

The TREE of KNOWLEDGE

A blend of science and sleuthing, dendrochronology can reveal unsuspected facets of the maker's craft. PETER RATCLIFF explains how examining the tree rings on an Andrea Amati produced surprising results

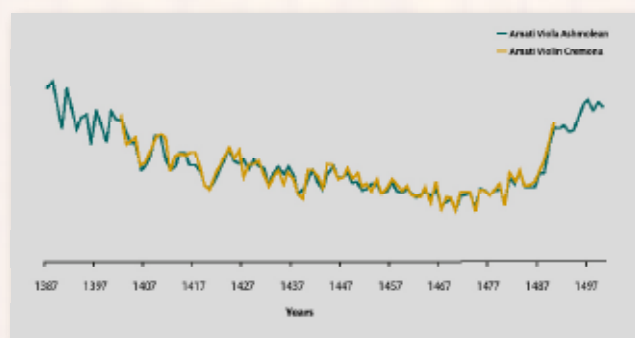
FOR ALMOST A CENTURY, DENDROCHRONOLOGY has been an essential tool in many fields of scientific research. The method of dating wood by studying tree-ring patterns has been employed by archaeologists, geographers and even astronomers, while historians and art critics have adopted the science to find the ages of ships and panel paintings. It is only quite recently, however, that the method has been used for the dating of stringed instruments – even though, with a little detective work, the method can reveal much more than just the age of the wood. Increasingly, researchers are discovering fascinating correlations and relationships between various instruments and schools of making, as well as significant insights into the workings of the old masters.

Working with my colleague and fellow violin maker John Topham, I took Andrea Amati's c.1566 'Charles IX' violin as the starting point for the research. One of four surviving Amati instruments made for the French king's court, the decorated violin is currently on display at the Palazzo Comunale in Cremona. In 2009 we obtained permission from the exhibition's curator, Andrea Mosconi, to take a series of macro-photographs of the violin for a full, thorough dendrochronological study. Our investigation unearthed a number of remarkable surprises.

Tree rings are made by the living cells that grow underneath the bark. As they multiply, the cells form a concentric tree

ring each year, gradually enlarging the size of the trunk. The obvious boundary between dark and light areas results from an increased concentration of cells forming towards the end of each growing season, which usually terminates fairly abruptly. The distance between rings fluctuates according to many factors, environmental and otherwise (such as the age of the tree), and the relative size of each consecutive ring forms the basis of the process of 'crossdating' – a much more reliable method than simply counting the rings. Crossdating involves taking a sample of tree-ring measurements and comparing them, ring for ring, with samples from trees that grew in the same geographical region and time period. Hence, this method can determine the age of the wood to the precise year.

During our analysis, we discovered numerous correlations between the wood used in the 'Charles IX' and the data obtained from the front of another Amati instrument, also part of Charles IX's set – the decorated viola in the Ashmolean Museum in Oxford. In fact, a comparison of the statistical and graphical results for both violins (**figure 1**) pointed to a 'same-tree match'.



▲ FIGURE 1 The close correlation between the tree rings on the 'Charles IX' violin and the Ashmolean Museum's Amati viola suggests the wood for both instruments came from the same tree

