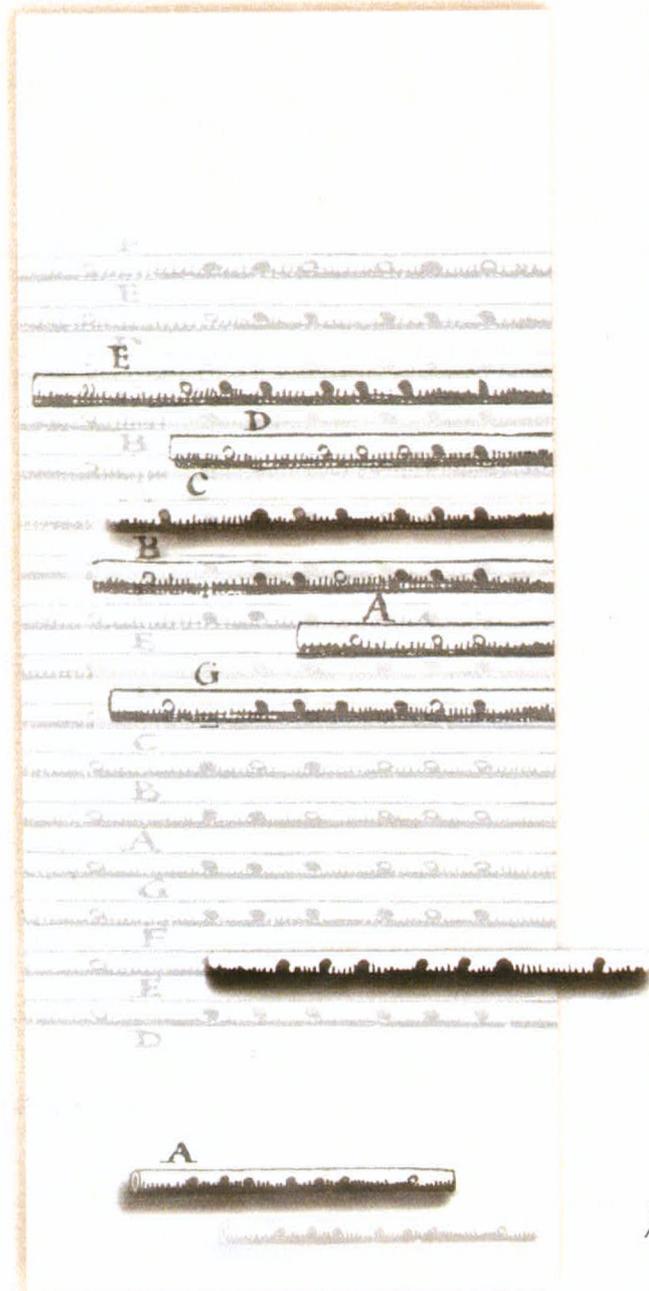


RECERCARE



XII 2000

Nicolò Paganini and gut strings: the history of a happy find

Thanks to a series of fortunate circumstances, aided by the tenacity of Dr Tatiana Berford, correspondent in Velikij Novgorod (Russia) of the Istituto di Studi Paganiniani in Genoa, and later of Dr Philippe Xavier Borer of Boudry (Switzerland) on a communication by Dr Maria Prestia Sanfilippo (former director of the Ufficio Promozione Città Turismo e Spettacolo), scholars have come to the knowledge of the existence in Genoa of some relics once belonging to Nicolò Paganini, which however had already been inventoried by the City administration. These finds consist of a violin bridge, two bows (one broken at various points), a small box of rosin made by Vuillaume, and a roll of gut strings in a reasonable state of preservation.¹

It is on this last item that our attention is focused. For it is the first, if not only, instance of gut string samples that can be dated with some certainty: in this case to the early decades of the nineteenth century. The material I inspected is preserved in an envelope that had already been opened by its discoverers. It bears the stationer's stamp of the "Cartoleria Rubartelli Genova", has a seal of red sealing wax showing the symbol of the City of Genoa and a manuscript inscription in black ink: "Corde e ponticello che trovansi sul violino di Paganini all'atto della consegna al municipio" (Strings and bridge found on Paganini's violin at the time of its delivery to the town hall). Inside was another envelope, made from a sheet of paper folded in two, bearing a second

¹ The material was found and is still preserved at the Archivio di Palazzo Rosso in Genoa. Attached to the broken bow is a piece of paper bearing the following note: "Arco di Nicolò Paganini, che adoperò durante tutta la sua carriera artistica. Rottosi l'arco a Newcastle (Inghilterra) in otto frantumi. Lo fece rimettere insieme dal celebre liutista [sic] Vuillaume di Parigi, ne cercò di valersi di quest'arco esclusivamente. In attestato di verità Achille Paganini figlio di Nicolò" (Bow of Nicolò Paganini, which he used throughout his artistic career. The bow broke into eight bits in Newcastle [sic], England. He had it put together by the famous lutenist [sic] Vuillaume of Paris, and tried to make exclusive use of this bow. In attestation of the truth, Achille Paganini, Nicolò's son). On the back of the cardboard rosin box the following is written: "Deux medailles d'or | Vuillaume, rue Croix 70, Paris." As for the strings, they are rolled up and bound tightly together by two small ribbons of red silk.

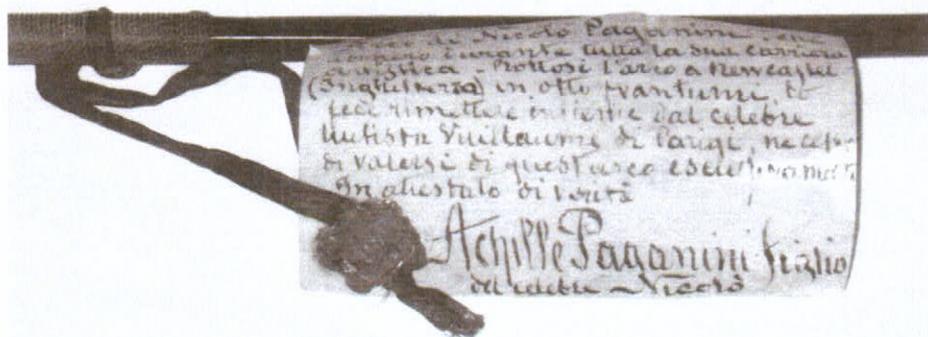


Figure 1. The card, attached to the violin bow belonging to Nicolò Paganini, bearing the attestation of authenticity of his son Achille (photo Daniela Gaidano).

ink inscription: “Antiche corde del violino di Nicolò Paganini” (Old strings of Nicolò Paganini’s violin).²

I measured the string gauges with a micrometer, and also calculated the degree of twist given to each sample during the manufacturing stage: a highly important parameter for assessing the acoustic yield of any gut string. It would also be very interesting to assess the number of guts used to make the various strings. But the “strands” could be separated with the required delicacy and counted only by specially hydrating some small fragments of the strings. Unfortunately this operation is not advised, because items of such antiquity could easily dissolve completely in the watery solution; in any case, the technique is in itself destructive.

As Edward Neill has pointed out, in some of his letters Paganini already provided interesting information about the strings he used: “Ho bisogno di un favore: ponetevi tutta la cura, e la diligenza. Mi mancano i cantini. Io li desidero sottilissimi [...]. Quantunque tanto sottili devono essere di 4 fila per resistere. Badate che la corda sia liscia, uguale, e ben tirata [...]. Vi supplico di sorvegliare i fabbricanti e di far presto e bene” (I need a favour: to be done with care and solicitude. I am without chanterelles [...]. Even if they are very thin they must be made of four strands to endure. Make sure the string is smooth, even and

² It is assumed that this donation accompanied that of the violin to the City of Genoa by Achille Paganini, Nicolò’s son, in July 1851: EDWARD NEILL: *Nicolò Paganini il cavaliere filarmonico*, De Ferrari, Genova 1990, p. 313.

Le Corde, e
l'ortocello che trovavano
sul Violino di Paganini
all'atto della consegna
al Municipio

Figure 2. The envelope in which were found both the bridge and the envelope containing the violin strings belonging to Nicolò Paganini (photo Daniela Gaidano).

well stretched [...]. I beg you to keep an eye on the makers and do this soon and well).³ And in a letter written from Naples to his friend and confidant Gerni, shortly before, on 29 May 1829, we read: “Il tuo Paganini desidera sapere [...] quanti mazzi di cantini e quanto di seconde, e a quante fila si desiderano da Napoli, perché ora si avvicina il mese di agosto, epoca giusta per fabbricar le corde” (Your friend Paganini wants to know [...] how many bundles of chantrelles and how many of second strings, and with how many strands, are wanted from Naples, because the month of August is approaching: the right time for making strings).⁴

Further information is provided by Carl Flesch: “Some thirty years ago the owner of the Schott firm showed the celebrated violinist Hugo Hermann one of Paganini’s letters, wherein the latter begged the head of the firm at the time to procure strings for him like the samples enclosed. Hermann obtained the loan of these strings. After measuring them on a string-gauge, he found to his astonishment that the D-string had the gauge of the A-string used today and the A-string the thickness of our E-string, and that the latter was not unlike a strong thread”.⁵

³ EDWARD NEILL: *Nicolò Paganini: Registro di lettere, 1829*, Graphos, Genova 1991, p. 80, letter from Breslau, 31 July 1829, addressed to “Sign^{re} Prof^{te} Onorio de Vito, Napoli”.

⁴ EDWARD NEILL: *Paganini: Epistolario*, Comune di Genova, Genova 1982, p. 49.

⁵ CARL FLESCH: *The art of violin playing*, 2 vols., Fischer, New York 1924–30 (original edition, *Die Kunst des Violinspiels*, 2 vols., Ries, Berlin 1924–8).



Figure 3. The envelope with the violin strings (photo Alberto Giordano).

In an earlier paper I suggested that these strings were in actual fact guitar strings, given that Paganini was also a brilliant guitarist.⁶ But this conjecture needs revising in the light of recent research I have done on the contemporary guitar. In brief, the study shows that the guitar made use of violin strings for the first three strings: in other words, it didn't use thin gauges at all, as is commonly believed today.

Flesch's information is in any case insufficient to offer any certainty on the matter. First, it is not clear whether the notes (D, A, etc.) associated with each

⁶ MIMMO PERUFFO: "Italian violin strings in the eighteenth and nineteenth centuries: typologies, manufacturing techniques and principles of stringing", *Recercare*, IX 1997, pp. 155-203; 176.

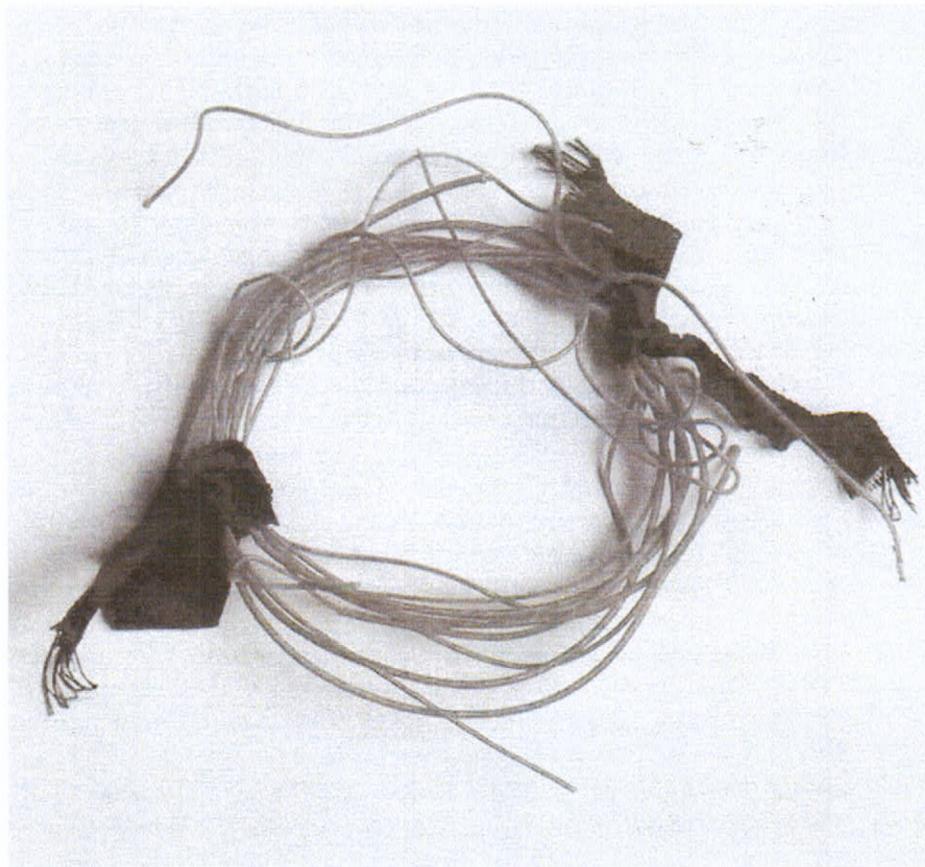


Figure 4. The strings removed from the envelope (photo Alberto Giordano).

sample were actually named by Paganini himself, or whether that was what Hermann imagined (in which case Paganini might have merely enclosed the string samples without specifying either their notes or the instrument they were needed for). Second, we must remember that Paganini also played the mandolin, so it is quite possible that the strings ordered were for this instrument.⁷ And finally, we cannot exclude the possibility that his request was merely a favour on behalf of some musical acquaintance.

In any case, if we disregard the thinnest string (for which we have no term of comparison) and compare Hermann's specifications with the table of tensions

⁷ NEILL: *Niccolò Paganini il cavaliere filarmonico*, p. 27.

given by George Hart towards the end of the nineteenth century, we may estimate the presumed D as ca. $0.84 \div 0.90$ mm and the presumed A as $0.65 \div 0.73$ mm: diameters that are decidedly thin for any violin of the time.⁸ About the presumed E, we frankly cannot say, since Hermann merely tells us that it “was not unlike a strong thread”. Was it perhaps a chanterelle for the mandolin? There is no way of telling.

The strings recently found can be assumed to be two Ds, three As and two Es: it seems likely that they are segments taken from longer lengths that were cut to size for the violin. They are straw-yellow in colour, fragile, slightly wrinkly and intact (i.e. never used). The E strings have a medium twist (ca. 45° angle), while the A and D strings have a decidedly high twist (close to 80°). We can well imagine, therefore, this guaranteed excellent acoustic results, in certain respects different from that of strings today, which are often much less twisted and hence stiffer.

Below are the diameter ranges found over all the samples:

| string | diameter (mm) | note |
|--------|--------------------|--------------|
| E | $0.70 \div 0.72$ | medium twist |
| A | $0.87 \div 0.89$ | high twist |
| A | $0.80 \div 0.83^*$ | high twist |
| D | $1.15 \div 1.16$ | high twist |

* This measurement was found on only one segment of string.

As we notice, there is no wound fourth string. This, however, is hardly surprising, because it was customary at the time for the fourth string to be made not by string makers but by instrument makers (if not by the musicians themselves), using a fairly thin second string as the core.⁹

What is altogether surprising, on the other hand, is how remarkably close the calibres of the above table are particularly to those of Andrea Ruffini, the famous Neapolitan string-maker of the late nineteenth-century (despite some uncertainty over the final diameter, owing to the fact that the strings were

⁸ GEORGE HART: *The violin: its famous makers and their imitators*, Dulau and Co., London 1875, section 3, p. 54.

⁹ NEILL: *Paganini: Epistolario*, p. 67, Milan 28 June 1823: “[...] colà mi restituirò a Milano per li tuoi violini, e ti farò fasciare delle quarte di filo d’argento” (I will return to Milan for your violins, and will have some fourth strings bound for you with silver thread). EDWARD HERON-ALLEN: *Violin-making as it was and is* [...], Ward, Lock & Co., London 1884, chapter XII “The strings”, p. 213: “I always obtain my covered strings [i.e. the fourth] for violin or viola from Mr. G. Hart, who covers them with alternate spirals of gun-metal and plated copper”. FRANCESCO GALEAZZI: *Elementi teorico-pratici di musica con un saggio sopra l’arte di suonare il violino*, Pilucchi Cracas, Roma 1791, p. 74: “Non sarà, cred’io, discaro al mio lettore, che io qui gli descriva una picciola semplicissima macchinetta, e l’uso glie ne additi per filarsi, e ricoprirsi d’argento da sé i cordoni” (It will not, I believe, be unwelcome to my reader if I describe, and explain the use of, a small and very simple machine for threading and covering the fourth string with silver wire).

smoothed exclusively by hand and the thickness of the original material was in any case variable, no matter how well selected the gut):¹⁰

E: ± 0.67 mm
 A: ± 0.90 mm
 D: ± 1.17 mm

And they also agree with the data given a hundred years earlier by Count Riccati:¹¹

E: ± 0.70 mm
 A: ± 0.90 mm
 D: ± 1.10 mm

However, this shouldn't come as a surprise if we remember that in Italy — from the seventeenth century, or even earlier¹² — the strings were produced preferably from whole guts of lamb (and not ram, which in Italy seems not to have been as “popular” as it was in France) of 8–9 months of age, according to a practice that was strictly standardised and handed down from father to son. As reported in both Italian and other sources, the making of a violin chanterelle generally required three “strands” (i.e. guts), but sometimes even four.¹³ We find this both in the eighteenth and late nineteenth centuries.¹⁴ The fact of using four strands doesn't necessarily imply that the chanterelles were particularly thick (if with three guts the diameter is ca. 0.70 mm, with four it would be ca. 0.82 mm), but merely that there were times when the gut available to the string maker was a little thinner than usual. This is also confirmed by a passage from one of Paganini's letters.¹⁵ And as a string-maker myself, I can affirm that, final diameters being equal, a string made of four thin guts is much more regular and durable and also truer than one made of three “standard” guts. Paganini evidently knew what he was doing when he ordered the strings: he specially asked for chanterelles of four strands (which would enhance the durability and limit the number of false strings) and he even went to the length of asking a trusted person to keep an eye on the Neapolitan string makers.

¹⁰ WILLIAM HUGGINS: “On the function of the sound-post and the proportional thickness of the strings on the violin”, *Royal Society proceedings*, xxxv 1883, pp. 241–8: 247.

¹¹ See PATRIZIO BARBIERI: “Giordano Riccati on the diameters of strings and pipes”, *The Galpin Society journal*, xxxviii 1985, pp. 20–34.

¹² Statute of the Roman string makers' guild: Roma, Biblioteca Angelica, Camerale II, Arti e Mestieri, Statuti, coll. 312, busta 12, anno 1642.

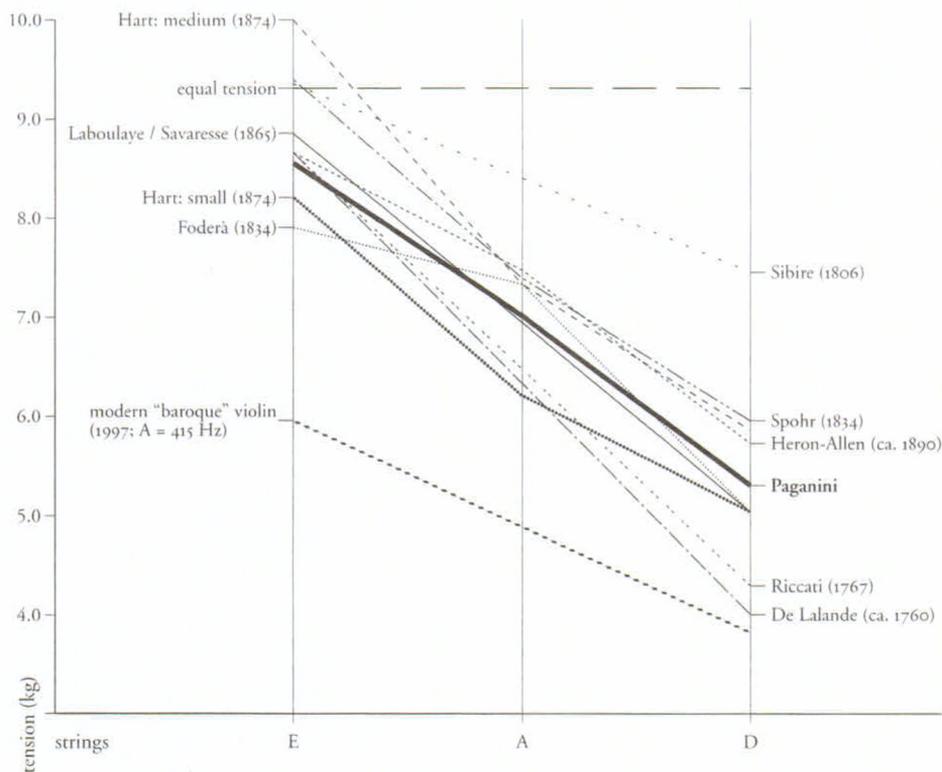
¹³ FRANCOIS DE LALANDE: *Voyage en Italie [...] fait dans les années 1765–1766*, 2nd edition, vol. IX, Desaint, Paris 1786, pp. 514–9.

¹⁴ HERON-ALLEN: *Violin-making*, chapter XII “The strings”, p. 212: “for the first, or E string, 3–4 fine threads”.

¹⁵ See above and footnote 3.

If we consider that the diameters measured agree almost entirely with those of numerous other contemporary sources, and if we also remember that manufacturing was considerably standardised, I think we can rule out the possibility that the individual items shrank as a consequence of further drying. Besides, a finished gut string is already in itself what one might call a "mummified" material.

The following graph superimposes onto graph 2 of my previous paper the scaling of tensions of the average diameters of the E, A and D strings under the same working conditions (vibrating length 33 cm; $a' = 435$ Hz).¹⁶



One observes that the string samples show a system of almost perfectly progressive working tensions. This is exactly as one would expect, and is indeed consistent with the surviving historical data, seeing that they are practically identical to the Ruffini "set" so highly prized in the late nineteenth century.

¹⁶ PERUFFO: "Italian violin strings in the eighteenth and nineteenth centuries", p. 187.

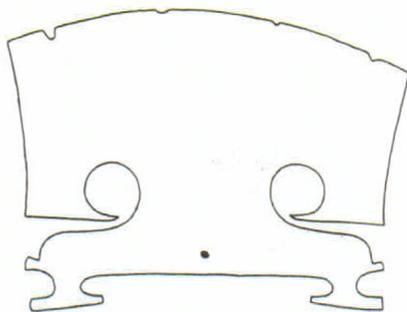


Figure 5. Nicolò Paganini's violin bridge (drawing by Mimmo Peruffo).

Conclusions

Regardless of whether or not the strings in question actually belonged to the great violinist, in all likelihood they are the only surviving exemplars that certainly date to the early nineteenth century. In agreement with the studies carried out on the subject, they once again refute the deeply-rooted opinion that the stringing of violins was then much lighter than it is today. In addition, the strings were subjected to a judicious degree of twisting. Though this was less pronounced on the chanterelles (which thus gained in resistance to tension and fraying), there was a high degree of twist on the second and, above all, third strings, which worked only at a fraction of their breaking load and needed as much elasticity as possible to yield the best acoustic results. These finds seem to document that Paganini *also* used strings with diameters customary for his day. Though we do not know for certain that they were made in Naples, they were undoubtedly made skilfully. There is some doubt, however, about the meaning of the request in his letter ("I want them to be very thin"), which seems to contradict the other statement that he wants the strings to be "of four strands to endure". Finally, we cannot exclude the possibility that, in the course of his career, even Paganini (like any other musician today, for that matter) indulged in a little experimentation with different calibres on the only material available, which he also considered as the best: Neapolitan gut.

Mimmo Peruffo is involved in the study and reconstruction of the gut strings used during the renaissance, baroque and classical periods. His contributions on the subject have appeared in the FOMRHI quarterly, Bollettino della Società del Liuto, The Lute Society of America quarterly, Quattrocentoquindici, Il Fronimo, and Recercare. He has drawn up the gut string sections in both the new catalogue of the musical instruments in the Germanisches National Museum of Nürnberg and that of the recent exhibition held in Bergamo on "Evaristo Baschenis e la natura morta in Europa". Finally, he has carried out the first careful examinations of the fragments of gut string dating to the first half of the eighteenth century in the Museo Stradivariano of Cremona.

SOMMARIO

Nicolò Paganini e le corde di budello: storia di un felice ritrovamento

È stata recentemente esaminata a Genova una serie di reperti risalenti a Nicolò Paganini: un ponticello da violino, due archi di cui uno rotto in più punti, una confezione di pece di manifattura Vuillaume e un rotolo di corde di budello in discreto stato di conservazione, tutti facenti parte, assieme al celebre violino «Il Cannone», del lascito di Achille Paganini al municipio nel 1851.

Questo ultimo reperto rappresenta il primo se non unico caso di campioni di corde di budello la cui datazione sia presumibilmente certa e risalente ai primi decenni del diciannovesimo secolo. Il materiale era conservato entro una busta con la dicitura manoscritta in inchiostro nero «Corde e ponticello che trovansi sul violino di Paganini all'atto della consegna al municipio». All'interno della busta si trova un involucro realizzato con un foglio piegato in due sul quale compare una seconda scritta manoscritta in inchiostro: «Antiche corde del violino di Nicolò Paganini».

I calibri delle corde sono stati misurati per mezzo di micrometro stimando contestualmente anche il grado di torsione impartito a ogni campione nella fase di manifattura. Le corde ritrovate possono presumibilmente essere considerate due re, tre la e due mi, si presentano colorate in giallo-paglia, fragili, leggermente rugose e integre, cioè mai utilizzate. I diametri medi riscontrati oscillano intorno a 0,70 mm per il mi, 0,87 mm per il la e 1,15 mm per il re. Le corde di mi sono realizzate in media torsione (circa 45° d'angolo) mentre quelle di la e re decisamente in alta torsione, ovvero con un angolo di fibra prossimo a 80°. Come si può notare manca la quarta corda filata: la cosa non stupisce perché, come di consueto per l'epoca, essa veniva realizzata non dai cordai quanto dai liutai (se non proprio dagli stessi musicisti) utilizzando una seconda un po' sottile come anima.

Risulta quantomai sorprendente la notevole aderenza ai calibri del celebre cordaio napoletano di fine Ottocento Andrea Ruffini. Le misure concordano anche con i dati forniti cento anni prima dal conte Riccati. La cosa non deve tuttavia meravigliare se si rammenta che in Italia fin da prima del Seicento le corde venivano prodotte partendo preferibilmente da budella intere di agnello di 8-9 mesi di età secondo una prassi rigorosamente standardizzata e tramandata di padre in figlio. Il fatto che i diametri rilevati concordino pressoché totalmente con le misure provenienti da numerose altre fonti del tempo — tenendo conto anche della grande standardizzazione produttiva — sembra far escludere che possa essere avvenuto un processo di essiccamento ulteriore tale da aver contratto significativamente ciascun reperto. Va ricordato comunque che una corda di budello finita è già di per sé un materiale 'mummificato'.

Indipendentemente dal fatto che le corde in esame siano appartenute o no al grande violinista esse sono con tutta probabilità gli unici esemplari risalenti per certo al primo Ottocento. Esse, confermando gli studi sinora apparsi, vanno ancora una volta a confutare l'opinione radicata che vuole che i violini del tempo utilizzassero montature assai leggere rispetto a quelle di oggi.

Mimmo Peruffo si occupa dello studio e della ricostruzione delle corde di budello in uso nel rinascimento, barocco e periodo classico. Suoi contributi su questo argomento sono apparsi su «FOMRHI quarterly», «Bollettino della Società Italiana del Liuto», «The Lute Society of America quarterly», «Quattrocentoquindici», «Il Fronimo» e «Recercare». Ha curato la sezione riguardante le corde di budello del nuovo catalogo degli strumenti musicali del Germanisches National Museum di Norimberga e del catalogo della recente mostra di Bergamo «Evaristo Baschenis e la natura morta in Europa». Ha eseguito infine per la prima volta accurati rilievi degli spezzoni di corde di budello risalenti alla prima metà del diciottesimo secolo conservati al Museo Stradivariano di Cremona.

P.S. At the moment of going to press, the sad news came to me of the death on 14 May 2001 of Edward Neill, a man we shall all remember for his boundless enthusiasm and profound knowledge of Paganini.