KNOWLEDGE AND INNOVATION ON CLASSIC ITALIAN LUTHERIE: A COMPETITIVE EDUCATION IN MARKET ECONOMY

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Abstract

The Italian Violin Making reached its highest level of perfection in the days of Antonio Stradivari. Nowadays his stringed musical instruments have high prices and very few people can hope to buy one, but the contemporary Italian production is still the most appreciated by the market, a true economic success that endures along the centuries. Using modern technology it is now possible to fully understand and perhaps exceed the Stradivari's levels of perfection. The Santa Cecilia Conservatory of Music in Rome in 2011 founded a Lutherie course that is reaching these goals.

Key words: *Violin Making, Lutherie, Stradivari, Santa Cecilia*

1. A SUCCESS STORY

Even today many believe that the perfection of Stradivari's is a secret. Even today many argue that his art was due to the mysticism and occult. Really, has it now been unveiled the Stradivari Secret (well Secrets, since they are more than one)? Yes, and below I'll explain when, how and why. Let me clarify right away that I intend to demonstrate how the skill of Stradivari over time has been extensively studied, analyzed and understood in all its mechanisms by countless experts of great fame and recognized competence. These Secrets no longer exist as much, yet uninformed journalists and astute scientists will still fabled. I marvelled; can they still believe in unattainable secrets? Is it possible that despite today's scientific knowledge many believe to hidden secrets and cabalistic chemical formulas? Why are they financing both costly and interminable researches? Or are these just their reasoning? Certainly it’s sad that there is a need to resort to such cheap tricks to attract attention to a fascinating world that in itself deserves the spotlight of international culture: the Italian violin making.

1.1. Introduction

Imitate to perfection the work of Stradivari, being able to reproduce it faithfully, it has always been the dream of every luthier. Strange, actually to imitate a great of the past would have to be only the first step of any good artist / craftsman, while the second should be to be able to get over it. Instead Antonio Stradivari is still ~~is~~ presented as an unattainable perfection finished line, let alone seek to get over it!

Thinking to get over his level is absurd! We are now in the twenty-first century, and in the last century we landed on the moon, so it seems strange that with all the modern technology we failed even to match the artefacts of a carpenter from 3 centuries ago that he could not use electricity, had no books or photocopies of other people's models, had no modern machinery nor the technological capabilities of a modern chemistry lab or equipment for computed tomography (CT). It then takes the defence of our wounded psyches in pride: "If I cannot do it because he had a secret, maybe cabalistic, incomprehensible, dark, mysterious, inaccessible, unreadable, occult, magic! I CANNOT equal it, even if I want it!". And then here comes the fever of the Secret! And although it is well known that it is not anything like the recipe for *Nutella*, nor to the *Coca-Cola* ingredients, hordes of scientists - or assumed so - throw in a gold rush that would embarrass the Klondike in 1896. And indeed they were righteous: gold, depending on the calibre, today (February 2017) a rate of 37 euro per gram. The Stradivari instead are worth at least EUR 27,000 per gram! In fact weigh less than a pound and, if we consider that the *Messiah* Stradivarius was sold in 2014 to EUR 13.5 million.

But the real richness would be another: reveal one of the greatest secrets ever existed, then enter the History! We can no longer define the violin "only two planks of wood, a little paint and half a cup of glue". Economic and media interests are enormous. That's why in the XXI century we still wake up so

often by the "Eureka!" Cry of some of the many Stradivari treasure hunters. It has been so long since we have become accustomed to recurring "shouted" newspaper articles - not always dedicated to the great masses of information - about the re-re-re-discovery of the famous Antonio Secret: to turn Americans, British, Germans, French, Swedish - and lately also Australian - occasionally they assure us that the Stradivari technique was definitely discharged. In fact most of the time it was just the start of a new investigations, that never finished and often bounced with a curious late of even 2/3 years by social media. Readers have short memories and journalists should re-discover the same discovery a few years later: a reporter could also rip from a headline in 5th Editorial page!

1.2. Actual best scientific search

The current status of the best scientific research in this field is well represented by many very serious scientists working around the world:

- In the USA is doing a thorough job (started in 1963!) by *Saunders*, *Schelleng* and *Hutchins* who founded the CAS (*Catgut Acoustical Society*), dedicated to the science and art of making musical instruments. For about 40 years the members of the CAS were the main contributors to the Acoustic Violin Understanding publishing their studies on the CAS Journal. *Gabi Weinreich* then developed this further in his work. The CAS has now entered in the *Violin Society of America* and the Papers VSA (Violin Society of America) still publishes his studies twice a year.
- Lately (since 2000) Prof. *Joseph Nagyvary* of *Texas A & M University* has made a thorough study of the chemical composition of the varnish used by Stradivari (see Discover Magazine in July 2000, and Science Daily of 01.25.2009).
- An important research is being conducted in Sweden from *KTH* where a research team led by *Erik Jansson* and *Anders Askenfeldt* is working (at least 35 years!) on violin and bow.
- In Germany, *Heinrich Dünnwald* has recently completed an extensive statistical study for the frequency responses of a large number (over 700) of violins, from ancient to modern ones of Italian violins of great value factory. The parameters set by him were able to distinguish between the most modern and the old Italian violins based on data from the frequency responses.
- In Australia currently a group of researchers at *New South Wales University* in *Sydney* is studying the violin, guitar, flutes and brass instruments.

1.3. Studies and searches along the time

But all of today's very serious researchers are well aware that we are neither the first nor the only ones to investigate these topics. Of course we do not mean starting either from *Syntagma Musicum (1)* by *Michael Praetorius*, nor the voice Lutherie in the *Encyclopédie* (2) by *Diderot* and *D'Alembert*, but coming much closer to the present day and turning our attention only starting from half of the 800 we could find very interesting sources between the books of *George Dubourg* (3), *Charles Reade* (4), *George Hart (5)*, *Charles Goffrie* (6), *Friedrich Niederheitmann* (7), *George Gemünder* (8), *Antoine Vidal* (9), the foundation of the monthly magazine *Strad* (10), the books of *August Riechers* (11), *John Broadhouse* (12), *Théodore Dubois* (13), *Henry*, *Arthur* ed *Alfred Hill* (14), *Auguste Tolbecque* (15), *Walter H. Mayson* (16), *George Foucher* (17), *Horace Petherick* (18), *Domenico Angeloni* (19), and so on through countless works until the famous book 'The' Secrets 'of Stradivari' by Simone F. Sacconi (20) where, already in the preface, in order to clarify all too promising title, we read: "In the title of the book I used the word "Secrets" that usually associated with the singular name of Stradivari, is believed to give the measure of the greatness of the violin maker of Cremona. It is wanted, so, demythologize the refusal to reduce art to the material conception of a secret, implies that at the end and in any case a detection of the same, in this case of a recipe, on the kind of cooking or pharmacy, if it is around the paint above all that has been satisfied the popular imagination."

1.4. The secret survives?

Surprisingly, despite all this the desire to reveal alleged "Secrets" is not disappearing, and demonstrated by some recent articles:

- The Search Goes On for Stradivari's Secret (*21*)
- Stradivari's Secret (*22*)
- Investigating the secrets of the Stradivarius (*23*)
- "Alchemy" Was the Secret to Making Stradivarius Violins (*24*)
- Secrets of Stradivarius Explained (*25*)
- Secret Stradivarius found by Texas Chemist (*26*)
- Violin Stradivari's Secret? (*27*)
- The Secrets of The Stradivari String Instruments (*28*)
- Secrets of Stradivarius violins (*29*)
- Scientists reveal secret behind Stradivarius quality (*30*)
- Why there's nothing like a Stradivarius (*31*)
- The Secrets of Stradivari Solved? (*32*)
- The secret behind a Stradivarius - Imperfection (*33*)

1.5. The secret is dead.

So here we are to argue that for a long time on something known by all true experts in the field: the truth is that Stradivari's secret has not existed for a long time, and the fact that somebody continues to look for him it seems that is just a suspicious desire to waste time and drain resources. Indeed, perhaps this is the real reason for the continuous 'forced resurrection' of a Secret for the benefit of researchers engaged in such expensive studies as eternal.

Few, however, have reflected on the fact that despite remarkable acoustic capacity of Stradivarius instruments is at least in part also due to all those luthiers (lesser known of their famous predecessor) that along three centuries were forced to get their hands on those same instruments for maintenance, repair, restoration and also important changes, such as the inevitable replacement of the neck - resulting in modifying the angle of engagement - and shortening of 'diapason', increasing the pressure of the strings on the given plan by raising the bridge, the many replacements of the pegs, the repair of the oval holes of the same, the substitutions of the bass bars and the large number of worn bridges. If those Stradivari still sound - and good - will also be about them, right? To get an idea of the changes performed on instruments of the great violin makers of the past, you see the images that appeared in *The Telegraph* (33) "The secret behind a Stradivarius - Imperfection" where, however - how accurate are these journalists! - It comes to a job search performed on a *Guadagnini* violin by Dr. *Franco Zanini*, at the *Elettra Synchrotron Laboratory* in Trieste. Those images clearly show how, in the violins made before the end of the eighteenth century, due to elongation and a different structure of the handle has been necessary to move the height of the ‘f’ cuts because of the change of the tuning fork. Therefore, we must attach great acoustic qualities of the Guarneri violins, Stradivari and others also to the skill of the next luthiers who have managed to preserve them in spite of the important measures on the structure and therefore the functionality.

It is in this sense that contemporary Italian violin making intends to unveil a legendary mystery emptying it of every mystical aspect and revealing its simple mechanisms. They were not used secret or magic, but wisdom and precision of an exalted craftsman. The "Secret" has long been known, although too many people prefer to continue to fantasize of mysteries, becoming eternal finance for research in pursuit of what they already know and prefer to hide.

2. ITALIAN CONTEMPORARY LUTHERIE

Some know that even the *Guarneri* are antique Italian instruments from the gorgeous sound and are often preferred over *Stradivari* depending on the repertoire to be performed. But few know - or they want to accept the fact - that new tools can rival in beauty and power of sound with the best Stradivarius. This thing has been well documented and scientifically proven in more than one occasion. I will list below some of the scientific investigations carried out in this direction:

- Violinists cannot tell the difference between Stradivarius violins and new ones (*34*)
- Million-dollar Stradivarius loses out in the playoffs with modern violin (*35*)
- Stradivari loses out in blind-testing study of player preferences for old and new violins (*36*)
- Reflecting on measuring projection violin at the Paris-blind test (*37*)
- What's so special about a Stradivarius? (*38*)
- Are the "Great" Violins Really So Great? (39)
- A Strad? Violinists Cannot Tell! (*40*)
- Expert Violinists Bad at Picking Strads - Ten violin soloists who played different instruments blindfolded then picked a Stradivarius over a modern instrument as being the superior violin at rates no better than chance (*41*)
- Stradivarius Violins Are not Better Than New Ones (*42*)
- Blind-tested soloists Unable to tell Stradivarius violins from modern instruments (*43*)
- Comparing Strads and Moderns: the Paris Experiment (*44*).

It therefore seems clear that today we can build violins to rival in beauty and power of sound with the finest Stradivari and Guarneri, and this is also thanks to the fact that now the alleged "secrets" of the great Italian violin makers of the seventeenth and eighteenth century were now largely understood, although not always possible to completely emulate manual skills. And here's the big question: why do people believe that the level of Stradivari is unreachable when in fact it was already passed? The answer is that few violin makers really know how. We must therefore further spreading the adequate education in this field.

Italy in particular has a reputation as home of stringed instruments. Many people from abroad arrive in Italy, some to work as instrument makers and others to buy good violins but often all of them are disappointed. The truth is that most of the makers are not even able to approach the levels of the famous Stradivari.

2.1. The role of the Santa Cecilia Conservatory in Rome

This is the opportunity that the Santa Cecilia Conservatory of Rome has decided to choose: to educate new makers with the best possible education, using modern technology and scientific knowledge and allowing them to get to know how to apply the best construction techniques. The Conservatorio Santa Cecilia in Rome is interested in music from its origins in 1565, which were consolidated in the Bolla *Rationi congruit* of *Pope Sixtus V* (1585). Already in 1950 the interest in violin making at the Santa Cecilia Conservatory was likely to be able to conceive and implement, together with the homonymous National Academy of Rome and the ANLAI of Cremona, a contemporary violin making national competition that was held for several editions.

Coming to the last years, the Santa Cecilia Conservatory, after organizing various seminars on the subject of violin making, in the academic year 2011/2012 has started the Violin Making Course at the hands of current teachers, Maestro *Massimo de Bonfils* (History of Violin Making and Evolution of construction techniques) and Maestro *Mauro Fabretti* (Laboratory of construction, Maintenance and Restoration), where the teaching hours have a ratio of 10 to 1 between the practices and the theoretical lessons. The course is divided into historical and theoretical and laboratory lessons. Maestro *Fabretti* uses a laboratory of 80 square meters which also features a 20 square meter warehouse. In the years up

to now passed subscribers (on average 40 per year, with many foreigners) have already completed many violins, violas and cellos. Obviously the lessons concern not only about the construction but also the maintenance and restoration: there have already been recovered and restored several violins and basses. We can say that several students engaged in independent professional activities as a luthier, while others work in other people's violin-making workshops. In addition to now we have already been cracked and / or restored more than 100 arches. All made instruments become the property of the Conservatory, and are given in free loan to the students of the instrument courses. In addition, the course of restoration is recovering the usage of many instruments damaged in previous years. Maestro *de Bonfils* in his lectures is based on two books with illustrations: a text on LIUTERIA of 340 pages and the last book *Unveiling the Secret of Stradivarius!*, 56 pages describing all the latest scientific research and technologies used in faithfully reproducing instruments with the quality of the famous Stradivari master. These hand-outs are distributed free of charge to all subscribers. The lectures, based on the books, allow you to acquire the basic knowledge on the following topics:

- History of stringed instruments: the two origins, from the far east (*Ravanastron, Rebab, Rebec, Vielle, etc.*) and from northern Europe (*cruth*, etc.) with the evolution in *viole da braccio*. Various iconographic references found in frescoes and paintings from the late Middle Ages to the sixteenth century;
- Violin History: Baroque features in the initial version and subsequent metamorphosis in the classic version;
- Major violin making schools in Italy (Lombardy, Emilia-Romagna, Veneto, Liguria, Tuscany, Lazio and Campania) and Austria (Tyrolean school) with attention to the characteristics of the leading makers;
- How do you build a violin: a description of the entire craft of violin construction method, understood as a symbol of the entire production of violin making. Progressive photographic description of each step, from choosing and cutting the finished instrument timber, with various insights on specific topics (paint, soundpost, bassbar, etc.)
- Examination and observation in the classroom of the various components of a disassembled violin and unpainted in the construction phase
- Bow History: peculiarities of the initial version "curved" Baroque and subsequent metamorphosis until the classic version
- How do you build a bow: description of the proceedings of this traditional craft operation bow maintenance. progressive description of each step illustrated with photos, from choosing and cutting wood to the finished product, with various insights on specific topics (choice of horsehair, etc.)
- Description of the entire craft arc construction method with progressive description of each step; the process of bow horsehair change
- Video projection of movies about: Classical building of a wooden violin; construction of a carbon-fibre instrument; construction of an electric violin; latest scientific research in the field of violin making: *Texas A & M University* and *Catgut Acoustic Society* (USA), *New South Wales University* (Australia), *Federal Laboratory for Materials Science and Technology* of *St. Gallen* (Switzerland), *Nara Medical University* (Japan)
- Video projection of a *ppt* presentation regarding the relationship between the materials and the sound of stringed instruments (research by *Chladni, Nagyvary, Saunders, Schelleng, Hutchins, Gabi Weinreich, Jansson, Askenfeldt, Dünnwald,* etc.)
- Video projection of movies about: the sound difference in the acoustic output of the factory instruments (wood and carbon-fibre), modern and ancient violin making violin making of great authors.

2.2. Side events organized by the Violin Making Course at the Santa Cecilia Conservatory

- September 28, 2012 - Concert for World Music in 2012 at the Congress Centre, Hall Stradivari
- 2012, 2013 and 2014 - Advanced Training Course University in collaboration with the University *La Sapienza* and the National Academy of Santa Cecilia in Rome on the theme: Materials in Musical Instruments with a final concert on the occasion of the delivery of Diplomas
- Conference at the European Space of the European Community in Rome, Via IV Novembre (November 22, 2013)
- January 2014 - Three days of meetings on contemporary violin making, with final concert using the tools created by the students of Violin Making Course
- March 2014 - Open Days at the Santa Cecilia Conservatory Violin Making Course: Conference-Concert at the European Space of the European Community in Rome, Via IV Novembre
- (November 2014) Conference-Concert at the Academic Hall of the Conservatory Santa Cecilia
- (18 March 2015) Video on YouTube: http://youtu.be/Ap9BD7LASUo
- A.N.L.A.I. (Artistic Association of Italian Violin Making): sharing EVENTS IN MUSIC 2015 at the Exhibition of Paintings at the Municipality of Cremona (21 May 2015) Massimo de Luca Bonfils and Minervino (violin & guitar) "The Work of the Rossini Chamber Music" - the concert has been filmed by TV CREMONA 1
- Conference-Concert at the European Space of Representation in Italy of the European Union in Rome, Via IV Novembre (November 25, 2015)
- Concert "Il suono di Guglielmo": tribute to William dall'Ongaro at the Academic Hall (December 18, 2015)
- Online Magazine *Said in Italy*: Article on Violin Making Course (January 6, 2016) of University Specialization Course "Engineering in Musical Instruments" from the *University of Ancona* in collaboration with the *S. Cecilia Conservatory* of Rome, *G.B. Pergolesi* in Fermo and *G. Rossini* in Pesaro, at the Conservatorio G. Rossini, Salone dei Marmi - Press conference unveiling the new University Course of Improvement Panelists.
- Conservatory of Rome, Hall of Medallions, October 3rd, 2016: Press conference of the new edition of the INTERNATIONAL LUTHERIE COMPETITION S. CECILIA that after more than half a century will be held again in Rome in October 2016 on cooperation between the Academy and the 'Accademia Santa Cecilia in Rome, the ANLAI of Cremona and the National Museum of Musical Instruments in Rome
- *RAI 5*, during the TV broadcast "Piano pianissimo" on Sunday October 4th, 2016, special service to the Violin Making Course of the Conservatory S. Cecilia.
- *National Museum of Musical Instruments*, Sunday, 17.04.2016, Concert-Conference
- Interview for the Blog of the *Faculty of Architecture* of the University *La Sapienza*: https://annalisafaranolabivsaggio.wordpress.com/2016/05/06/intervista-al-maestro-massimo-de-bonfils/
- June 27, 2016 - Rome, S. Andrea delle Fratte: Lutherie Lesson for the University Specialization Course "*Engineering in Musical Instruments*" organized by the *Polytechnic University of Ancona* in collaboration with the *S. Cecilia* of Rome, *Giovan Battista Pergolesi* in Fermo and *Gioacchino Rossini* in Pesaro Italian Conservatories.
- October 9-22, 2016 - Rome, INTERNATIONAL VIOLIN MAKING COMPETITION SANTA CECILIA 2016 and International Prize *Città di Roma* - October 3-9, 2016

There was a great affirmation of the Chinese violin making at the international competition of Santa Cecilia in Rome; this is a contest that, after 50 years, returns to shine in the extraordinary setting of the Conservatory of Rome. The International Violin Making Competition was a prestigious appointment until the entire first half of the twentieth century but had abandoned Rome. Now is the Conservatory of Santa Cecilia and the Association A.N.L.A.I. they have preferred the return to Rome of this event and the first new edition of 2016 has confirmed the expectations. Mauro Fabretti, the most important coordinator of the Competition, said that Contestants from 24 countries of the world have presented 101 instruments and were evaluated by two international juries high profile: Master luthiers: *Florian Leonhard (England), Carlo Vettori (Florence), Luca Primon (Trento), Ikiko Suzuki (Japan)* and *Quan Zhen (China)*. Master musicians: *Felix Ayo, Massimo de Bonfils, Massimo Paris, Maurizio Massarelli* and *Massimo Giorgi*. Master *Yu Huidong*, winner of the recent Beijing international competition, won the gold medal (modern violins), but also the Cremonese violin making School can boast two gold medals (violas, cellos), both assigned to the Maestro *Marcello Villa*. The Swedish *Jens Johsnson* won the gold medal (antiqued violins) and another gold medal was also awarded to the Milanese *Roberto Muzio* (basses). Are also silver medals were won by the Russian Valery Prilipco (modern violins), the French *David Leonard Wiedmer* (antiqued violins) and South Korean *Lee Seung Jee* (violas) who also won two third prizes in the violas and violins in modern. Bulgarian *Milcev Pamen* and *Sergio Scaramelli* from Ferrara won the second prize (cellos and double bass). The Japanese *Toru Ohashi*, (antique violin) and *Gabriele Pralea* from Ferrara, (double bass) finally won the bronze medals. Special awards to *Ignazio Sanfilippo* (Milan), *Federico Fiora*, (Cremona), *Erew Plamen* (Bulgaria) and *Fabrizio Fratocchi* (Roma). The competition reserved for professionals has been joined by the "*Premio Città di Roma*" for young amateurs luthiers where they participated Chinese, Korean, Japanese and Bulgarian and some remarkable Italians: *Giuseppe Altavilla* (Ariano Irpino), *Franco Merlo* (Bovolone), *Giacomo Rocca* (Turin) and the young *Federico Castelluccio* (Palermo), which received the special Prize "*Guglielmo dell'Ongaro*" offered in his memory by the Superintendent of the National Academy St. Cecilia, *Michele dell'Ongaro*. The two teachers of the Violin Making Course in Santa Cecilia *Massimo de Bonfils* and *Mauro Fabretti*, have expressed great satisfaction: their course is held at the Santa Cecilia in Rome and is unique in Italy among all the Conservatories. Now, after only six years of life, the realization of this Intl. Competition sets a new record for the Roman Santa Cecilia Conservatory of Music. The conclusion of the awards ceremony was the concert performed with some of the best instruments in Competition played by *Massimo de Bonfils*, *Felix Ayo* and *Massimo Paris* accompanied by *Domenico Ascione* and *Rita Logiudice*.

- December 14, 2016 - Masterclass for 30 American graduates during their master's degree from *La Sapienza* University of Rome: "*Engineering for Lutherie*" with free book delivery in English, 100 pages.
- May 7, 2017 - Milan, Italy - Castello Sforzesco: Concert with a Violin built at the Santa Cecilia Conservatory School of Lutherie
- June 21, 2017 - European Music Fest - Paris, France - Italian Institute of Culture: Concert with a Violin built at the Santa Cecilia Conservatory School of Lutherie
- May 7, 2017 - Salzburg, Austria - Marmorsaal at the Mirabell Castle: Concert with a Violin built at the Santa Cecilia Conservatory School of Lutherie
- June 26, 2017 - Rome, S. Andrea delle Fratte: Lutherie Lesson for the Specialization Course "*Engineering in Musical Instruments*" organized by the *Polytechnic University of Ancona* in collaboration with the *St. Cecilia* of Rome, *Giovan Battista Pergolesi* in Fermo and *Gioacchino Rossini* in Pesaro Italian Conservatories.

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