

# DENDROCHRONOLOGY

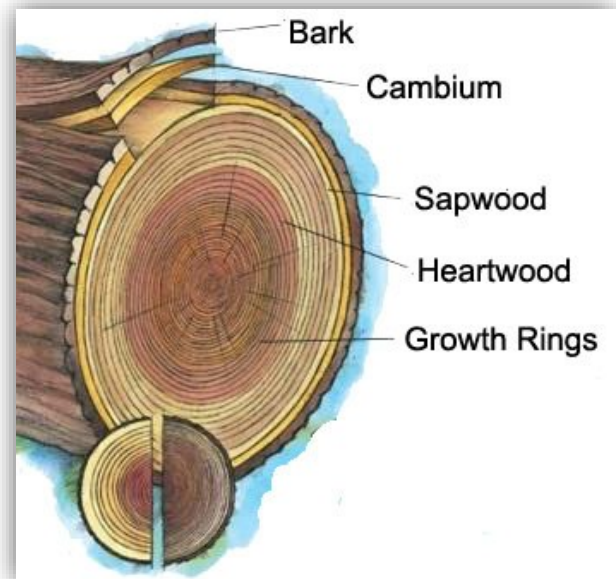
For centuries, scientists have been intrigued by the information to be gained from the growth rings of trees. As living organisms, trees set down layer-by-layer a record of their lives and the environment where they grow.

When trees become larger, they do so by rising in height, but they also increase their diameter by growing new outer layers of wood in an annual cycle. The layer just below the bark is a vascular cambium whose cells multiply and expand depending on ambient conditions, including temperature, humidity, windiness, but especially precipitation.

In the springtime, growth is faster and new cells are less dense (called “new wood”) but as summer comes on, growth slows down and the rings become darker and denser (“late wood”). In winter, growth comes to a stop, leaving a single year’s ring as a lasting remnant.

## READING THE RINGS

In temperate climates, annual rings are laid down virtually every year though occasionally rings are missing, as during insect defoliation. Uncommonly, a second or false ring may be deposited in a single year.



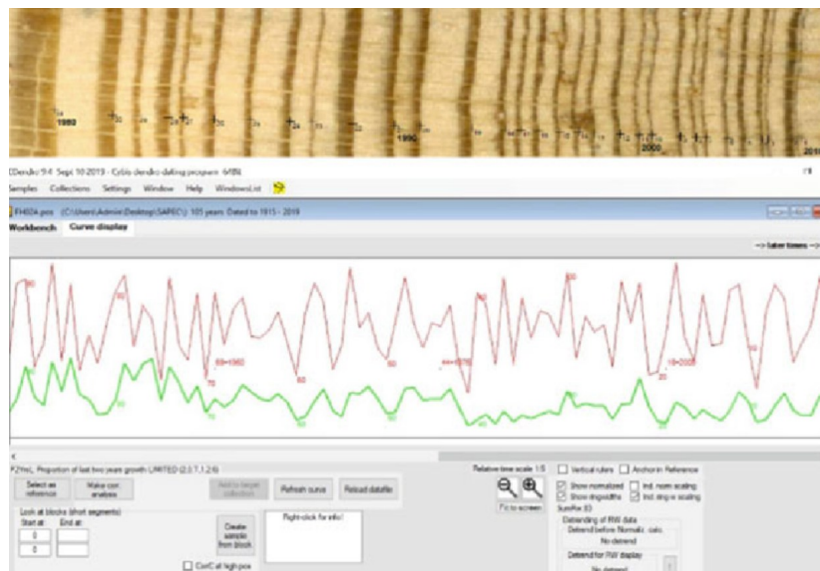
Today, there are so many hundreds of records available for a particular tree species and for a particular region that these oddities are easily identified as aberrations.

Each tree species behaves uniquely to its environment, but, for a particular climatic region, the fluctuations in ring size and density become a singular record of the past. Since each ring is very slightly different from the next, a record of these changes for a long series of years provides a template against which new samples can be matched.

Until the recent past, dendrochronologists have had to track these variations by visual measurements. Today, however, computer algorithms can measure changes more accurately and can integrate them into a huge database of metrics gleaned from prior studies.

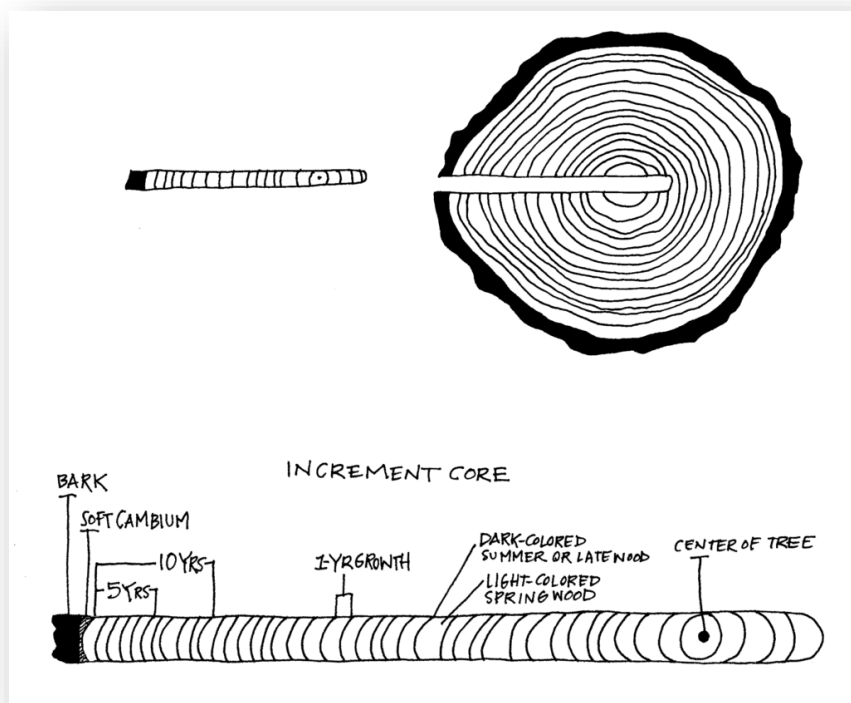
## DATING THE WOOD

Architectural historians use dendrochronology to establish when a tree was cut. From this they can estimate the age of structures. But to do so, they must be able to identify the last tree ring in the materials they study. The rounded surface just below the bark is called the “waney edge” and must be identified before core samples of wood can provide an “end date”.



Ideal samples are obtained with a hollowed drill called an increment borer directed perpendicularly from the waney edge toward the wood’s center.

There are now extensive records from samples along the East Coast to which new samples can be compared.



The “end date”, however, tells when the tree was felled and not necessarily when it was used in construction or reused.



## DENDROCHRONOLOGY RESULTS FOR THE GATE HOUSE

The Somerset County Historical Trust is particularly interested in telling the story of its most recent project, restoring the South Gate House of the Teackle Mansion. The building was one of two homes traditionally associated with the Mansion. We feel that knowing when each house was built is fundamental to accurately explaining the human history associated with it.

The Trust hired dendrochronologist Michael Worthington of Oxford Tree-Ring Laboratory in Baltimore ([www.dendrochronology.com](http://www.dendrochronology.com)) to analyze and date the wooden structures in the Gate House.

Already, our investigations confirm that the South Gate House was built at different times, in stages, and by different builders. The beams and smaller materials in the front of the house were pit-sawn and adzed, techniques used before the middle of the 19th century.



Pit-sawn floor joist

The lumber used was yellow pine, and dendrochronology has established that the trees were felled in the winter of 1816-1817. This corresponds to the second building phase of the Teackle Mansion around 1818.

The structure attached to the rear of this section remains a mystery. It was certainly built in an early time. Its beams were also shaped by pit-sawing and adze and are of similar size to materials in the adjacent section.

But the material used was not pine! It was poplar. For technical reasons, poplar is more difficult to date than pine, and our dendrochronologist is still compiling data to arrive at a date.

We have good historical evidence that Littleton Dennis Teackle lived in one or both gate houses after he lost his fortune in the 1830's. Tax records show that he lived there with at least 4 "servants" until shortly before his death when the two gate houses and attached land along the Manokin River were sold in 1848. We know that Teackle in his lifetime owned as many as 20 black "servants", and we are early in our attempts to identify their names and relationships to at least some of them.

One must draw from multiple ancient sources to flesh out the humanity attached to these old buildings in our care. The public record has been a rich but incomplete resource. Dendrochronology is one more tool that we can use to flesh out the timeline of the house's story. Walls can't talk, but they can tell us when they were built and by whom. More to come ...



Dendrochronologist Michael Worthington taking sample from Gate House floor beams