Paul Artale 5.1.25

Review: Prof. Valerie Trouet, *Tree Story: The History of the World Written in Rings*, John Hopkins University Press, Baltimore, MA, 2020 (2022 edn.)

Pages: 246

Dendrochronology by a Woke Evolutionist

This is a solid introduction to dendrochronology (DC), a more obscure topic in chronology and Deep Time Evolutionism. The premise is quite simple; counting tree rings from core samples can reveal age, with the baseline assumption one ring grows in one year.

However, things are far from absolute, with false rings, missing, and damaged rings depending on unknown past conditions. As a result, DC cannot be considered an absolute dating method. and tree ring chronologies must always be anchored to present, known dates.

What detracts from the book is frequent wokeism, i.e., the climate change scam, an ignorance of geoengineering (e.g. expressing surprise at the Ridiculously Resilient Ridge off the West Coast, and echoing fantasies of 'space mirror' projects to block the sun a-la-Bill Gates), and current catastrophic CO_2 levels. This last point is strange as she presents contradictory facts like the Middle Age vineyards in southern England, and Antarctican forests.

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Prologue (pp. 1-7)

Dendroprovenancing is determining geographical origin of wood.

German oak-pine chronology supposedly covers 12,650 years.

I) Trees in the Desert (pp. 8-21)

Annual ring width is hypothesised to represent rainfall received in that.

Tree-ring series are data from a single sample.

Tree-ring chronology refers to crossdated tree-ring data from multiple trees or sites.

Charcoal with sufficient rings can be ring-dated.

II) I Count the Rings Down in Africa (pp. 22-)

The *cambium* layer represents the tree's woody growth; everything else is dead tissue.

Tree-ring coring extracts only a 0.2'' diameter core of the living cambium.

The pith is the oldest ring.

Dendroclimatologists select trees and sites whose yearly growth is primarily determined by yearly climate variations, are remote, and in sparse forests.

Temperature reconstructions are based on high-altitude trees, and drought reconstructions from the Mediterranean.

III) Adonis, Methuselah, And Prometheus (pp. 29-40)

Old tree qualities include: an untapered columnar stem; few and heavy branches; large exposed roots; dead top.

Tree height is determined by genes.

Old trees (over 250 years) look different from middle-aged (50-250) and to young (under 50).

Adonis on Mt Smolikas is 1,075 years old.

Root structures can be radiocarbon 'dated' at 10,000 years old.

Europe's oldest living tree could be Sweden's Old Tjikko, a 9,550 Norway

spruce (*Picea abies*).

Many monumental trees have lost their oldest core part to rot, making dendrochronology (DC) impossible. Instead, ages are extrapolated from presumed rates, *which differ tree-by-tree*!

Trees in harsh environments grow slowly (<1.5mm p.a.) and have hard, dense wood.

Fast-growers like *Eucalyptus* produce much *earlywood* (light wood in Spring).

Bristlecone pines (*Pinus longaeva*) stunt and twist as they age. The oldest in the Great Basin, western U.S.A., is 'dated' to over 5,000 years.

In the 1930s, 'Methuselah', 4,789 years old, was found in the Ancient Bristlecone Pine Forest in White Mountains, eastern California. Its location was not disclosed to avoid vandalism.

Prometheus, 4,862 years old, is on Wheeler Peak, eastern Nevada. It was cut down in 1964 to count its rings (by Don Curry)!

In 2012, a 5062-year-old bristlecone pine was found.

Crossdating dead wood to living tree chronology extends bristlecone pine chronology back to 6827 BC.

The America Southwest is the birthplace of dendrochronology.

Walker Swamp stumps in Washington, D.C., have remained *in situ* for '130,000' years.

IV) <u>And the Tree Was Happy (pp. 41-54)</u>

The first step is to glue cores into wooden core mounts, then sanding the 'cookies' incrementally from 80 to 1,200 grit (abrasive particles in^{-2}). 'Normal' samples are sanded at 400-800 grit.

Individual wood cells are visible under microscope; conifers are square-

shaped and neat-lined, broadleaf cells are intricate-patterned.

It is difficult to differentiate narrow rings from each other.
Trees grow fastest in spring, well-rested after winter.

Latewood cells in late summer and fall are small with thicker walls.

Sequence of large earlywood and small latewood mark out annual rings.

Trees that don't grow in seasonal climates, like the tropics, don't have distinct rings. These are challenging for dendrochronologists.

Teak (*Tectona grandis*) growth in the Amazons is interrupted each year by flooding, which causes anoxia and growth dormancy.

In semi-arid regions, trees get depressed and grow narrow rings in dry years.

Crossdating involves *visual* or statistical pattern matching.

Every tree ring signature is by definition unique.

A reference tree-ring chronology is anchored to present time, which are based on living tress with a known date fro the most recent ring. At least twenty trees are sampled for this.

Stress-resistant trees may simply skip forming an 'annual' ring. Conversely false rings can form under summer monsoon , or pre-spring drought conditions. Both of these seriously bring dendrochronology into question.

Quercus robur and petrea are the longest continuous chronology; the German samples number 6,775. The oldest living tree is 1,000 years old.

Petrification is claimed to take millions of years.

Increased CO_2 causes enhanced growth and wide rings, as deduced from petrified Antarctic wood.

V) The Stone Age, the Plague, and Shipwrecks Under the City (pp. 55-65)

Due to nuclear testing, radiocarbon of innermost rings of a 5,000 year old bristlecone pine will be only half the outermost ring.

A *crannog* is an artificial island in a Scottish lake or river.

Shipwrecks often yield timber for tree ring research.

VI) The Hockey Stick Poster Child (pp. 66-75)

DC is useful for the last 1,000-2,000 years as a climate proxy.

Maximum lakewood density is used as a proxy for past summer temperatures.

VII) Wind of Change (pp. 76-91)

Radioactive ^{10}Be has a half life of 1Ma and is formed from ^{9}Be via solar radiation. ^{10}Be gets deposited into ice so is part of core 'dating'.

In June 1991, Mt Pinutabo in the Philippines erupted into a 22mi ash cloud, which dropped global temperatures 1^{o}F over the following 1.5 years.

Withdrawal causes insomnia, aggression and irritability.

VIII) Winter Is Coming (pp. 92-98)

Monasteries in the south of England had vineyards in the Middle Ages.

At peak, Greenland had 95 farms and 1,000 inhabitants.

IX) Three Tree-Ring Scientists Walk Into a Bar (pp. 99-112)

Fish ear bones (*otoliths*) form datable growth bands, 'trees of the ocean' as such.

X) Ghosts, Orphans, and Extraterrestrials (pp. 113-128)

The Richter scale classifies earthquake magnitude based on seismic wave strength. The Modified Mercalli scale of 1-8 is based on tree disturbance (5 is slightly shaken, 8 strongly). Such events can permanently mark the wood cells, often long, narrow rings.

Western red cedars (*Thuja plicata*) in marshes can remain standing centuries after a quake.

In 1986, Chernobyl killed all trees in a 1.5mi radius; trees in the area took up radiosondes in their roots which caused strong ring suppression effects.

Radiation damage is characterised by dividing and merging patterns, as opposed to straight line growth.

DC reconstructions of climate change rely on independent and precisely dated past volcanic eruption records! Instead, Greenland and Antarctic ice core proxies are used, specifically, the SO_4^{2-} (g) captured in bubbles.

An AD 775 radiocarbon peak 20X background has been found in two Japanese cedars (*Cryptomeria japonica*). The likely candidate is a solar flare (also Solar Proton Event [SPE]). In ice cores, this event was seen as ^{10}Be spikes.

XI) Disintegration, or the Fall of Rome (pp. 129-138)

DC can use over 8,500 Roman building timber samples across Europe 2,400 years ago.

The *Volkerwanderung* was a Germanic and Hun migration into the Roman Empire leading to its downfall.

The Late Antique Little Ice Age occurred AD 536-660. 536 was likely the year of a large volcanic eruption.

XII) It's the End of the World as We Know It (pp. 139-150)

The Montezuma bald cypress (*Taxodium mucronatum*) can live to 1,000

years and span at least 37.5ft diameter.

XIII) Once Upon a Time in the West (pp. 151-164)

Arizona's Laboratory of Tree-Ring Research has 100,000 dated charcoal fragments.

XIV) Will the Wind Ever Remember? (pp. 165-180)

NAO is the North Atlantic Oscillation.

The jet stream is fast westerly wind which flows 5-9mi up, and means eastward transatlantic flights are an hour faster.

The North Atlantic jet stream is 52^{o}N.

XV) After the Gold Rush (pp. 181-197)

Wounded trees can only form wood around the injury, leaving resin and scars, as with bush fires.

Delicate scars can be destroyed by careless coring.

XVI) The Forest for the Trees (pp. 198-210)

In 1995, wooden spears were found in thick mud in an open pit of Schoningen coal mine.

18 postholes arranged in a 13ft circle have been found at Star Carr in North Yorkshire, 'dated' 9000 BC.
The Norse arrived in Iceland in 874, and within three centuries had cut down all the trees.

In the 1580s, King Felipe II deforested Aragon to build the Spanish Armada.

Glossary (pp. 217-224)

Age of Discovery: 15th-18thC.

Cambium: living tree cells between bark and wood.
Carbon fertilisation: plant capability to absorb more CO_2 as levels increase.

Cat face: fire scars left in the stem of a tree.

Crossdating: matching tree-ring characteristics among trees growing in the same region.

False ring: supposedly identifiable by ‘gradual’ as opposed to ‘sharp’ ring boundaries.

Floating chronology: DC which hasn’t been crossdated.

Flood ring: rings from flood events.

Frost ring: irregular cell shapes from frost damage.

Increment borer: tool to extract a core without causing tree injury.

Missing ring: detectable only via crossdating [what if the crossdated trees are also missing rings?].

Pointer year: tree ring years where they are abnormally narrow or wide.

Sclerochronology: growth patterns in hard marine organism tissue.

Snag: a standing dead tree.
“When the home deteriorates, a coalition often forms between the permissive parent and the out-of-control child, while the more authoritarian parent becomes isolated and increasingly frustrated.” [p163]

The real problem is often parental failure.