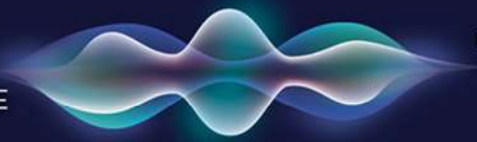




Conference **PROCEEDINGS**

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ISME
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Introduction

The beautiful sound. How can we define beautiful something that cannot be seen? For centuries everyone has defined the sound of Stradivari as beautiful, but no one can see it. To understand if a person in front of us is a friend, we rely on sight and hearing. If we recognize her voice or recognize her face, we can distinguish her from anyone else and greet her warmly. A violinist looking for a good instrument will appreciate that it is aesthetically beautiful but above all he will evaluate its sound and compare it with what he considers the ideal sound; for a musician that instrument will be a true friend, an adventure companion for the concerts of the future. Lutherie is the very art of creating beautiful musical instruments with a good sound, and everyone knows that the highest level was reached by some 18th century Italian luthiers such as Antonio Stradivari. The problem is that there are now only 650 instruments of him left in the world, not all of them are in good condition and they will not be eternal; moreover, they are few and very expensive. Hence, we need new violins of that same standard at reasonable prices, but first of all we need to train and educate a generation of high-level luthiers, capable of not only equaling but also exceeding the production standards of Antonio Stradivari. After all, it shouldn't be difficult to surpass in precision and efficiency the products of a XVIII century's craftsman who only worked well until sunset because he had no electric light in the house, and could only dream of a pillar drill or band saw, but there is a solution: the Conservatory of Santa Cecilia in Rome not only teaches how to play musical instruments but is also training a new generation of luthiers, considering with them not only classical but also experimental lutherie in order to reach and improve the acoustic performances of the new violins. A new education for future's luthiers.

Violin sound and Human voice: a specific goal

An interesting article, *Master Violins Designed to Mimic Human Voice (1)* by Tia Ghose, indicated how this was the aim of classical Italian lutherie from its beginnings: "The great violin makers, such as Stradivari and Guarneri, may have designed violins to mimic the human voice, new research suggests".

Effects of Visual and Auditory Feedback in Violin and Singing Voice Pitch Matching Tasks (2) is a research of an even more specific scientific level that explored these correspondences and indicated how listeners by the sound of the violin and the human voice receive very clear visual and auditory impressions.

For these reasons some composers have even written specific exercise books. For example, *The Integration of Violin and Voice for the Solo Performer: A Set of Exercises, Studies and Short Pieces (3)* by Cassandra Elizabeth Norton. In fact, she says "The violin has often been compared to the voice for its ability to connect with human emotions. Both violinists and vocalists have the ability to shape sound through pitch, timbre, dynamics and articulation, on a level as small as an individual note".

One study noted the renewed interest in the last century in works that combine the sound of the violin and the human voice; this confirms our thesis that the two are closely connected. I refer to the *Violin and Voice as partners in three early Twentieth-Century - English Works for Voice and Violin* by John Paul Rutland (4).

The today's reality regarding Stradivarius violins

The violin reached its definitive dimension in the 16th century having been initially conceived for small ensembles. Also in the Baroque era, even in the case of solo concerts, the violinist could easily emerge on other string instruments, that is, with limited acoustic performance. In the Mozart era the first winds (oboes and horns) began to be inserted in the orchestra and therefore, in the case of solo concerts, the violinist found it more difficult to emerge on all the other instruments present. From Beethoven, alongside the strings, the presence of wind instruments will expand (flute, 2 oboes, 2 clarinets, 2 bassoons, 2 horns, 2 trumpets and drums) until to include - in the Sibelius or Khachaturian violin concertos - the entire brass band (piccolo, 2 flutes, 2 oboes, English horn, 2 clarinets, 2 bassoons, 4 horns, 3 trumpets, 3 trombones, tuba, timpani, percussion (bass drum, snare drum, suspended cymbals, tambourine) and harp. In the same time an evolution happened among the wind instruments (originally many wind instruments were made of wood). This evolution of the orchestra's sound power required an equal evolution of the acoustic capabilities of each violin to be able to maintain a balance between the various sections of the instruments.

Another reason that led to a demand for more sound was the evolution of concert venues. At the beginning, Corelli's sonatas for violin were rightly called "chamber music" because it was performed in a room or, at most, in the hall of a building. The birth of theaters and concert halls required more and more sounds to offer more and more spectators the possibility of attending a show. Today, concert halls with a circular plan of up to 2000 seats are built.

For all these reasons the 18th century violins have been modified (neck, bass-bar, fingerboard, bridge height, etc.) and currently use modern strings in synthetic material designed to produce a more powerful sound, they use carbon fiber bows and recently synthetic horsehair is also available. The few Stradivarius violins still capable of being played retain little of their original appearance and use strings and bows that did not exist at the time of their birth. The evolution of the violin over time has been recognized by many researchers. Among the many I would like to mention:

- *Power efficiency in the violin – A New study identifies key design features that boost violins' acoustic power* by Jennifer Chu (5)
- *The evolution of air resonance power efficiency in the violin and its ancestors* by Hadi T. Nia, Ankita D. Jain, Yuming Liu, Mohammad-Reza Alam, Roman Barnas and Nicholas C. Makris (6)
- *The violin music acoustics from Baroque to Romantic* by John McLennan (7)
- *Violins evolved by Stradivarian design* by Colin Barras (8)
- *The Evolution of the Violin's Sound* by Julia Rothchild (9)
- *Imitation, Genetic Lineages, and Time Influenced the Morphological Evolution of the Violin* by Daniel H. Chitwood (10) where we can read: 'Numerous innovations on violin design have improved the acoustical properties and playability of violins'.

Looking for a better classical violin

It is surprising that today's luthiers already consider it a great achievement to be able to reproduce one of Stradivari's instruments. He only worked well during the day because he had no electric light in the house, therefore he could only dream of a band saw and a pillar drill. We now have the technology to go to the moon and send satellites to Mars, but are we unable to match a craftsman of 300 years ago? It is not true and it is not so. In fact, we already know everything about Stradivari and for several decades. An excellent book that explains many aspects of Antonio Stradivari's technique is The "Secrets" of Stradivari by

Simone Fernando Sacconi (11), a great expert. Eric Blot called it 'one of the important contemporary violin makers. His book explains the construction techniques used by Stradivari with clarity and precision. It is considered an indispensable reference for both the professional and novice violin maker.' Honestly, some of Sacconi's statements seem to be only his beliefs still in the state of hypothesis, but the amount of information is impressive and astounding.

If then almost all of the aspects are now known, why does eternal research on Stradivari's secrets continue to be conducted and financed? And why do journalists still tell the gothic tale of the mystery that surrounds the figure of Antonio Stradivari? The researches that continue today are self-referential and only serve to justify their existence and related costs; moreover, too many superficial journalists find it convenient to shout out Stradivari's secret just because their article will get more glances from curious but uninformed readers. The actual truth is different. Numerous experiments have already shown that contemporary violins of good lutherie are able to play even better than Stradivari.

Modern violin can be better than ancient one

The most serious research is certainly the Double-blind violin experiment conducted over the years 2010-2013 in Indianapolis, Paris and New York by a team of experts. I believe that the following articles are useful to understand the seriousness of the research:

- *Sound projection: Are Stradivarius violins really better? (12)* by Léa Peillon-Comby, Claudia Fritz
- *Blind playoff of Stradivarius violins and new ones leaves old Italians a little flat (13)* by Associated Press Report
- *Double-Blind Violin Test: Can You Pick The Strad? by Christopher Joyce (14)*
- *Million-dollar Strads fall to modern violins in blind 'sound check' by Adrian Cho (15)*
- *Science can tell us only so much about Stradivarius violins (16)* by Philip Ball

I am convinced that the personal experience of an esteemed violinist deserves to be noticed, as published in *The Strad* (17): "Christian Tetzlaff switched from playing older instruments to a modern one built by the German luthier Stefan-Peter Greiner. ... He suggests that "Stradivari and Guarneri 'del Gesù' were fantastic violin makers but their instruments are not good because they are old and Italian, but because they are well built - and this is something that somebody nowadays can also do."

It is evident that the Stradivari are not unsurpassed and modern luthiers can make modern violins with excellent sound. The problem is to overcome a cultural "must". It takes courage. A violinist knows that if he plays a Stradivarius at a concert he will have more publicity, more audience and more attention from critics and concert agencies. If the same violinist played another violin instead, he would have less publicity, less public and less attention, but perhaps the sound would be even better!

I humbly believe it is appropriate to point out a couple of articles made by us that further clarify our point of view:

- *Knowledge and Innovation on Classic Italian Lutherie: A Competitive ducation in Market Economy* by Massimo de Bonfils (18)

- *Beyond Stradivari: The New Santa Cecilia Violin - An Essay on Research of the Classic Italian Lutherie* by Massimo de Bonfils and Mauro Fabretti (19).

A better education for future luthiers

Stradivari violins are not untouchable and unreachable totems. Modern lutherie is able to make instruments with even better sound, but it is necessary to spread this culture and not take advantage directly or indirectly of low-cost low-quality factory production. I say this because a shameful scam has recently been discovered in Cremona:

- *Liuteria della Vergogna (Lutherie of shame)* by Fabrizio Loffi (20)
- *The scandal - Hundreds of Romanian and Bulgarian violins in white in the shops. They come from Kazanlak and Reghin, cost between 250 and 600 euros, are repainted and then put on the market. We need a real quality brand that is not just a designation of origin.*

A 250 euro factory violin sold for 8,000 with a coat of paint and a misleading label. A big gain. All violinists in the world would like a Stradivarius but the prices are exorbitant, so they come to Italy to buy a violin that is at least Italian, and they don't deserve to be scammed.

For *all the reasons we have listed so far*, the Santa Cecilia Conservatory in Rome has decided to find a Course for the luthier of the future, capable of offering a more modern and competent training, rich in tradition and interested in innovation. So, in our Conservatory we teach not only to play an instrument but also Lutherie, String Instruments' History and Technology. Our Lutherie Course, founded in 2011, is the only university-level course in Italy that has a laboratory and today has an average of 50 students from a dozen different countries. The professors are me (History and Technology Evolution of the String Instruments), M^o Mauro Fabretti (Laboratory Teacher, the real father of the Santa Cecilia violin) and M^o Massimo De Notti (the Laboratory's Assistant). Over the years we have also worked for a Course in Engineering in Musical Instruments in collaboration first with the La Sapienza University of Rome then with the Polytechnic Università delle Marche of Ancona. In 2016 we also organized the first edition of Santa Cecilia Violin Making International Competition where we received more than 100 instruments participants of 24 different nations. Two juries worked together, one of luthiers and the other of musicians, and the competition attracted the interest of various Italian and foreign press. In October 2019 we open our stand at the World Music China Expo, in Shanghai. Moreover, we also promoted several Seminars on Lutherie in several Italian Conservatories and Universities and abroad. Moreover, we promote the instruments built in our Laboratory by playing them in concert. For example, in 2017 we played in concert a classical violin built by our course at the Castello Sforzesco in Milan, at the Italian Embassy in Paris, France, during the European Music Fest, and finally at the Mirabell Schloss in Salzburg, Austria.

Our lessons cover both classical and experimental lutherie and in 2018/2019 a new ergonomic model of violin was designed and built, the new Santa Cecilia violin. Maestro Fabretti designed (see Fig.1) the new model project and our staff began to build it following the teacher's precious instructions. This new violin (see Fig. 2) is easier to play, powerful and with a better sound quality.

- easier to play: the ergonomic body helps the playing on higher positions pushing down his left shoulder.

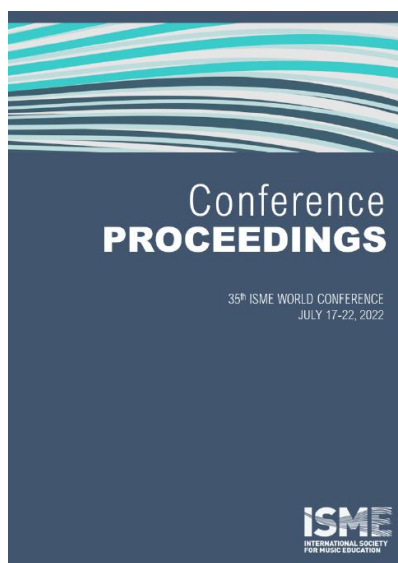


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(Abstract 66)

The beautiful sound, a visible voice

Massimo de Bonfils

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Abstract. The beautiful sound. How can we define beautiful something that cannot be seen? For centuries everyone has defined the sound of Stradivari as beautiful, but no one can see it. The problem is that there are now only 500 instruments of him left in the world, not all of them are in good condition and they will not be eternal; moreover, they are few and very expensive. So, we need new violins of that same acoustic standard at reasonable prices, but first of all we need to train and educate a generation of high-level luthiers, capable of not only equaling but also exceeding the production standards of Antonio Stradivari. Today this is possible, and we teach to do it; This is our educational purpose.

Keywords. Lutherie, Sound, Violin, Voice



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