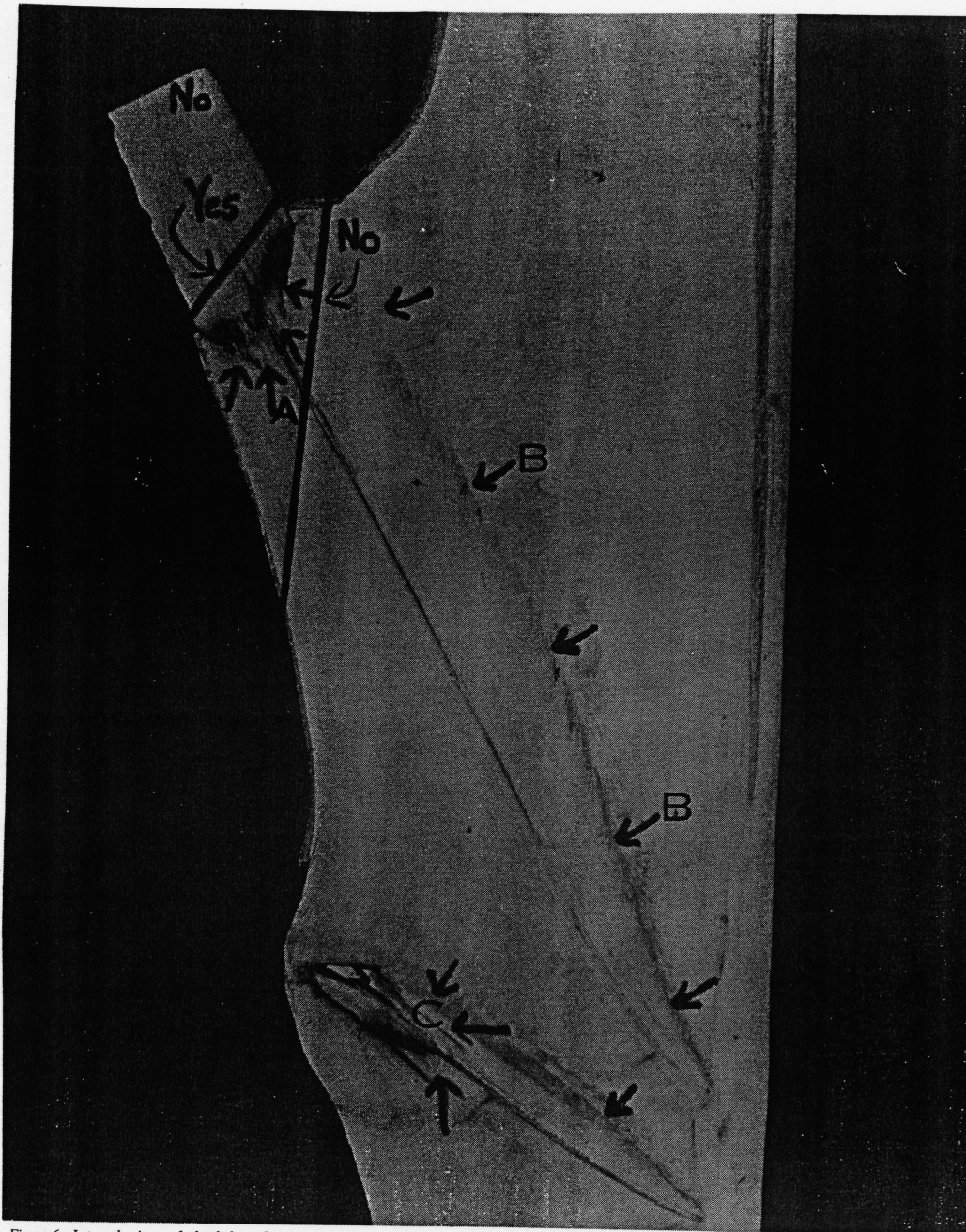


Figure 6. Internal view of dead branch on red maple. The beneficial fungi that were decaying the dead branch did not spread beyond the chemical protective zone within the branch collar (arrows A). Removal of the collar removes the zone. Arrows B show the internal boundary of the branch bark ridge. Arrows C show a walled off small stub. Some decay is necessary at the branch base before shedding takes place. But the decayed wood is walled off.

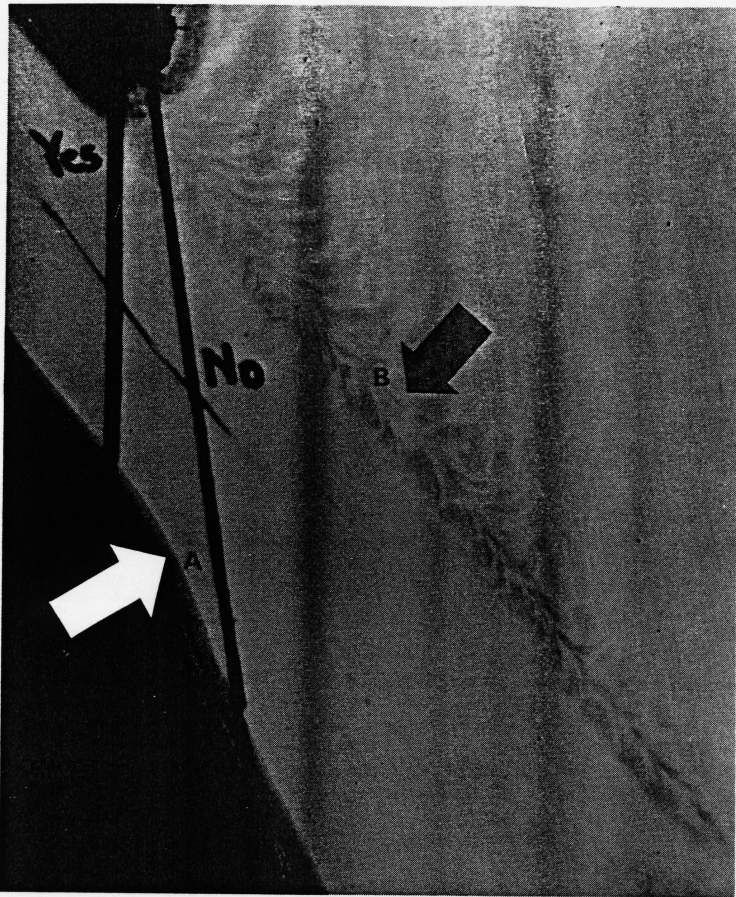


Figure 7. Internal view of living branch on birch. Note the slightly swollen branch collar (arrow A), and the internal boundary of the branch bark ridge (arrow B).

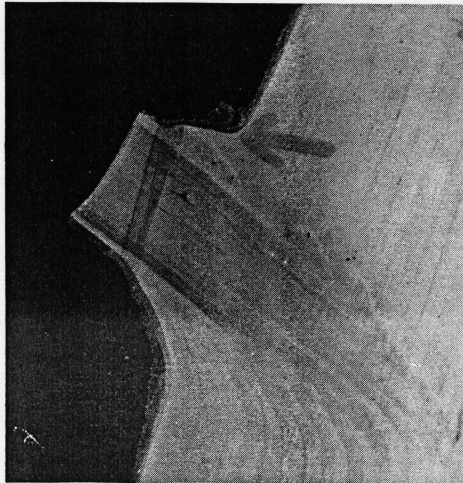


Figure 8. Internal view of branch on red pine. Arrow shows branch bark ridge. Line shows angle of proper cut. Note swollen branch collar. Do not leave stubs.

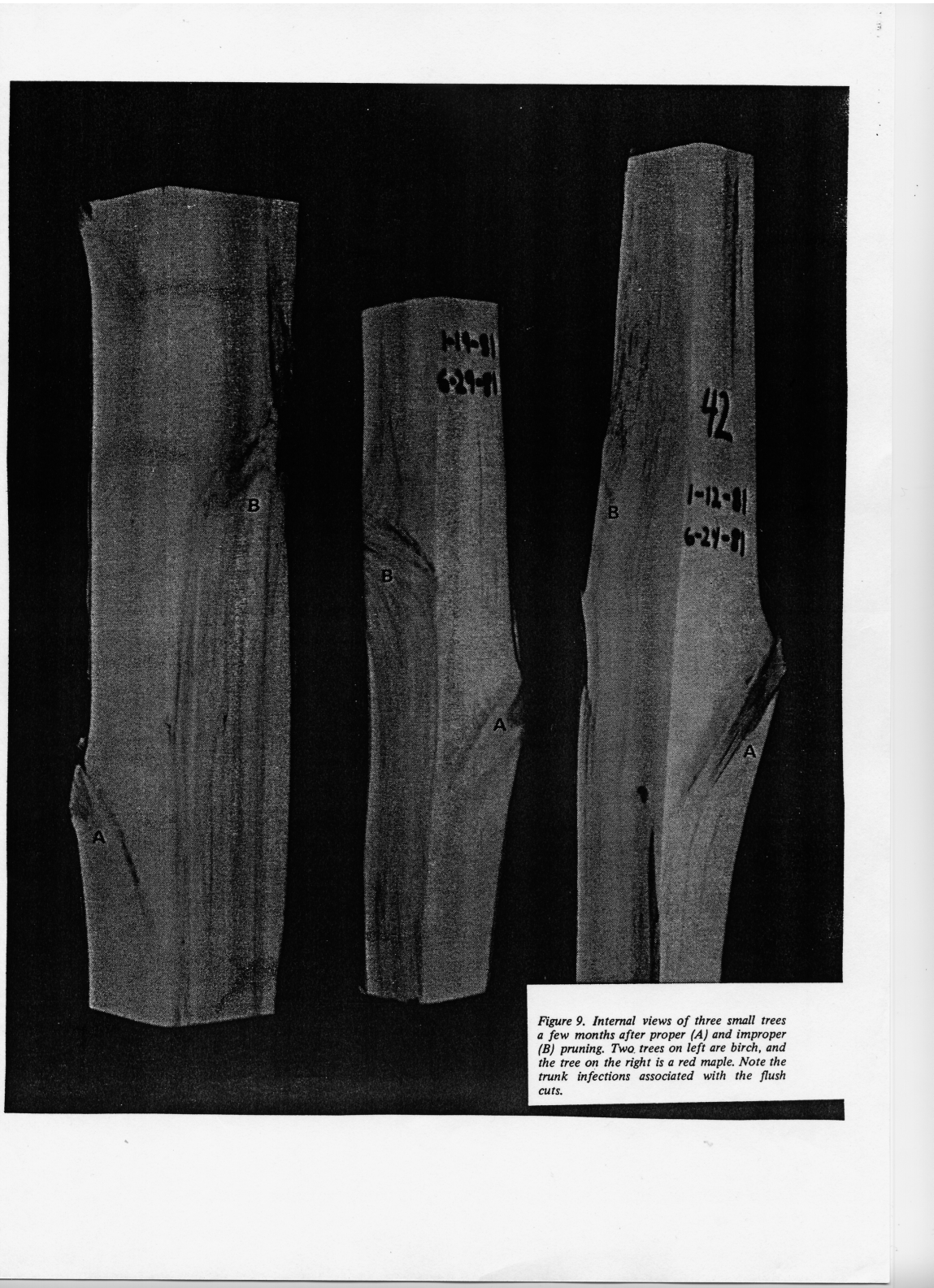


Figure 9. Internal views of three small trees a few months after proper (A) and improper (B) pruning. Two trees on left are birch, and the tree on the right is a red maple. Note the trunk infections associated with the flush cuts.

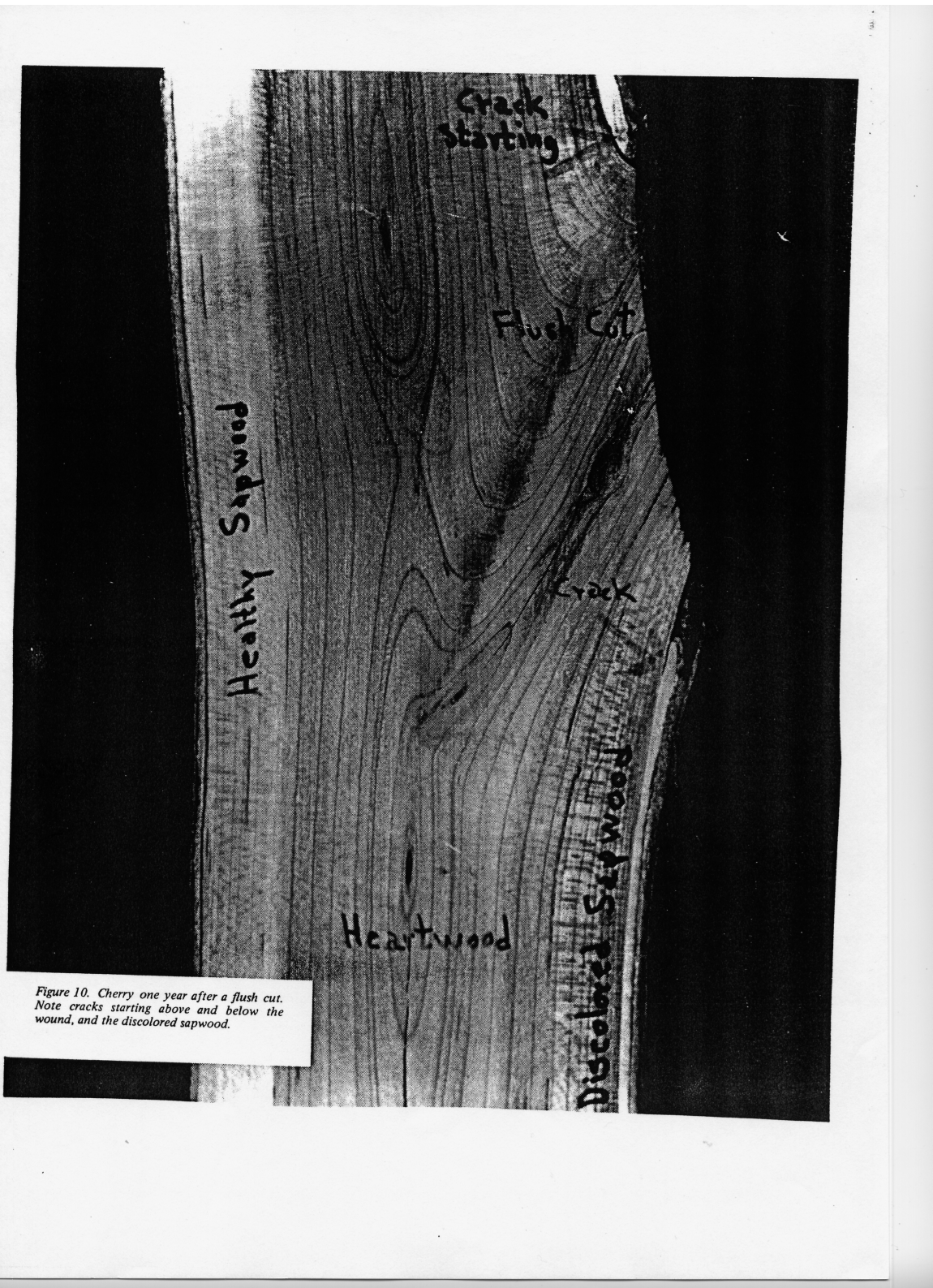


Figure 10. Cherry one year after a flush cut. Note cracks starting above and below the wound, and the discolored sapwood.

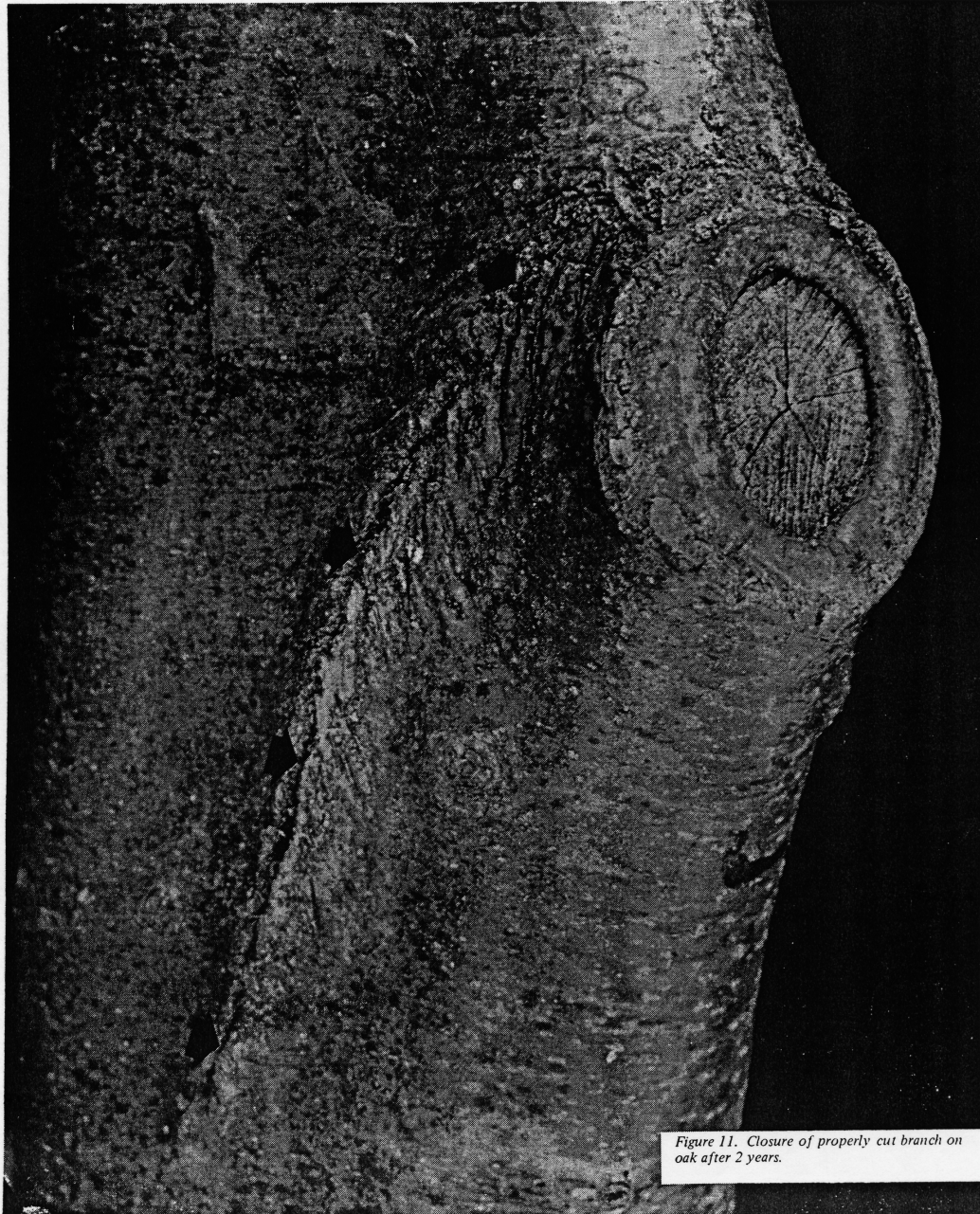


Figure 11. Closure of properly cut branch on oak after 2 years.

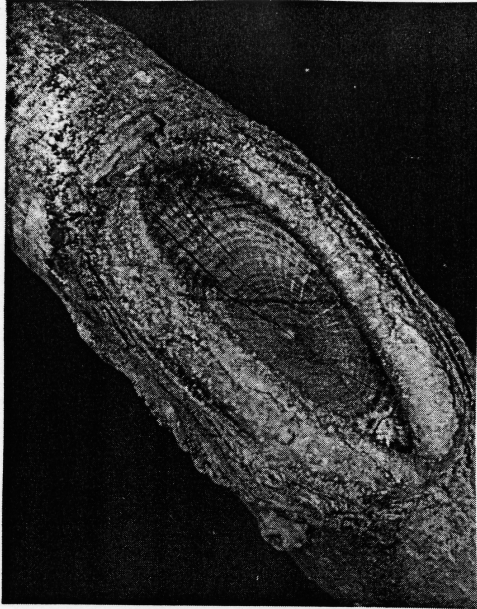


Figure 12. Closure of improperly cut branch on oak after 2 years. Thick callus forms on the injured trunk.

Chief Scientist of the US Forest Service's Northeast Forest Experiment Station in Durham, NH, Alex has been in the state since 1959 ("pruned a lot of trees in that time"). Hailing from Pittsburgh, Pa., he attended Waynesburg College, Pa., then obtained Master's and Doctor's degrees in the physiology of plant fungi, West Virginia U. His working title is tree pathologist. He has played the clarinet in symphonic and jazz organizations, and played in the top-drawer US Air Force Band while in service. One of his long-term interests has been to promote the good health of trees, rather than being preoccupied only with what attacks them. He has written for this magazine in the past and has published more than 230 papers in his field.

Request these germane publications from U.S. Gov't Printing Office, Washington, D.C., 20402, enclosing check: A Tree Hurts Too \$1.30; Your Tree's Trouble May Be You 90¢; RX for Wounded Trees \$1.35; Compartmentalization of Decay in Trees \$1.85; Tree Decay, An Expanded Concept \$2.75; Photo Guide to the Patterns of Discoloration and Decay in Living Hardwood Trees \$2.65. Request from NE Forest Experiment Station, Information Services, 370 Reed Rd., Broomall Pa. 19008 (215-461-3104). For more info on technical details and other publications, write Dr. Shigo, or Dr. Walter C. Shortle, NEFES, Box 640, Durham 03824. There is also a free short bulletin (Fact Sheet 12) available from the Cooperative Extension Service, Pettee Hall, UNH, Durham, N.H. 03824.