

**Tension wood at the branch-stem connection:
Is there a possibility to detect human manipulations?**

Michael Grabner¹, Hans Reschreiter²

¹ Department of Material Sciences and Process Engineering,
BOKU University of Natural Resources and Applied Life Sciences Vienna, Vienna, Austria
(Michael.Grabner@boku.ac.at)

² Natural History Museum Vienna

In the bronze-age and Hallstatt-period the handles for pickle axes were prepared from tree trunks (mainly beech) using the branch-stem connection. The handle itself was split-off the outermost trunk. A certain angle between trunk and branch is necessary to produce perfect handles, which is about 30°. Just a few branches out of a beech tree present this optimal angle. As these handles were used for a lot of different tools (for mining, for felling of the trees and so on), a huge number of these branch-stem connections were necessary.

Due to the high knowledge in handicrafts etc. it would be possible that the prehistoric people manipulated the branches of the beech trees. If the angle was too steep, bending by tying down a stone at the branch would optimize the angle of the stem-branch connection.

Would it be possible to detect such manipulations by – for example - increased rates of tension wood?

Tension wood at the branch-stem connection:



Is there a possibility to detect human manipulations?

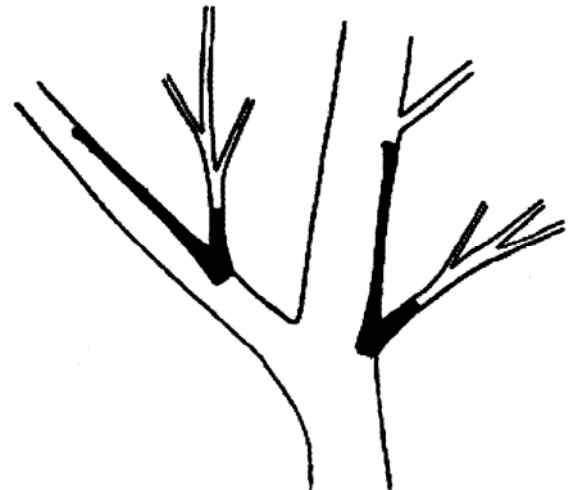


Universität für Bodenkultur Wien
Department für Materialwissenschaften
und Prozesstechnik

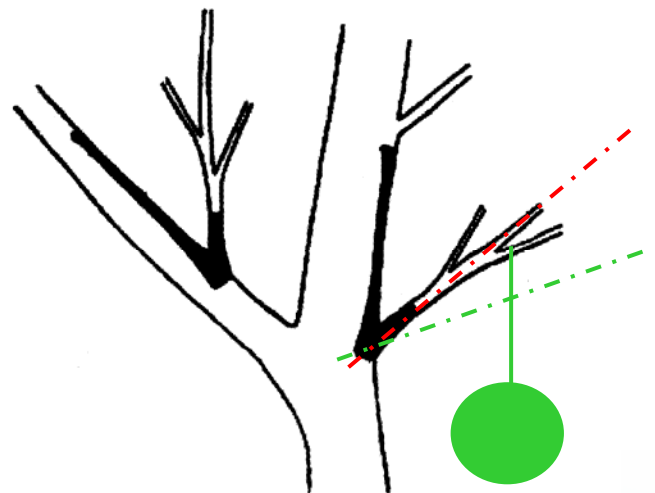
Michael Grabner¹, Hans Reschreiter²

Introduction

In the bronze-age and Hallstatt period the handles for pickle axes were prepared from tree trunks (mainly beech) using the branch-stem connection. The handle itself was split-off the outermost trunk (see figure). A certain angle between trunk and branch is necessary to produce perfect handles, which is about 30°. Just a few branches out of a beech tree present this optimal angle. As these handles were used for a lot of different tools (for mining, for felling of the trees and so on), a huge number of these branch-stem connections were necessary.



Due to the high knowledge in handicrafts etc. it would be possible that the prehistoric people manipulated the branches of the beech trees. If the angle was too steep, bending by tying down a stone at the branch would optimize the angle of the stem-branch connection.



The question

Would it be possible to detect such manipulations by – for example - increased rates of tension wood?

The problem

The availability of the material is restricted!

Any suggestions would be welcome!

¹ Department of Material Sciences and Process Engineering, BOKU University of Natural Resources and Applied Life Sciences Vienna, Vienna, Austria (Michael.Grabner@boku.ac.at)
² Natural History Museum Vienna