

## Topic Page: [Dendrochronology](#)

Definition: **dendrochronology** from *Philip's Encyclopedia*

Means of dating archaeological remains by examination of the annual rings in trees. It is used to calibrate other dating methods. Chronology based on the bristle-cone pine extends back more than 7000 years.



Image from: [There are highly specific cultural connotations... in Encyclopedia of Environment and Society](#)

### Summary Article: **dendrochronology**

From *The Hutchinson Unabridged Encyclopedia with Atlas and Weather Guide*

Analysis of the annual rings of trees to date past events by determining the age of timber. Since annual rings are formed by variations in the water-conducting cells produced by the plant during different seasons of the year, they also provide a means of establishing past climatic conditions in a given area.

Samples of wood are obtained by driving a narrow metal tube into a tree to remove a core extending from the bark to the centre. Samples taken from timbers at an archaeological site can be compared with a master core on file for that region or by taking cores from old living trees; the year when they were felled can be determined by locating the point where the rings of the two samples correspond and counting back from the present.

Moisture levels will affect growth, the annual rings being thin in dry years, thick in moist ones, although in Europe ring growth is most affected by temperature change and insect defoliation.

In North America, studies are now extremely extensive, covering many wood types, including sequoia, juniper, and sagebrush. Sequences of tree rings extending back over 8,000 years have been obtained for the southwest USA and northern Mexico by using cores from the bristle-cone pine *Pinus aristata* of the White Mountains, California, which can live for over 4,000 years in that region. The dryness of the southwest USA has preserved wood in its archaeological sites. In wet temperate regions, wood is usually absorbed by soil acidity so that this dating technique cannot be used.

Dendrochronology was pioneered by the US astronomer Andrew Ellicott Douglas (1867–1962) in 1935 when he recognized that the annual growth rings in timber of the semiarid areas of Arizona and New Mexico were an accurate record of past climatic variations. Ring-width variations in pine construction beams at the first site studied, Pueblo Bonito, were distinctive and to be found in many other prehistoric sites in that region, so contemporary building phases could be cross-linked.

In Europe, the German hill oak *Quercus petraea* has been used to develop chronologies in the Spessart region back to the 9th century and in the Schleswig region to the 14th century. A Hanseatic merchant ship, the *Bremer kogge*, has been dated by its timbers, which were floated down to Bremen harbour from Weserbergland in the south. The ship was still being fitted out in 1380 when it broke its moorings and sank. Oak from the Antwerp region has been used to date panel paintings by the Flemish artist Rubens. The softwood silver fir *Abies alba* has also been used to date sites in the Tyrol, Austria, over 1,000 years old.

## weblinks

Ancient Bristlecone Pine

### **APA**

Chicago

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dendrochronology. (2018). In Helicon (Ed.), *The Hutchinson unabridged encyclopedia with atlas and weather guide*. Abington, UK: Helicon. Retrieved from <https://search.credoreference.com/content/topic/dendrochronology>

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## Chicago

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## Harvard

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## MLA

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