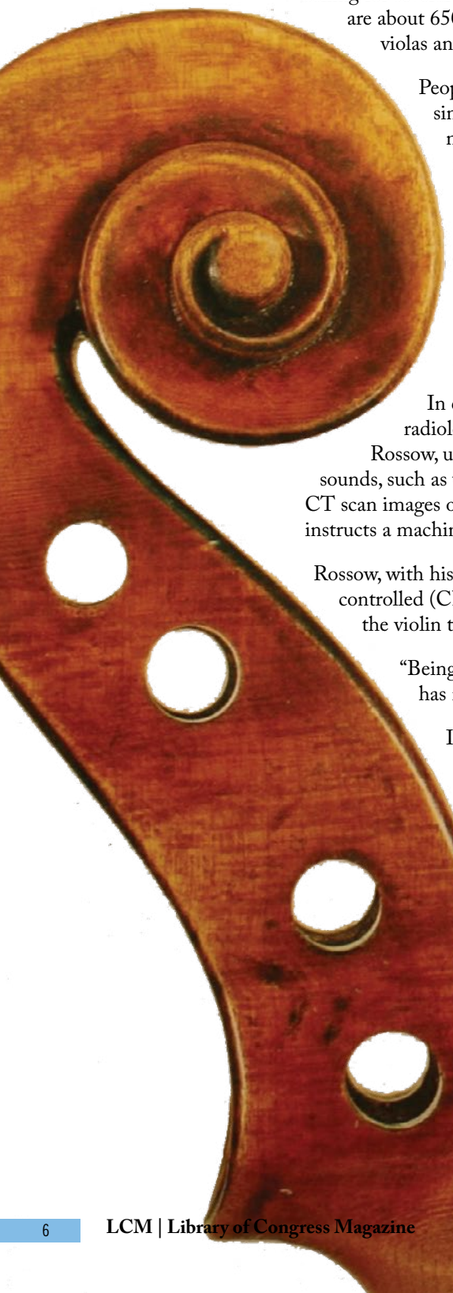
A STRADIVARI GOOD COPY

NEW TECHNOLOGY MAKES IT POSSIBLE TO CLONE RARE STRINGED INSTRUMENTS.



To say that a violin made by master luthier Antonio Stradivari (1644-1737) is priceless is an understatement. His are some of the finest stringed instruments ever made, often selling for several million dollars. Of the estimated 1,000 violins Stradivari made, there are about 650 still in existence. The Library holds three of them, as well as several violas and violoncellos he also made.

People have been copying these and other Stradivari instruments ever since they were first produced, often by taking measurements and making templates from the actual instruments or from images or measurements taken from books or posters. According to Carol Lynn Ward-Bamford, the Library's curator of instruments, the Library has been scanning its instruments for research purposes since 2006.

Recently, the Library acquired a copy, modeled after its "Betts" violin (1704), which is among the most legendary of those made in Stradivari's workshop. The copy was made rather unconventionally, using computed tomography (CT) imaging and advanced manufacturing techniques.

In collaboration with the Library's Music Division, Minnesota radiologist Steven Sirr, along with violin makers John Waddle and Steve Rossow, used CT images to study the characteristics that influence the violin's sounds, such as wood thickness, shape and degree of arching. More than 1,000 CT scan images of the "Betts" were produced and then converted to a program that instructs a machine to replicate those elements.

Rossow, with his friend Chris Ramirez, custom-built the computer numerical controlled (CNC) machine specifically for making such instruments. The parts of the violin that were made included the top, back, neck and scroll.

"Being able to make the same parts again and again will allow research that has not been possible before," Waddle said.

In collaboration with staff and participants in the 2011 and 2012 Violin Society of America's Oberlin violin-makers' workshop, a replica of the Betts was assembled and varnished by hand. What resulted was an instrument with a sound quality very similar to an original Strad, according to Sirr, who is also an amateur violinist. The replica was donated to the Library by William Sloan, a member of the Violin Society of America and participant in the workshop.

Since then, Rossow and Waddle have assembled and varnished other copies of the Library's Betts violin.

"People want to copy great works of art," said Ward-Bamford. "This technology has helped advance the process of making violins here in America and opens up endless possibilities for more study and collaboration."

—Erin Allen

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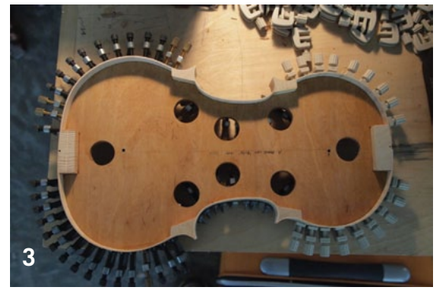

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1. The original Betts violin sits in its holding jig, ready to undergo X-ray computer tomography. The resulting CT scans will reveal the density of the woods and the volume of the air chamber.

2. A computer-controlled router, or CNC machine, accurately carves the scroll and top and back plates of the Betts violin copy.

3. Linings are glued to the sides of the Betts copy and held in place with clamps.

4. Violin maker Ralph Rabin trims the linings in the Betts copy by hand.

5. Participants in the Oberlin violin-makers' workshop compare the top plate of the Betts copy to the original Strad. Unless otherwise noted, all photos courtesy | *Oberlin Violinmakers' Workshop*

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6. William Sloan displays the copy of the Betts violin he donated to the Library in February. *Abby Brack Lewis*