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### On the early violin bridge position.

The chief concern of this article is the position of the bridge on the instruments of the violin family. Bridge emplacement is often seen in the paintings; some surviving old instruments bear clear bridge stamps in both the wood and the varnish.<sup>1</sup>

The position of the bridge has been the cause of much study and speculation, the consensus of researchers seem to reach the conclusion that either a longer sounding length or length adjustment or, a certain quality of sound was being sought.<sup>2</sup>

The only contemporary position of the bridge that is universally acceptable is that exactly on the line between the *f*-hole notches, but historical evidence suggests that this feature had not been standardized. Two or more ways of bridge placement existed and permitting variation in sound colour and response.

It is evident from the templates for measuring the string length given in the Preluier's *The Modern Musick Master...*, 1730, and the English anonymous *The Compleat Tutor for the Violin...*, 1750 that most of the early writings show of no concern with the *f*-hole notches. They seem to have been a mere finishing touch up to the design of the *f*-holes. Both of these sources recommend moving the bridge 'a little forwarder or backwarder as occasion requires'<sup>3</sup> in order to achieve the length of the given template<sup>4</sup>. Giuseppe Tassarini in '*Gramatica di Musica*', 1741, says: '*Measure off the stops or fingering of the violin with forty eight Tones and twelve perfect fifth, the half tones are not marked seeing they are changed or made by a Sharp or Flat. N: B: Where the hand are put, marks the three principal Transpositions in Terza, Quarta, and Ottava*'. There is no template, but the spacing of the tones and positions is interesting and needs to be explained. The noticeably high position of *b*<sup>1</sup> and *c*<sup>2</sup> rises a question: what length of the neck was on Tassarini's violin and what position of the bridge drives to the prescribed distribution of the tones.

Talbot's treatise (ca.1695) is the earliest to mention *f*-hole notches. The fingering charts from the early sources prove to be neither uniform nor to provide a reason for the various bridge placements. This situation is clearly out-lined by the pictorial evidence as I will show later, but before it is necessary to introduce some more ideas.

The work which deserves a special attention is the Curt Sachs's 'The History of Musical Instruments', 1890. On the p.320 he wrote about the Viol: 'With the holes and the bridge correctly placed (as it is prescribed by Thomas Mace<sup>5</sup> - D.B.), the viol achieved a perfection of *appearance* that could even surpass the pattern of the violin'. It seems to figure as one of the first statements in the modern literature where the correct position of

<sup>1</sup> The list of these instruments follows below.

<sup>2</sup> See reference at the end of the article.

<sup>3</sup> Preluier.

<sup>4</sup> The lengths of the templates are 320mm and 316mm respectively which is rather short. Probably, the bridges meant to stand more or less high up, that is closer to the fingerboard or to the *f*-hole notches. The lengths of the templates are 320mm and 316mm respectively.

<sup>5</sup> Mace wrote ('The Musick Monument...', 1676, p.245): 'Let This Suffice, to put you in to a Compleat Order for Viols, (either way,) Only Note, That the Best Place for the Bridge, is to stand just in the 3 Quarter Dividing of the Open Cuts Below, though Most, most Erroniously suffer them much to stand too High, which is a Fault'.



the bridge is given an aesthetically important role for external view of an instrument (although there is no aesthetic statement in Mace).

The more recent publications<sup>6</sup> dedicated to the violin design highlights the fruitfulness of proportional, geometrical approach apparently used by certain instrument builders of the past. These studies are mostly based on the geometrical analysis of the surviving instruments<sup>7</sup>. According to these, the instrument was conceived in all its parts as a harmonious whole. Therefore the bridge must have had its proper place defined by the number, which conducted the entire design of the instrument to the Beauty. Various types of proportions once had been important for the Renaissance and Baroque artist and as applied to the lutherie, most comprehensively explained by K.Coates. Although the modern geometrical studies do not confabulate the further back bridge emplacement, and on its own do not prove to be convincing as regards to the peculiar bridge stand, turn out to be elucidating on these matters in conjunction with iconographical analysis.

The iconography is an important vehicle, revealing the question in all its complexity. It certainly can not be used as a source of information directly applicable for to design an instrument. Nevertheless, the 'pictures are our main guide'<sup>8</sup> to the aesthetics of the periods through which the violin have also passed. That the violin is a beautiful object in itself is beyond debates. This implies that the violin is an object of a visual art and, therefore, the esthetical rules developed during the Renaissance and early Baroque periods should be applicable in the appreciation of the violin design and its development. Available written sources on the visual arts help to better appreciate not only the paintings themselves and the instruments thereby shown, but also to perceive more adequately the idea which led the early artist, either one was painter or an instrument builder to create things in a certain way, that we call - style.

Beauty and Harmony are rational qualities for the Renaissance and Baroque artist. These qualities were explained in the terms of mathematics and geometry, essential parts of humanistic education. Thus, according to many<sup>9</sup>, the *formula of beauty*<sup>10</sup> lie in '...the form and correspondence of the whole, with respect to the several parts, of the parts with regard to each other, and of these again to the whole'<sup>11</sup>.

Indeed, analyzing the instruments found in the paintings of different periods with the *square and compasses* one finds oneself introduced to several curious circumstances. Here is the example of the iconographical database (see *fig. 1*<sup>12</sup>) which outlines the field of research, and gives a clear idea of what has been studied.

Conforming to the scale of the table, about 184 pictures of different times and origins, containing 200 instruments few fiddles and both violins and viols were measured. It is

<sup>6</sup> K.Coates, 'Geometry, Proportion and the Art of Lutherie', Oxford, 1985; Herbert Heide, 'Musik-instrumentenbau', Leipzig, 1982(7); Tullio Pigoli, 'La tracciatura degli strumenti ad arco', Listeria, 1981 no.3, 1985 no.13, 'Evoluzione delle curve di bombatura', 1984 no.10; Tiziano Zanisi, 'Disegno...' in 'Atti della giornata di studio di cultura liutaria', Cremona, 1987, etc.

Edward Cowell, 'Violin and Viola designs of the Old Italian Masters', Hannan ....., Essex, ca. 1950.

<sup>7</sup> The problem here is that we can not be sure whether these instruments preserved in original condition or not.

<sup>8</sup> P.Holman, 'Four and twenty Fiddlers...', 1995, p.3.

<sup>9</sup> Giovanni Paolo Lomazzo (nephew of Gaudenzio Ferrary), 'Trattato...', Milan, 1584; Paolo Pino, 'Dialogo di pittura', Venice, 1548; Leon-Battista Alberti, 'Of Architecture', ca.1435; Leonardo da Vinci, A.Durer, G.Vasari, etc.

<sup>10</sup> Shestakov, V.P., 'Renaissance Aesthetics', Moscow, 1981; p.539.

<sup>11</sup> Andrea Palladio, 'Four Books on Architecture', Venice, 1570.

<sup>12</sup> Refer to appendix for explanation of entries.



rather wide field of interest. The reason for such a comb out of the early pictures lie in the general statement that the early violin fittings and the low position of its bridge persisted into the 17<sup>th</sup> and 18<sup>th</sup> centuries from the 'similar usage much earlier in the 16<sup>th</sup> century' (D. Boyden, 'The History...' (1965). Somewhat broader views on that matter were expressed by Emmanuel Winternitz, in 'Musical Instruments and their Symbolism...' (1979); Sybil Marcuse, in 'A Survey...' (1975); 'The Scribner guide to the Orchestral Instruments' (1983); Francis W. Galpin, 'A textbook of European Musical Instruments...' (1937, 1944). According to these, the violin design was not an absolute novelty but the combination of many successful features of the earlier musical instruments. Indeed, the pictorial evidence and extant instruments support this idea<sup>13</sup> and enable to undertake the research starting from the late 15<sup>th</sup> - early 16<sup>th</sup> centuries, checking proportions of the fiddles, viols<sup>14</sup> and hybrid instruments, and studying how their proportions influenced violins.

The result of this iconographical research is surprising: only 19 violins represent their bridges in the line with the *ff* strokes (few of them even higher). 6 other instruments resemble the same proportion. 64 violins got the bridges below the *f*-hole notches. 41 instruments of all families have the bridges in  $\pm 1,6$  division of the body length. 25 instruments -  $\pm 1,7$ . 21 instruments have the bridges even lower than the above listed - 1,4 - 1,5 division of the body length, these proportions are more characteristic of the earlier - end of the 15<sup>th</sup> and whole 16<sup>th</sup> centuries instruments. 32 violins have the bridges lower than the *f*-hole strokes, but for various reasons can not be studied with measuring tools. 8 instruments show the bridge higher than all of the over described - that is in the middle of the bellies. 1 instrument (fiddle) has the bridge in the lower one sixth of the body length. 43 instruments depicted facing backs and therefore impossible to know about their bridges.

Bearing all this in mind, I suggest that the bridge position could be determined by a luthier on the very initial stage when designing an instrument on the paper. It appears logical to conclude that there were several ways of embodying that job. That is: expressing personal attitude, following recommendations of the musicians, both spoken and printed, such as those treatises mentioned at the beginning of the article. Certainly there were craftsmen who, being unaware of any rules of any arts, created instruments that have, in the words of Coates, *dessin native*<sup>15</sup>. The last but not least, musicians themselves were active enough to introduce here and there re-designing of the instruments. Visual aesthetics could well be considered among the other reasons, such as manageability of the instrument, its sound, durability of the upper strings.

If position of the bridge is to be defined by the number or numbers which conduct the entire design of the instrument's body, we arrive to a few variations in positioning the bridge. These are: the placement of the bridge with the line of the *ff*; the placement of the bridge in accordance with the ratio  $\pm 1,7$ , or the SQRT3 (see Coates, and the summary of

<sup>13</sup> This is one of the basic approaches in the renaissance aesthetics. Combining the most perfect features of different phenomena in one in order to avoid imperfection is suggested by many writers. (See: Albrecht Durer, 'A book on painting', Paolo Pino, 'Dialogo di Pittura', 1548, in the 'Renaissance Aesthetics', Shestakov, V.P., Moscow, 1981.

<sup>14</sup> See record No. 34 in the table on the fig. 1. Note the perfectionism of the painter in the way he designs the proportions of the instrument. Indeed, this is the most mathematically accurate design of an instrument in my picture collection.

<sup>15</sup> See Coates, 'Geometry, proportion and the art of lutherie', Oxford, 1991.



my iconographic study); the placement of the bridge in accordance with the ratio of  $\pm 1.6$ , or the Golden Section; and various but not numerous ways of the placement of the bridge still further back to the tail-piece, which is often seen in the pictures of the 15<sup>th</sup> century.

The bridge standing further back drives to the introduction of a greater string tension, which confirms the conclusions made in the most recent research in that field (Segerman, Peruffo). It facilitates sound projection of the bass strings, and playing the smaller instruments - violin and viola - holding them below the collar bone as it eliminates tension in the left hand for the fingers fall naturally higher in that playing position. Distribution of the tones on the fingerboard resembles that of Tassarini. The instrument's sound becomes louder. It must be an essential feature for the instrument, the earliest use of which were



*Fig. 2*

out-door events and doubling choirs in a churches. The further research involves thicknesses of the instrument's plates, bass-bar, string diameters and tensions, and early woodworking aesthetics. The equal thickness of the plates in the instruments of the great Italians, as stated by the Hills, seem to be the most appropriate in conjunction with the equal string tensions (Segerman, Peruffo). The position of the soundpost in conjunction with the lower bridge position remains unclear for I have no evidence.

A curious fact appear when analyzing the pictures. There are more variations as regards the bridge emplacement in the paintings of the north Europe, comparing to that of the south. These areas are mostly: northern Europe, i.e. England, the northern Netherlands, and northern Germany. In the pictures of these countries, more instruments have bridges standing higher, i.e. closer to the modern position. Pictures of the southern



areas are more regular in that sense, though a few instruments furnished with higher bridges.

Segerman in his e-mail regarding the Comm., pointed out that the pitch standard must have been one of the important factors affecting the bridge placement. Indeed, there is a 'strong correlation between where the bridge was placed and the geographical region where the picture was created. A high pitch standard close to modern was mostly followed for violins in England, Scandinavia and Protestant (northern) Germany. A pitch standard a tone lower was mostly followed in Catholic (southern) Germanic-speaking areas, France, and the rest of southern Europe. In regions of high pitch standard, except for instruments smaller than usual (like Praetorius's violin), the bridge could not be placed much lower than the modern position without frequent breaking of the *e* string becoming a serious problem. In regions of low pitch standard there was a choice, with a lower bridge position giving more projection, and a higher bridge position being more relaxed, with longer-lasting *e* strings' (Segerman).

The other reason that might have been a strong factor was the music and the technical skill of the players. The northern music in the 17, beginning of the 18 centuries is often more virtuosic than that of south (with a few exceptions). Playing in high positions, shifting, difficult passages etc. become more difficult if the bridge is placed too far further back. The more advanced technically music, the higher playing positions were introduced, the higher standing bridge, etc. up to adoption of 'chin-on' playing technique and various devices as chin- and shoulder-rests.

Proportions of a number of surviving old instruments which have distinct marks in the varnish definitely caused by the bridge are not studied. Therefore it may be useful to list them here, in chronological order.

#### Museo dell Castello, Milano

1. Violin, cat.no.49, attrib. to Michel Angeli, Brescia, 16<sup>th</sup> c. The bridge of this violin is placed on the line between the *f*-hole notches, but the *f*-holes themselves are cut out considerably lower than usual.
2. Violin, cat.no.?, attrib. to Zuan Maria da Brescia, Venice, 16<sup>th</sup>. There is a visible damage in the varnish around 12mm lower the *f*-hole nicks and clearly caused by the bridge.
3. Alto, cat.no.?, attrib. to Jacob Stainer, Absom, 1659. The varnish is marked by the former bridge placed about 10mm lower than its present stand.
4. Violoncello, cat.no.139, attrib. to Mathias Albani, 1703. The varnish is worn out a little lower than the *f*-hole nicks.
5. Violoncello, cat.no.52, attrib. to Pietro Ranta, Brescia, 1729. The varnish of the instrument is damaged by the bridge approximately 30mm lower than the line between the *f*-hole nicks.
6. Violin, cat.no.99, attributed to Gennaro Gagliano, Napoli, 1763. Description: the varnish is extensively worn out around the bridge both higher and lower the *f*-hole nicks.
7. Violin, cat.no.105, attrib. to Pressenda, Torino, 1834. The varnish bears damage from the bridge approximately 12mm lower the *f*-hole nicks.
8. Alto, cat.no.104, attrib. to Raffaele Gagliano, Naples, 1<sup>st</sup> half of the 19<sup>th</sup> century (!). The varnish bears clear damage caused by the bridge around 20mm further down to the tailpiece.

#### The Freiburg Cathedral



The five Freiburg Cathedral's instruments (from ca. 1589-90) have the bridges in the line with the *f*-hole notches, but the *ff* are placed much lower than is 'normal'. This feature is analogous to the violin no. 49 in the collection of Museo dell Castello.

Musikinstrumenten Museum in Brussels.

14. Violin, cat. no. 2792, attrib. to Mathias Holmans, 1665

15. Alto, cat. no. 2794, attrib. to C. Borbon, 1692

Galleria Estense di Modena.

16. Violoncello, cat. no. 2022, labeled: Dominicus Gallus Parmensis Fecit Parmae Anno Saluris 1691. 17. Violin, anon. Netherlands, end(?) of 18<sup>th</sup> c.

17. Violin, cat. no. 2023, attributed to Domenico Galli, 1687.

Really remarkable specimens are the violin (1687) and violoncello (1691) attributed to Domenico Galli, Parma, and exposed at the State Museum of Modena (See *fig. 2*). Note the *only* clear from drawing place left by the maker is suited just below the *f*-hole strokes. The clear space was undoubtedly reserved for the bridge, but regardless with the will of the creator, modern repairmen placed the bridge *exactly on the drawing*, leaving the place destined for it empty and causing harm to the drawing. This emplacement of the bridge conforms to the recommendation of Thomas Mace (1676) given for a viol's bridge: "Let This Suffice, to put you in to a Compleat Order for Viols, (either way,) Only Note, That the Best Place for the Bridge, is to stand just in the 3 Quarter Dividing of the Open Cuts Below; though Most, most Erroniously suffer them much to stand too High, which is a Fault'.

**Summary of evidence on  
Low bridge position.**

Violin tutors, proving existence of certain freedom in bridge positioning. Show off no concern with the *f*-hole notches, but provide no explanation for the given string stops:

**1. Prolleur's *The Modern Musick Master...*, 1730**

**2. English anonymous *The Compleat Tutor for the Violin...*, 1750**

The tutor which does not provide a template for measuring the string-stop, but shows up a specific for long stop string distribution of the steps on the fingerboard:

**3. Giuseppe Tesarini, '*Gramatica di Musica*', 1741**

Evidence of existence of precise criteria for positioning the bridge, and existence of an alternative ways is found in:

**4. Th. Mace, '*The Musick Monument...*', 1676.**

**5. Iconography:** majority of violins are furnished with the lower standing bridges.

**6. Surviving instruments.**

I would be grateful for comments, criticism, and evidence.

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#### Appendix.

##### Description of entries into the Instrument Treasurer - database.

1. First entry is an autonumber. A number of a record in the database. Facilitates search and retrieval of the needed records. A number of the records is a total number of instruments found in the studied pictorial sources.
2. Second entry is a description of a specific technic in which the source is accomplished, that is - painting, drawing (ink, chalk, pensil or whatsoever), fresco, &c.
3. Third entry is an adopted title of the work, or one of the widely recognized.
4. Fourth entry - author's name, if not anonymous.
5. Fifth entry - life-time, as established by recent study. The values like 0000 mean that one of the dates is not known. Record is missing when both dates are not known.
6. Sixth entry is used when the life-time of an artist is not known.
7. Seventh entry is a description of the present location of the source.
8. Eighth entry defines origin of the source, not the origin of an artist.
9. Nineth entry describes the musical instruments found in the source. Each sell of that column has its entry, since all of the bowed instruments seen in a source are mentioned here, including those that are too obscure or show only a small part, and therefore



appear impossible to measure their proportions. I adopted certain abbreviations for the names of the instruments in order to facilitate use of the software. These names are: fid - for fiddles, vdg(a,t,b,d - alto, tenor, basse and discant respectively) for viola da gamba; vln, vla, vc, bass, basset - instruments of the violin family; a question mark - ? - preceding an entry mean that there is a difficulty of determining the size of an instrument, or its family - ?fid vla

10. Following eight entries describe the relative proportions of the instruments. Always bigger part is divided by smaller one:
  - (10.)Br PN - numerical expression of the relative position of the bridge - the ratio between the upper and the lower portion of the body.
  - 11 Br P - literal expression of the bridge position. 'L' - for the bridge standing further back towards the tailpiece, but within the *f*-hole length, "LL" - for the bridge standing beyond the *f*-hole length, 'B' - for the bridge standing between the F-hole notches, 'H' - for the bridge standing higher than the visible *f*-hole notches or the actual middle of the *f*-holes regardless with perspective distortion. For viol bridges 'L' means that the bridge stands as it is prescribed by Mace, 'LL' - if further back, 'H' or 'B' - if the bridge stands higher up. When the values of one of these eight fields are missing it means that for certain reason it was not possible to have reliable data.
  12. Tlp L - the relative length of the tailpiece - the ratio between the entire length of the tailpiece and the length of the string between the tailpiece and the bridge.
  13. Fngb L - the relative length of the fingerboard - the ratio between the length of the string and the length of the fingerboard, where the length of the string is divided by that of the fingerboard.
  - 14 Neck length - the relative length of the neck - the ratio between the body stop and the neck, or between the string length from the top of the body to the bridge and the neck, where the greater value is divided by the smaller, that is , by the value of the neck.
  15. S to B - the ratio between the length of the string and the length of the body, where the value of the former is divided by the value of the last.
  16. Br H - relative height of the bridge - the ratio between the bridge and the rib height, where the value of the bridge is divided by that of the rib.
  - 17 B to O - the ratio between the length of the body and the overall length of the instrument, where the last is divided by the former.
18. Eighteenth entry describes degree of the refinement of the art in accordance to Vasari's system: Sketches - '... a rough draft of the whole. Out of the artist's impetuous mood they are hastily thrown off. ' If Sketch is the first step, the following is Drawing. It is 'executed in a more finished manner, in the doing of which the artist tries with all possible diligence to copy from life...' (Louisa S. Maclehorse, 'Vasari on technique'). The last degree of refinement corresponds to '*design*'.
19. Nineteenth entry lists the most clearly depicted parts of the instrument.
20. Twentieth entry lists missing or unclear features of the instrument.
21. Twentyfirst entry determines intensity of the colour relatively to the colour of the flesh or other light coloured subjects. Thus the colour is defined as light when it is as light or but little darker than the flesh colour or any other light coloured objects such as paper, certain fruits, light coloured wooden objects such as lutes, &c.; the colour is



defined as dark when it is darker than the colour of the listed examples and when the instrument is depicted shadowed. In most of the cases the field does not have a value when monochrome pictures are being described, that is, drawings, etchings, monochrome sketches. Poor quality reproductions not considered.

22. The number of the visible frets.
23. The number of the visible strings.
24. The following four entries are dedicated to the bows:  
(24.)BC - description of the bow curvature: p - pronounced curve; s - straight bow; complex - combination of the both of the features; ? - unclear or invisible curvature.
25. Relative length of the bow - ratio between the length of the bow and the length of the instruments body.
26. Presence of the a screw.
27. Colour of the hair. Monochrom pictures mostly not considered.
28. Playing position of the instrument. If the value is missing, the depicted instrument is not played. Bc - the instrument is held below the collar bone; ac - the instrument is held above the collar bone; cn - chin on technique; of - the instrument is held on the floor; bk - the instrument is held between the player's knees; lute-like - the instrument is held lute-like when played.
29. Date of the execution as established by the recent research. (Missing value means that the date was not known to me on the moment of creating the record).
30. Century of the execution - an approximate date. Efficient tool for retrieving needed records for when the previous entry is missing.



ID	Type of picture	Title	Author or Source	Lifetime	Active	Museum or other location	Origin	Instrument(s)	Br PN
88	Engraving	"The moderna musick master", frontispiece	Smith Jakob (?)			Collection Dmitry Markevitch	England	?vc vdg	
232	Engraving	"The moderna musick master", frontispiece	Smith Jakob (?)			Collection Dmitry Markevitch	England	via	
113	Painting	"Concert"	Terbrugge Hendrick	(1587-1629)	?		Netherlands	vin	
135	Painting	"Zigeuner und Trinkendes Mädchen"	Terbrugge Hendrick	(1587-1629)		Kaiser Wilhelm Museum, Krefeld	Netherlands	vin	
72	Painting	"Violinist"	Terbrugge Hendrik	(1587-1629)		Sold London Sotheby	Netherlands	vin	1. 8
137		"Johann staden am Spinet"	Vaickenborch Frederick van	(1570-1623)		Germanisches Nationalmuseum, Nürnberg	Germany	vin	1. 6
151	Painting	"Regia Pietas"	Valet Nicholas				England	vdgb	. 2
152	Painting	"Regia Pietas"	Valet Nicholas				England	via	
ID	Type of picture	Title	Author or Source	Lifetime	Active	Museum or other location	Origin	Instrument(s)	Br PN
34	Painting	"St Cecile"	Zampieri Domenico	(1581-1641)		Musee du Louvre	Italy	via bat	1.645
76	Painting	"St.Cecile"	Zampieri Domenico (after Real Galdo)	(1581-1641)		Walker Art Gallery Liverpool	Italy	via	
52	Painting	"George, 3rd Earl Cowper, with his wife and the family of the Charles Gore"	Zoffany Johann	(1733-1810)		Paul Mellon Collection	England	vc	



Br P	Tip L	Fagb L	Neck L	S to B	Br H	B to O	Refinement	Details	Missing	Clr	FR	STR	BC	Bow L	Screw	H	PP	Date	Century
LL	. 1.2			. 1.1		. 1.6	sketch	bridge lower; 5 or more pegs	pegs	L		4p		1.0?	B	bk	1730	18	
						. 1.6	sketch			D		4p		?	B	ac	1730	18	
							design	only partly visible instrument	great part of the instrument	L		4p		?	W	bc	1626	17	
						. 1.79	sketch	neck, scroll	face-side	L	0	4?		?	B	bc	1614	17	
B							sketch	purfling; no f-holes!	peg-box	L		5p			B	ac		17	
LL	. 1.7						sketch	bridge design	fngb, nut position	L	0	4p		no	B	ac	1619	17	
H	. 1.3					. 1.6		prfl,	neck-pb joint	L	0	6a		0.8?		bk	1620	17	
			. 1.54			. 1.9			face side	L	0	4a		?	B	bc	1620	17	
Br P	Tip L	Fagb L	Neck L	S to B	Br H	B to O	Refinement	Details	Missing	Clr	FR	STR	BC	Bow L	Screw	H	PP	Date	Century
L	. 1.648	1. 646	1. 744	. 1.06		. 1.731	design	rose; strings; soundholes; tailpiece etc.	right f-hole	D	8	7?		no		of	1620	17	
											0	0							
B	. 1.6	. 1.3	. 1.66	. 1		. 1.7	design	scroll, right f-hole, C & G; metal wound strings		D	0	4a		0.6	yes	W	bk	1775	18



### Historical varnishes and colour of the bowed instruments in paintings.

Esthetical delight in instrument making is a subject of a great concern. External appearance of an instrument is one of the hot topics of many discussions.

Indeed, out-look of an instrument is a combination of many different features accomplished on different stages of the work. These include drawing, or design, woodworking and finishing techniques. Hereby I will point out a few important details concerning the latter.

There is quite a number of historical varnish recipes at our disposal. These are scattered in various old and recent studies in the history of varnishes, sources on painting, furniture, general works, &c. Few reprints can easily be accessed. Analyze and comparison of the *written* and *iconographical* sources discovers an important feature common for both.

The vast majority of the varnish recipes are instructions for making colourless varnishes<sup>1</sup>. Similarly, the vast majority of bowed instruments in my picture collection (containing 200 instruments) have a light colour. 110 instruments, while only 26 of them are dark. (The colour intensity of the remaining 64 was impossible to correctly evaluate for different reasons: monochrome pictures and poor quality reproductions were not considered). It appears obvious that in most of the cases, the early instruments were covered with light-coloured varnishes.

Today's practice is somewhat different. The old instruments naturally darkened. The new instruments are mostly dark, because they are copies of the old examples in *their modern state*. It is evident that the fashion has changed since the time passed by, and the light coloured instruments gave the way to the dark ones.

Obviously, the source of inspiration and values of nowadays differ from that of the earlier times. Alberto Bachmann<sup>ii</sup> wrote: 'The surest way of tracing a fine violin model is to obtain an original or "creator's" violin'. At the best circumstances, modern instrument builders do so. However, there is no secret that practice of tracing photographs of instruments is more common.

In one way or another, majority of today's instrument makers copy their instruments from the old examples, whereas renaissance or early Baroque makers might have had drew their ideals from the outer world and a human figure, possibly, including its colour. It is one of the basics of the Renaissance, the basis of the esthetical ideals of many architects, sculptors and painters<sup>iii</sup>. It seems to be obvious that these ideals have had its influence on a number of instrument-builders. Sufficient to notice that there must have been a frequent communication between the painters and the instrument makers: the painters were often musicians. Thus, Jacopo Tintoretto played many different instruments, including viol. Jacopo Bassano, Paolo Veronese and Tizian played viols. Guido Trasuntino even made a harpsichord for Tizian in exchange for painting.

Renaissance admiration at Nature can be seen in 'Scintille di Musica, 1533, of Giovanni Lafranco, where he praises at the lutes and viols<sup>1</sup> of the Brescians Zanetto Molichiaro and Giovanni della Corna, whose instruments said were '*almost too beautiful to have been made by human hands. They seem to have been made by Nature herself, without stain or blemish*'<sup>iv</sup>.

<sup>1</sup> This is a mistake in the Riley's book. G.Lafranco does mention either lutes or viols in the Ms., but organs.



Existing Renaissance and Baroque esthetical treatises concerned with visual arts must to be considered when studying appearance of the instruments in the pictures. This will ensure that the pictures and the instruments thereby shown are not taken at 'face value, without sufficient regard for successive styles'<sup>v</sup>. It is possible, but not necessary so, that the colour of the instruments have been altered according to the personal preference of an artist, or the influence of a certain school. *'The colours should be employed with so much harmony that a dark and a light are not left unpleasantly contrasted in light and shade...'*<sup>vi</sup> Giorgio Vasari in the 'Lives...'<sup>vii</sup>, 1550, says: *'...especially let there be great care always in putting the most attractive, the most charming, and the most beautiful colours on the principal figures...'* It is often the principal figures, who hold the instruments. We may conclude that the light tints given to their instruments were considered to be the 'most beautiful'.

The intensity of colour-varnish used for finishing the instruments has been various then and now. Both dark and light tints were applied. Historical evidence suggests that for one or another reason there was a strong preference to the light coloured appearance of the instruments.

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<sup>v</sup> However these varnishes have a light color of the components such as oil and resins.

<sup>vi</sup> Bachmann, A., *'An Encyclopedia of the Violin'*, Capo Press, N.Y., 1966; p.66.

<sup>vii</sup> See: Vincenzo Danti, *'Primo libro sulle perfette proporzioni da imitarsi da nel disegno'*, 1567; Baldassare Castiglione, *'Il Libro del Cortegiano...'*, 1528; Agnolo Firenzuola, Albrecht Dürer Benedetto Varchi, Tomaso Campanella, Francesco Petrarca, Giorgio Vasari; Giopolo Lomazzo, etc. in: V.P.Shestakov, *'Estetika Renessansa'*, Moskva, 1981. See also: *'Brussels Ms. Recueil des essais des merveilles de la peinture'*, 1635, Pierre Lebrun, in: Marry P.Marryfield, *'Original treatises...'*, London, 1849.

<sup>viii</sup> *'The teaching of bowed instruments from 1511 to 1756'*, Maurice Winton Riley, 1954, facsimile University Microfilms, Ann Arbor, Michigan, 1978.

<sup>ix</sup> E. Winteritz, *'Visual Arts'*, p.31, EWA, 1965

<sup>x</sup> Louisa S. Maclehorse, *'Vasari on technique'*, edited by G.Baldwin Brown, Dover, 1960.

<sup>xi</sup> Idem.



44 Historical Varnishes and Polishes<sup>1</sup>.

## MANUSCRIPTS

1. Jehan Le Begue Ms. 1431.

1. Recipe no. 117: "Azzurum sic fit".

Contains a recipe for varnish: '...put the mastic and varnish (sandarac) in powder into the oil ('olei communis')<sup>2</sup> and stir it well with a stick, and when you see that they are dissolved, add the Greek pitch in powder, and let it boil a little, until the whole is incorporated. ... Let it stand for three days.'

2. Eraclus Ms. dated 15c.

2. How to varnish gold so that it will not lose its colour. - If you wish to varnish gold that has been laid upon gypsum, varnish over the gold, not with pure varnish, but with that colour which is made for preparing auripetrum, mixed, however, with oil, and a little varnish, lest it should be too thick. ... But you may varnish figures and other colours with pure varnish or with thick oil.'

3. How wood is to be prepared before painting on it. - Whoever wishes to adorn any wood with divers colours, let him hear what I say. First make the wood very flat and smooth by scraping it, and lastly by rubbing it with that herb that you called shave-grass. But if the piece of wood is such that you cannot smooth down its inequalities, or you have reasons for not wishing to do so, and at the same time are not willing to cover it leather or with cloth, grind dry white-lead ..., but not so finely as if you were going to paint with it. Then melt wax over the fire in a vase, add tiles ground fine. Then mix it with the white-lead which you have ground, stirring it frequently with a small stick, and so let it cool. Then heat an iron, and with it melt the wax into the little fissures, until they are level, and then scrape off the rough parts with a knife. ... And when you have made it smooth, as I was saying, mix plenty of white-lead very finely ground, with linseed oil, and lay an excessively thin coat of it wherever you intend to paint...'

3. Marcianna Ms. 'Secreti Diversi', middle of the 16<sup>th</sup> c.

4.377. A most excellent glue for damp and moist places which always becomes harder, but only fears the heat, and fixes everything to wood and stone, which must be as smooth as porphyry. - Take one pound of good yellow wax, nine pounces of liquid varnish, and one pound of black naval pitch. Put the varnish into a pipkin over a slow fire, that is enough to liquefy without burning it; then through in the wax, liquefy it in

<sup>1</sup> This communication is a summary of varnish recipes from the sources analyzed by Marry P. Marryfield in the book 'Original Treatises, dating from the 12<sup>th</sup> to 18<sup>th</sup> centuries on the Arts of Painting, in Oil, Miniature, Mosaic, and on Glass; of Gilding, Dyeing, and the Preparation of Colours and Artificial Gems; Preceded by a General Introduction; with Translations, Prefaces, and Notes.' By Mrs. Merrifield, Honorary Member of Academy of Fine Arts at Boblogna, Translator of the Treatise on Painting of Cennino Cennini, and Authoress of 'The Art of Fresco-Painting'. London: John Murray, Albemarle Street, 1848.

<sup>2</sup> That is linseed or olive oil.



the same manner and incorporate it well with the varnish; then do the same with the pitch, having previously pounded it, etc. Then take Armenian bole ground to a fine powder, and stir some of it into the other ingredients until the whole material becomes liquid, and yet tenacious that it fixes and holds together things which you wish to put together; and you must stir the ingredients well together and use then warm, because in a short time the cement hardens so you can not glue with it. And when you applied it where you please, and wish to make the surface smooth and polished, take a firebrand from the fire and bring it near to the glue until the heat causes it to liquefy and spread; you should also move the firebrand over the surface of the glue, and melt it so that it at length becomes smooth and beautiful, &c.'

5.394. Modes of making divers varnishes; and first, of 'bengivi' (benzoin), which will dry in the shade. - Take 2oz. Of spirit of wine which has been distilled 4 times (that which has been distilled 3 times will do, but not so well), and one ounce of benzoin. Put the ingredients into a bottle, and shake them until the benzoin is dissolved; the varnish is then finished. It must be kept in a vessel closely stoped. This is a very fine varnish upon miniatures and all other delicate works, on paste, or glue, or wood, and also on paper and glass.

6.395. Item, a varnish. - Take one pound of linseed oil, boiled 'ut scis', etc., and anoint vessel with it while hot, and 4 ounces of pounded carabe (Carbone - in the Ms)(amber -M.M); place it to dissolve with the bottle closed on the coals, and when it is nearly dissolved pour in the hot oil and stop it up; afterwards, at the proper time, when the whole is dissolved, stir in 3oz. Of alum.

Dilute the varnish with the necessary quantity of naphtha, or linseed oil, or spirit of wine, and use it warm'.

7.396. Item, a varnish of benzoin, which dries very quickly and may be used on everything, because it is pale and admirable for all delicate works. - Put into a large vessel 5 ounces of good spirit of wine, with an ounce of fine benzoin pounded into very small pieces; stop the vessel closely, and agitate it until benzoin is well dissolved. Then let it stand for a day and night; pour off the clear part, throw away the sediment at the bottom, and keep the liquid in a well-closed glass vessel: this liquid is the varnish.

8.397. Item, an excellent varnish which is made without the aid of fire, which dries very quickly without being exposed to the sun, and remains very clear, and which may be varnished anything painted on panel, pasteboard, or iron. - Take spirit of wine which has been rectified at least three times, because otherwise it would not dissolve the benzoin properly, and put it in a glass vessel; than take some benzoin and add either at once, or a little at a time, that quantity which you know to be sufficient. Then stop up the bottle and agitate it until the benzoin is entirely dissolved; and, if, after it is dissolved, it is of the consistence of good 'vernice liquida', and, as it were, tenacious, and varnishes well, it is finished; but if it is too thick, add more spirit of wine until you bring it to the correct standard; and if it is too thin, add more benzoin. You may then preserve it for use'.

9.398. Item, a varnish tried by Master Jacop de Monte San Savino, the Sculptor, which is proper for every kind of work and on all materials. - Take one ounce of sandarac, ground to a very fine powder, and 3 ounces of clear nut oil. Heat the oil in a glazed pipkin over a slow fire in the same manner as linseed oil is boiled; then add the powdered sandarac a little at a time until it is dissolved; add to it also at the same time so much clear incense finely powdered as will impart a pleasant savour to the whole mixture, stirring it well that it may dissolve, and, if you please, you may also add a



sufficient quantity of burnt and pounded roche alum to have a sensible effect on the whole composition; and the addition of the alum will improve the varnish if you stir it until it is dissolved. It should then be strained through a linen cloth, and afterwards exposed to the sun and dew until a sediment is formed, which should be separated by pouring off the clear varnish, after which it will be ready for use'.

10.399. Item, a varnish which spreads like oil, dries quickly, and is very lustrous and beautiful, appearing like a glass mirror, and which is admirable for adhering firmly and varnishing lutes and similar things. - Take one pound of linseed oil, boil it in the proper manner in a clean glazed pipkin, add to it half a pound of well pulverized clear and fine Greek pitch, and stir and incorporate the whole over a slow fire; then add half a pound of powdered mastic, and the moment you have done so, withdraw the pipkin gradually from the fire, because it swells up, and incorporate the ingredients thoroughly; then replace the pipkin on the fire, and keep it there until everything is dissolved and incorporated. Then take the varnish off the fire and strain it through an old linen cloth. Your varnish is then made, and it will be found to be beautiful varnish for wood, iron, paper, leather, and all kinds of painting and works, and for withstanding water. When you find it too viscous, dilute it with linseed oil in the proper manner'.

11.400. Item, a most excellent varnish of mastic for lutes, leather, panels, cloth wood, and pasteboard. - Take 3 ounces of strained and clear linseed oil, and boil it. Then take half an ounce of mastic pounded and ground, and add it gradually to the oil, mixing it in such manner that it may be entirely dissolved and incorporated with the oil, and that it be properly evaporated and made into a varnish 'ut scis'; then put in a little pulverized roche alum at discretion, but sufficient to affect all the varnish; keep it over the fire until it is entirely dissolved and incorporated with the varnish and evaporated, after which you may take it off the fire, and strain it through an old and good linen cloth, when it will be finished. But observe that everything should be done over charcoal fire and with great care'.

12.401. Item. A most excellent mastic varnish. - Take one pound of mastic, half a pound of naphtha, and half an ounce of clear nut oil; melt them together in a bottle or glass over a charcoal fire, and strain through an old linen cloth'.

13.402. Item. A most excellent clear and drying varnish proper for colours, both in oil painting and other kinds of painting. - Take 2 ounces of clear and good nut oil, one ounce of clear and good Greek pitch, and half an ounce of clear and good mastic; grind the pitch and the mastic [separately] to a very fine powder, and place the oil in a clean glazed pipkin over a charcoal fire, and let it boil gently until it is done sufficiently, that is, until one third is evaporated; then put in the powdered pitch a little at a time, mixing and incorporating well; afterwards throw in the mastic in the same manner, and when it is dissolved, take the varnish off the fire and strain it through a fine and old linen cloth.

And if you wish it to be steel clearer, prepare the mastic with tepid water in the following manner; - Take the largest and clearest teas of mastic that you find, and soak them in tepid water, so that they may become tender; then select the best piece, dry them, and pound them'.

You may also try the effect of adding a little burnt and pulverized roche alum when the other ingredients are dissolved, so that the whole may virtually be seasoned with it, straining it afterwards. This is done in order to purify it better'.

14.403. Item. A varnish of 'olio di abezzo', which must be genuine and not adulterated, and if you wish to know whether it is falsified, distemper it with nut or linseed oil, or naphtha, heating both the oils, etc., and spread it on a work, when, if it is not genuine,



it will not dry a long time, and then badly, because it is adulterated with turpentine, but if it is genuine it will dry quickly and perfectly.

If you desire to varnish delicate works which will not be exposed to water, but merely to bring out the colours and show their beauty, distemper the olio abezzo as above. But if you wish to varnish more permanently on works which are intended to resist water, do not distemper the olio di abezzo with other ingredients, but heat it in a vase, melt it, and varnish with it.

When you distemper it with linseed or nut oil, let it be with oil which has been exposed to the sun to evaporate, and the varnish will be much clearer'.

15.404. A most excellent varnish for varnishing arquebuses, crossbows, and iron armour. - Take of linseed oil. Lbs.2; varnish in grains (sandrac), lbs.1; clear Greek pitch, oz.2.

Boil the oil, then dissolve in it the other ingredients, and strain through a much worn linen cloth, and when you wish to use the varnish, scrape and polish the work, and heat it in a hot oven, because that is the best place to heat it; and when it is of a proper heat, that is, when the varnish adheres to it firmly and does not fry [bubble or blister from too great heat], then lay it on thinly with an instrument of wood, so that you may not burn your fingers, and it will make a beautiful changing colour.

And if you supplied the Greek pitch with naval pitch, I think it would make the iron work black when you varnish it.

When making the varnish you must boil it well, even to such a degree as to make it foam and bubble, if necessary, in order that it may be clear and thick'.

16.405. Item. An excellent common varnish, good for varnishing whatever you please. - Take 2 ounces of clear and good linseed oil, and one ounce of good and clear Greek pitch, but 2 ounces of latter also will make the varnish thicker and give it more body; boil the oil over a slow fire, and then put in the pounded pitch a little at a time, that it may incorporate well, and add a little roche alum previously burnt and pounded, and when it is incorporated and boiled sufficiently, that is, when you try a little of it in your fingers and find that it is done, strain it and keep it. When it is used it will be beautiful and good; if it is too tenacious you will dilute it with a little oil'.

#### 4. Bolognese Ms, dated 15<sup>th</sup> c.

17.204. To make a certain water which is good for applying upon figures and miniatures. - Take oil of aloes, linseed oil, and liquid varnish, of each equal quantities; boil these ingredients together, and put them into a flask. When you wish to use the liquor, anoint with the figures or miniatures when they are dry, and not before, and they will be shining and very beautiful'.

18.205. To make linseed oil. - Take one quart of clean and pure linseed oil, damp it a little and then put it into a vase over the fire and stir it up with a spoon, and then push the spoon several times to the bottom so as to moisten all the seeds. You must add a little water in order to soften them; then put the seeds into a strong woollen cloth, place it in the press, and the oil will flow out'.

19.206. To make liquid varnish. - Take of the gum of the juniper [sandrac], two parts, and one part of linseed oil, boil them together over a slow fire, and if the varnish appears to you to be too stiff, add more of the oil and take care not to let it catch fire, because you would not be able to extinguish it, and even if you could extinguish it, the varnish would be dark and unsightly. Let it boil for half an hour, and it will be done'.



20.207. To make liquid varnish in another manner. - Take 1lb. Of linseed oil, and put it into a new glazed jar, and then take 1/2 a quarter [of an ounce?] of roche alum in powder, and an equal quantity of minium or vermilion ground fine, and 1/2 oz. Of incense also ground fine. Mix all these ingredients together and put them into the oil to boil, stirring it with a stick; and when the oil is boiling, as it is likely to run over, have another glass jar ready, and put it by that which contains the oil, so as to catch the oil that runs over, in order that it may not run on the ground, and in this manner make it boil up 3 or 4 times, and each time pour back what has run over, on that which is boiling the jar. Having done this, set the fire to the oil on the right hand side with a lighted straw, and let the oil burn on the upper part, but so that the jar may not burn on the inside, in account of too great heat, for otherwise the oil would smell unpleasantly. When you light the oil with the straw, remove the jar from the fire, and let it burn while you can say three paternosters, then extinguish the oil with a wooden cover, putting it upon the jar, and when it is extinguish, remove the cover in order to let the vapor escape. Then put it back over the fire; do this three times, and it is done'.

5. Paduan Ms. 'Ricette per far ogni sorte di colore, etc.', ca. 1584.

21.45. A clear and fine varnish. - Take off clear Venice turpentine oz. iij. and of odoriferous oil of spike oz. J, melt them well together over a slow fire, and use the varnish hot, recollecting that if you are using it on wood you must first give it a good coat of glue, or distemper the colours with gum water, in order that the varnish may not penetrate'.

22.46. A varnish which has been tried. - Take equal parts of white mastic and linseed oil, put them together into a new pipkin over a slow fire, and when the oil is hot, add to it a little 'olio d'abezzo', and continue to mix.

23.47. Another good varnish. - Take equal quantities of red mastic well powdered and linseed oil with a little resin; put them over the fire in a new pipkin, stirring the ingredients continually for quarter of an hour, when it will be finished.

24.49. A varnish which dries directly. - Take equal parts of boiled linseed oil and white mastic, place them over the fire in a new pipkin with a little oglio di abezzo; let them boil while you can say a credo; then add to them spirit of turpentine, equal in quantity to half the oil, mixing it well with the other ingredients.

25.50. Another varnish which dries directly. - Put into a pipkin a proper quantity of mastic, cover it with a somewhat greater quantity of naphtha, and leave the pipkin over the hot coals until the mastic is dissolved.

26.51. A varnish which does not dry immediately. - Take of white mastic oz. J, of nut or linseed oil oz. ss; put the whole into a pipkin, and boil over a slow fire until all the mastic is dissolved; then add a little naphtha at discretion.

27.52. A varnish which has been proved to dry instantly. - Take of coarsely pounded white mastic oz. j, of spirit of turpentine oz. j, of naphtha oz. j, and of oglio di abezzo oz. ij; put all the ingredients into a glass vessel closely covered with paper; then put a tin pot over the fire, to the handle of which the glass must be suspended, being secured to it by a string; and put into the tin pot sufficient water to cover the glass. Boil the water for half an hour, and until the mastic is dissolved, taking care not to take out the glass while the water is boiling, as it would crack.

28.53. Another varnish. - Let any quantity of oglio di abezzo, naphtha, and mastic, be placed in a pipkin in the summer and exposed to the sun, and in this way excellent varnish will be made.



29.55. A varnish for old pictures.- Take linseed or nut oil, oil of spice, and powdered mastic, all at discretion; put them into a pipkin over a slow fire. This is found to succeed.

30.57. A varnish which does not dry immediately. -Take a pipkin, and put into it white mastic, linseed, or nut oil, at discretion; then boil it over a slow fire until all the mastic is dissolved.

31.88. To make Indian varnish. First notice. -You must first heat an earthen vase, and while it is very hot put into it the gum lac pounded and sifted through a silk sieve; then add to it about 1/4 of an ounce of colophony, and at the same time, that it may have a body, collect it on the end of a stick in order to present all parts of it to the fire, that it may all be of the same colour, and as soon as it is liquefied you will add to it, a little at a time, the powdered colours, observing that they must be quite dry when they are put in.

32.92. An amber varnish. - Take common turpentine, make it to boil for a quarter of an hour, add to it some amber well powdered on a marble, boil it for half an hour until the amber is liquefied, and take it from the fire. As soon as it is cold it will become hard; when you wish to use it, dilute it with oil of turpentine in order that it may liquefy, and it will be better to heat it slightly that it may be more manageable, taking notice that while it is hot, it should be passed through a cloth, and the part which passes through will be the best part. Apply it with the pencil or with the warm hand. It is necessary to acquaint you that this composition should be washed in hot water, after it has been strained, that it may be clean and pure.

33.93. Another secret to make the true Indian varnish. -Take gum lac and oil of spike, both of them clean and pure. The oil must be cleansed from its impurities with an equal quantity of litharge of gold; it must then be redistilled and again left to settle until it becomes clear after being passed twice through the still. Another vessel shaped like this must be procured, and for every four ounces of spice must be taken one ounce of gum lac (if it is very yellow and clear there is no doubt of its goodness); the whole is then to be placed over a charcoal fire and to be boiled until the colour is changed, and varnish becomes like honey. To know whether it is good, put drop on a knife, and if it remains united it is good; it must afterwards be poured through a linen cloth into a vase of majolika and preserved.

(Following indications on the use of different colours in several coats with this varnish)

34.94. A very clear varnish for pictures and paper alla Fiaminga. -Take 7 ounces of highly rectified spirit of wine, 2 oz of sandarac, and 2 ounces of olio d'abezzo. The sandarac, which should be very clear must be pulverized and put in a bottle with the olio d'abezzo, which also must be very clear. The spirit of wine must then be added, and whole boiled gently over the fire, until the whole is dissolved, keeping the mouth of the vessel well closed, that the spirit of wine may not evaporate. The varnish must then be strained into a glass vase, leaving the impurities at the bottom. When it is used it must be put into a majolica cup, the picture also must be heated, and the varnish applied with a pencil.

35.102. To make the finest Indian varnish. -Take oz.8 of gum lac, oz 4 of the white resin of Arabia (Oriental Copal?), oz3 of mastic, and oz 1/2 of borax; liquefy the whole in a glazed basin. When dissolved, strain them through a silk cloth; then take an ounce and a half of the composition, reduce it to powder, put the powder into a receiver, and throw on it half a pound of spirit of wine rectified four times, and put the receiver into hot ashes or a sand bath until the powder is entirely dissolved. The varnish will then be finished. It is then used in the following manner: - Add to it a 6<sup>th</sup> part, by weight, of



Spanish red (The Almagre of the Spanish writers. A pigment which is still sold at Venice - M.P.M.), and with this give 7 or 8 coats to the wood which you wish to varnish, leaving each coat 5 or 6 hours before the next is laid on. After it is quite dry, it must be polished with a small brush and olive oil; then two coats of varnish must be applied, and when it is dry it must be rubbed very softly with goatskin and with a tripoli powder and oil, when it will be done; but I warn you must follow the recipe exactly.

36.103. Another Chinese varnish. - Take of white carabe [amber] oz2, of gum lac oz1/4, and of rectified spirit of wine lib 1. The gums all be pounded, and put into a long-necked bottle, and left infusion for two days, in order that it may be perfectly dissolved, keeping the bottle well closed. The bottle must then be put in a sand bath of such a heat that the varnish will boil. It will then be finished.

37.106. Varnish is made as follows. - Take one ounce of juniper gum [sandarac], oz1/4 of pure and clear oglio di abezzo, which is called oglio d'abezzo for making varnish, oz1/2 of the best 7 times rectified spirit of wine. The sandarac must be ground up, and made into a paste with the abezzo. It must then be put into a bottle, the spirit of wine must be added, and it must be placed over a slow fire until it is well incorporated. When it is done, wood or glass which is to be varnished is painted with a tuft of feathers.

38.107. A varnish for miniatures and picture frames. - Take of spirit of turpentine lib1, of benzoin oz4, and of mastic oz2. Reduce the mastic to a very fine powder, and mix it with the benzoin in a varnished pipkin. Then put the spirit of turpentine into a bottle, which you must heat by means of water-bath, and then mix it with the benzoin and mastic in the pipkin; afterwards incorporating it with the other things over a slow fire, &c.

When this varnish is used on picture frames, you must add to it two ounces of sandarac also well pounded, and you must mix with the varnish the colour which you wish to apply on the frames.

39.143. To polish the work. - Rub it well with new cloth; then take fine Tripoli powder which has been well rasped and pounded finely with goatskin, and rub the work well, so that it will have a lustre; then take white wax, if you wish it to be still brighter, and rub it over the work, which will thus become most beautiful.

#### 6. Gian Batista Vopalto, 'Modo de tener nel dipinger'

40.F. Varnishes are of different kinds: some we make ourselves, others, such as the 'vernice grossa' and amber varnish, we purchase, but I make the mastic varnish myself.

S. Tell me how you make it?

F. I take pulverized white mastic, and put it into a pipkin with spirit of turpentine, or naphtha, in such quantities that the spirit of turpentine may rise two-thirds above the mastic in the pipkin. I then set the pipkin over the fire, and boil it until the mastic is perfectly dissolved, and sometimes add to it a little 'olio d'abezzo'. This serves for varnishing finished pictures, but if you wish to see divers modes of preparing these varnishes, consult Armenino da Faenza and Rfael Borghini...'

#### 7. Brussels Ms, Pierre Lebrun, painter, 1635.

'Recueil des essais des merveilles de la peinture'



41. To make very good varnish for varnishing gold and all other things. - Take benzoin, and grind it as finely as possible between two pieces of paper, then put it into a phial and pour on it some very good spirit of wine, which must cover the benzoin to the depth of 3 or 4 fingers, and leave it in this state for a day or two; then to half a phial of this spirit of wine you must add 5 or 6 blades of Saffron, slightly bruised, but not broken in pieces. When you have done this, strain it, and varnish with it something that has been gilt, which will then become very beautiful and shining; this varnish will dry very quickly, and will last several years. ... This varnish is very good for varnishing all things, as well painted as unpainted, such as tables, and boxes of nut tree, ebony, &c., gilt or not gilt, or copper, ...'

42. To make a varnish with mastic for oil paintings. - Take 2 ounces of hard mastic and one ounce of olio d'abezzo(?) (huile de sapin), put the last into a small new pot, melt the mastic over a slow fire, then add the oil, which must boil when mixed with it, and must be kept boiling very slowly; for if it were to boil fiercely, the varnish would become too viscous. To know when it is done you must dip a hen's feather in it; if this is burnt, the varnish will have been sufficiently boiled; then pour it into a phial or bottle to preserve it from the dust. When required for use it must be warmed in the rays of the sun.

43. Fine varnish (benzoin) is made with turpentine melted over the fire; when melted, remove it from the fire, and add oil of spike with mastic, and, if required, sandarac.

44. Gros [vernis] is made with turpentine, oil of turpentine, and resin, melted up together.



### Violin neck. The changes from baroque to modern.

First of all, about the terminology used herein. The terms *instrument* and *violin* are to be understood as *instrument of a violin family*. I refer to the treble, alto and tenor violin necks to display the evolution of its form. Cello neck, as it is known, have passed a similar way, although there have been distinguished differences in its very early age<sup>1</sup>.

Evolution of a performance practice determined the way the instruments were played. Playing position has made consequential influence on the whole set-up. The neck was one of the essentials that bore the changes in order to perfectly suite the ever changing musical demands.

#### *Playing positions*

1. The instrument is held on the solar plexus level. Iconographical sources suggest that, with a few exceptions, instruments bigger than treble violin were held this way<sup>2</sup>.
2. The instrument is held *just below*<sup>3</sup> or above the collar bone without a chin support, or chin-off<sup>4</sup>.
3. Chin braced grip.
4. Instrument held '*da gamba*'.
5. Instrument held in the right hand.

Dependence between the described playing positions and the form of the neck is obvious. I shall elaborate on this topic in details.

#### *Playing position and the form of the neck*

##### *1<sup>st</sup> Position*

This position is documented in the printed sources<sup>5</sup> and largely in the iconography. Generally the 16<sup>th</sup> – 17<sup>th</sup> cc neck must have been thicker. It is apparent that a

<sup>1</sup> I.e. *violone* age.

<sup>2</sup> This resolves a common among the modern viola players question: how such a big instruments as the *Medici* tenor viola were played. Jonathan Talbot, a leader of the violin band 'Braccio' (The Hague) proposed, that alto and tenor violas held at body's center or near the right shoulder could be supported with an aid of a strap, attached to the button of the instrument.

<sup>3</sup> F. GEMINIANI, *The Art of Playing Violin*, 1751.

<sup>4</sup> JOHN PLAYFORD, *A Breefe Introduction to the skill of Musick...*, London, 1654. 'The lower part of the violin is rested on the left breast, a little lower the shoulder...'; FRANCESCO GEMINIANI, *id.*, 'The Violin must be rested just below the Collar-bone...'; L. Mozart, 'Osnovatelnoje skrypichnoje uchilische', St. Petersburg, 1804, 'First way to hold a violin ..., a little above the breast...'; 'Another way is more comfortable ..., i.e. the violin is held against the neck...'

<sup>5</sup> JOHN LENTON, *The Gentleman's Diversion, or the Violin explained*, London, 1693. Riley: "Lenton cautioned against holding the violin under the chin as well as holding it as low as the girdle", which, "Lenton maintained, 'some do in imitation of the Italians'". DANIEL MERCK, *Compendium Musicae Instrumentalis Chelicae...*, Augsburg, 1695. 'Hold the Violin neatly below the left breast, leaving the arm free and not resting it on the stomach'. (quoted from: MAURICE WENTON RILEY, *The teaching of*



thicker neck is more comfortable in conjunction with this playing position. There is a number of paintings that show instruments with thick archaic necks. The famous Violletta of S. Caterina de' Vigri, Bologna, Corpus Domini Convent, ca. 1435, proves that these paintings do resemble some truth. Observe the drawing demonstrating the low playing position (see fig. 1).

Fig. 1



Observe the button. It rests on the wrist joint and the neck's body comfortably lies in the palm. It is obvious that a thinner neck will leave some extra space between the player's hand and the neck. Thence, the button will rub inconveniently against the wrist joint.

The thickness of the neck's root guarantees a twofold comfortableness, which will be explained after I make intelligible what the shifting technique is when playing chin-off (2<sup>nd</sup> Playing Position) or holding an instrument on the breast or solar plexus level (1<sup>st</sup> Playing Position).

Shifting upward is a little problem since the instrument is pulled against a player's body. Shifting downward require a motion contrary to the direction of shifting. If there is no such a motion the instrument falls down. The only medium to fulfill the charge is the thumb (see fig. 6). The thumb follows the motion of the palm during the shift and allows to pull the instrument in aforesaid contrary direction. The thumb starts its motion after the last note before the shift is stopped. Shifting down from high positions, the thumb presses against the neck pushing the instrument towards the body while the palm shifts down. The thumb takes its final position only after the following after the shift note is stopped. Geminiani thus describes it: 'It must be observed, that in drawing back the Hand from the 5<sup>th</sup>, 4<sup>th</sup> and 3<sup>rd</sup> Order to go to the first, the Thumb cannot, for Want of Time, be replaced in its natural Position; but it is necessary it should be replaced at the second Note.'

Thus the thickness of the neck's root insures the following:

- The inner length of the neck is shorter. Therefore the *thumb has a shorter distance to go when shifting, i.e. the distance between the 1<sup>st</sup> and the 3<sup>rd</sup> positions is smaller.*
- The out-line of the neck gently follows the curve of the hand. It is obvious that a thinner neck will leave extra space between the player's hand and the neck. Thence, the button will rub inconveniently against the joint.



While stability of this playing position is obvious<sup>6</sup> I should emphasize its admirable flexibility. The position of the hands doesn't change at all, or changes but little when changing the instruments (lutes, violins, viols). This is an important circumstance, because, often the same musicians played many different instruments. It is sufficient to move the instruments closer to the solar plexus and one has never stretch one's left hand when changing for a huge tenor violin, for instance, and the right hand draws closer (!) to the body (see fig.2).



Fig.2

However, holding the instrument on the solar plexus level limitates playing in the first 3 positions. Shifting *up* is a difficult and hardly possible trick because the wrist is bent to its limit already in the 3<sup>rd</sup> position (see fig. 3).

Fig.3



Shifting *up* is a difficult and hardly possible trick because the wrist is bent to its limit in the 3<sup>rd</sup> position.

<sup>6</sup> One has no fear of dropping an instrument when playing.



## 2<sup>nd</sup> Position

Changing musical demands and request for higher positions stipulated the following:

- The instrument was shifted up to the collar bone. This allowed more relaxed wrist and easier access to the higher positions, however, made the instrument less stable. Excessive thickness of the neck's root became unnecessary (see fig. 4) and even awkward.
- The thickness of the neck's root and the button were reduced. It has facilitated reachability of the 3<sup>rd</sup> and higher positions, but it has increased the *inner curve length*. Thence, *the way to go between the positions was lengthened*.
- Instability of the instrument and augmented awkwardness of a *shift down* appealed for development of a compensating shifting technique. That technique, apparently of the 17<sup>th</sup> c. origin, will form the basis of the whole violinistic practice up to the 20<sup>th</sup> century.

Fig. 4.



Excessive thickness of the neck's root became unnecessary and even awkward.

Talking about different playing positions it is essential to mention another important factor - position of the bridge. It has often been lower than the f-hole notches. The string length, therefore, was considerably longer than the normal modern length. It affected the distances between the positions on the fingerboard which were consequently longer. Probably the bridge was moved towards the fingerboard to shorten the distance of the shifts first, and only after that, the instrument was lifted up, and the neck's root has been trimmed, but it is hardly possible to say which change has taken place first, or they did both simultaneously.

The 18<sup>th</sup> century development of violin idiomatic technique has determined the position of the instrument above the collar-bone because only this position allow most flexible left hand (see fig. 5).





Fig. 5.

*3<sup>rd</sup> Position*

In the last quarter of the 18<sup>th</sup> c, the neck's *inner* length has been raised again, although yet not as much as that of the 19<sup>th</sup> or 20<sup>th</sup> century necks. Once again it was accomplished by cutting down the neck's root. It is remarkable, that the upper length remained unchanged<sup>7</sup> and, indeed, there was no serious reason for that. Growing demand for the higher positions stipulated the neck's inclination in the end of the 18<sup>th</sup> c. The neck has been inclined backward, which allowed *further thinning of the root*. This must have been a serious reason for inclination of the neck. Not the string tension. This resulted in such a great distance between the 5<sup>th</sup> and the 1<sup>st</sup> positions that the shift down without a chin support became truly stubborn, although the shifting technique itself remained basically baroque<sup>8</sup> (see. fig.6).



<sup>7</sup> See for more evidence: MARCO TIELLA & LUCA PRIMON, *Catalogo degli strumenti dell'Istituto della Pietà*, Venezia, ed. Moschini, Rovereto, 1991.

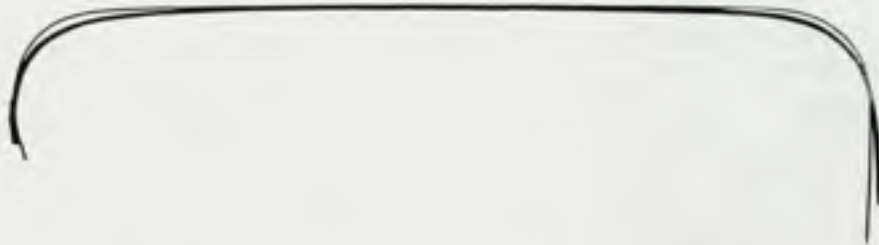
<sup>8</sup> Antedating movement of the *fingers* is the key. First described by Geminiani. KARL FLESCH, 'The art of violin playing', Boston, New York [etc.] C. Fischer, inc. [c1924-30], wrote: '...shifts... is one of the most difficult parts of the left hand technique.'; 'A shift down... is considerably more difficult than a shift up... a performer has an unpleasant feeling, as it seems, that a descending movement of the hand may *tear* a violin out of the support, made of a collar-bone, a shoulder and a chin... We are forced therefore to *subdivide the movement*, moving the thumb to the lower position aforehead...'. This technique also described by NEMIROVSKY, L.G., 'Mekhanicheskije I psikho(fizio)logicheskije momenty v osnovnykh priemah skripichnoj tehniki', Jurgenson, Petrograd, 1915. He wrote that antedating movement of the thumb is required when performing a shift down.



Fig.6. Antedating movement of the thumb during shift down. First picture shows a shift from a high position to the first position on the third finger. The second picture shows movement of the thumb into its natural position.

The fact that the shifting technique has remained fundamentally unchanged has determined the shape of the mid 19<sup>th</sup> c. neck, that is, of the neck which usually called today as a modern. This statement needs an analyze. J.-B.Vuillaume's necks, for instance, do differ from the late 20<sup>th</sup> century type. The drawing (fig.7) clearly illustrates the difference between the modern and Vuillaume's necks. The difference is still the same as between the early and late baroque necks: thickness of the root, thence, length of the inner curve. The root of the modern neck has been thinned down to its limit and the body of the neck became practically straight. This has facilitated the reachability of the 9<sup>th</sup> - 12<sup>th</sup> positions (Fig. 8), and the inner length of the neck became outmost. Players with relatively small hands had to seek for another shifting technique, because assisting movement of the thumb has lost its sense for the distance became too long.

Fig. 7



The drawing clearly illustrates the difference between the modern (from Weishaar & Shipmann, Violin Restoration, Los Angeles, 1988; *thin line*) and Vuillaume's (*bold line*, 1852) necks. The difference is still the same as between the early and late baroque necks: thickness of the root, thence, length of the inner curve, although the difference is more subtle. Note that the length of both necks is similar = 131mm.



Fig. 8

An instrument stabilized by a shoulder and a chin made the aforesaid assisting movement of the thumb, according to L. Auer<sup>9</sup> unimportant, and according to more

<sup>9</sup> LEOPOLD AUER, *Moja shkola igry na skripke*, Triton, Leningrad, 1933, p. 56: 'The thumb does not have very important role when shifting from one position to another. There is too much said, as it



modern Jankelevitch even harmful<sup>10</sup>. It is important to emphasize, that in spite of his statement about the assisting movement of the thumb, Auer played somewhat *all'antica*, i.e. practically without an aid of the shoulder. Moreover, described in the *School* thumb that follows the palm when moving in the positions is nothing else as the assisting movement. Some of the Auer's students did adopt this technique, others did not.

According to Strouve<sup>11</sup>, the modern schools of violin playing could be divided into two large and 'diametrically opposed' ways of holding the instrument:

1. Holding the instrument on the collar bone with a shoulder lifted up.
2. Holding the instrument on the collar-bone and between the forefinger and the left hand thumb, without a shoulder raised.

Furthermore Strouve writes, that the followers of the 1<sup>st</sup> method were 'Fritz Kreisler, L.Auer and others', whereas the followers of the 2<sup>nd</sup> method were 'Franz Vecsey, Bronislav Gouberman, Misha Elmann etc.'<sup>12</sup> Subdivision of the schools similar to the proposed by Strouve remain actual nowadays. For this reason the 19<sup>th</sup> c violin necks go transformed according to requests of the owners, or sometimes without the latter: just because the neck's shape does not mimic a template given in a manual (see Fig. 7).

Treatises of the 18<sup>th</sup> century pay remarkably little attention to the problem of shifting whereas the more recent books on the violin performance dedicate huge sections to the problems of shifting<sup>13</sup>. By no means, the 18<sup>th</sup> c. music is less difficult to play than the 19<sup>th</sup> or 20<sup>th</sup> music. However, the 18<sup>th</sup> c. treatises and left hand postures described therein make one conclude that the authors did not shift at all whenever it was possible. Indeed, high position of the thumb gives possibility of reaching higher positions without moving at all, or moving but little<sup>14</sup>. Actually, moving the thumb is the shifting, and a little moving is a little shifting.

High position of the thumb have been adopted by many violinists<sup>15</sup>. It economises movement in general. Shorter inner curve of the neck makes the movement still more economical.

seems to me, about importance of a thumb... The thumb must lightly touch the neck and follow the forefinger when moving in different positions, aiding the hand to shift up and down without clutching the instrument.'

<sup>10</sup> J.L.JANKELEVITCH, 'Pedagogicheskoe Nasledie', Moscow, 1993: 'Two movements performed instead of one...'. p.55.: 'Yampolsky considered the antedating movement of the thumb not only extraneous but even disarranging.'

<sup>11</sup> B.A. STROUVE, 'Tipovye formy postanovki ruk u instrumentalistov. Smychkovaja gruppa', Moscow, 1932, p.10.

<sup>12</sup> Strouve, id.

<sup>13</sup> SEMENTSOV, K.M., 'Iskusstvo skripichnyh smen', Moscow, 1971, p. 33: 'Shifting... can be considered one of the most complex barrier on the way of a correct frasing'. Id., p.22, Yankelevitch, Y.I.: 'The problem of shifts is one of the most important problems in violin performance'.

<sup>14</sup> Even Joahim (See: JOAHIM J., MOSER A., Violinshchule (1905). Berlin, N.Simrock. O.J.) recommends to avoid shifts when possible.

<sup>15</sup> Yankelevitch, id., p. 56, wrote that: 'L.Mozart recommended to keep the thumb closer to the middle finger rather than to the forefinger (i.e. in front of F sharp on the III string), bearing in mind that in that case there is more possibility of movement...' That point of view, according to Yankelevitch, does not differ from that of Moser (A.MOSER, Methodic of violinistic performance, Lipsia 1920), as well as from that of Auer and 'some others'. The authors who presume *high position* of the thumb are: Walter (See: W.WALTER, How to study violin, St. Petersburg, 1910) - the thumb has to be inclined in direction of the musician's body; Campagnoli (the thumb is held against B on the G string) [see: CAMPAGNOLI, op.cit., Lipsia 1797], Auer (the thumb is held against F natural on the D string); the



While the first three playing positions were basically important for the violin development, there were two other: 'da gamba' as well as holding the instrument in the right hand. These did not contribute much into the history of the violin.

The cello's neck has passed a similar way, at least, since the time it has emerged. The old *violone* must have had a period of long necks, probably, prior to the introduction of metal wound bass strings<sup>16</sup>.

I hope this article will stimulate experimenting with the earlier types of the necks. I would be thankful to anyone for comments.

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authors who presume lower position of the thumb are: Beriot (the thumb is held against A on the G string); Singer and Seifriz (same position as in Beriot) [See: Singer Ed., *Theoretical and practical school for violin*, Berlin, 1887]; Joachim and Moser state the lowest position for the thumb - against the forefinger; Koeckert (G.KOECKERT, *Tecnica razionale del violino*, Lipasia 1909) - it has to 'look' in direction of the nut. Yankelevitch, p.56, wrote that all the evidence 'insists on the fact' that the violin playing schools do not have any universal idea on where to keep the thumb during execution.

<sup>16</sup> NEAL ZASLAW, "Lulli's Orchestra", J de la Gorge & H., Schneider, Laaber, 1991, p.542-43, 'The instruments neck is roughly one-and-a-half times the length of its body... There are 16th and 17th c. pictures from other countries showing such long-necked 8' bass instruments, and there are also other pictures with large bowed instruments played across the chest. These pictures have generally been laughed at as fantasy or incompetence on the part of artists, but they should perhaps be taken more seriously. There were, in any case, physical and acoustical reasons for making the necks extremely long on 8' bass instruments prior to the introduction of wound or overspun strings'.



### Some evidence from an old violin

The violin described hereafter is one of dozens "uninteresting" from a common viewpoint instruments. However, it is a rare one, that deserves some description, because it preserves a few bits of evidence about the instrument making past.

Being conveyed to paper, this information will be preserved even if the violin itself will probably be modified in the future in order to conform with the ever changing standards, and the evidence it otherwise might represent destroyed.

As in the condition before restoration:

- 4 damaged corners and 2 damaged lower edges of the table;
- A deep concave deformation under both of the bridge feet and a short sound-post crack ca.15mm;
- Presumably 19<sup>th</sup> century neck graft, 130mm long, 23.5mm (!) narrow at the upper end;
- 2 flame cracks in the ribs, and some worm damage;
- Heavy worm damage of the two lower linings along the table;
- F-hole crack, initializing at the lower curve of the *f* and extending down to the lower edge of the table;
- Damage around all 4 peg-holes; missing pegs;
- Missing bridge.

Involved procedures:

- Restoration of the corners and edges of the table;
- Restoration of the curvature of the table in the sound-post area, involving removing the original bass bar, repair of the sound-post crack, patching the table in the sound-post area, and fitting the original bass bar back into its original position;
- Neck graft, fingerboard and a tail-piece in the style of the late 18<sup>th</sup> century;
- Repair of the flame cracks in the ribs and replacement of the missing wood in the areas of worm damage;
- Replacing worm-damaged linings;
- Repairing the f-hole crack; crack filling and retouching the crack area;
- Peg-hole re-dressing and replacement of the missing pegs;
- Manufacturing a new bridge.

#### Table and back

The inner parts of the instrument have a deep brown color, almost black around the *ffs*. The black resembles the lamp black. Whatever the origin of that color is, apparently the instrument was never modified inside, and therefore the thicknesses of the both table and back and the original bass bar are unaltered. Dark color of the inner parts reminded about a method of smoke-drying the parts before assembly, mentioned by L.Mozart in *Versuch* (in St.Petersburg edition of 1804). The workmanship of an outmost accuracy. Fig.1 demonstrates the details.



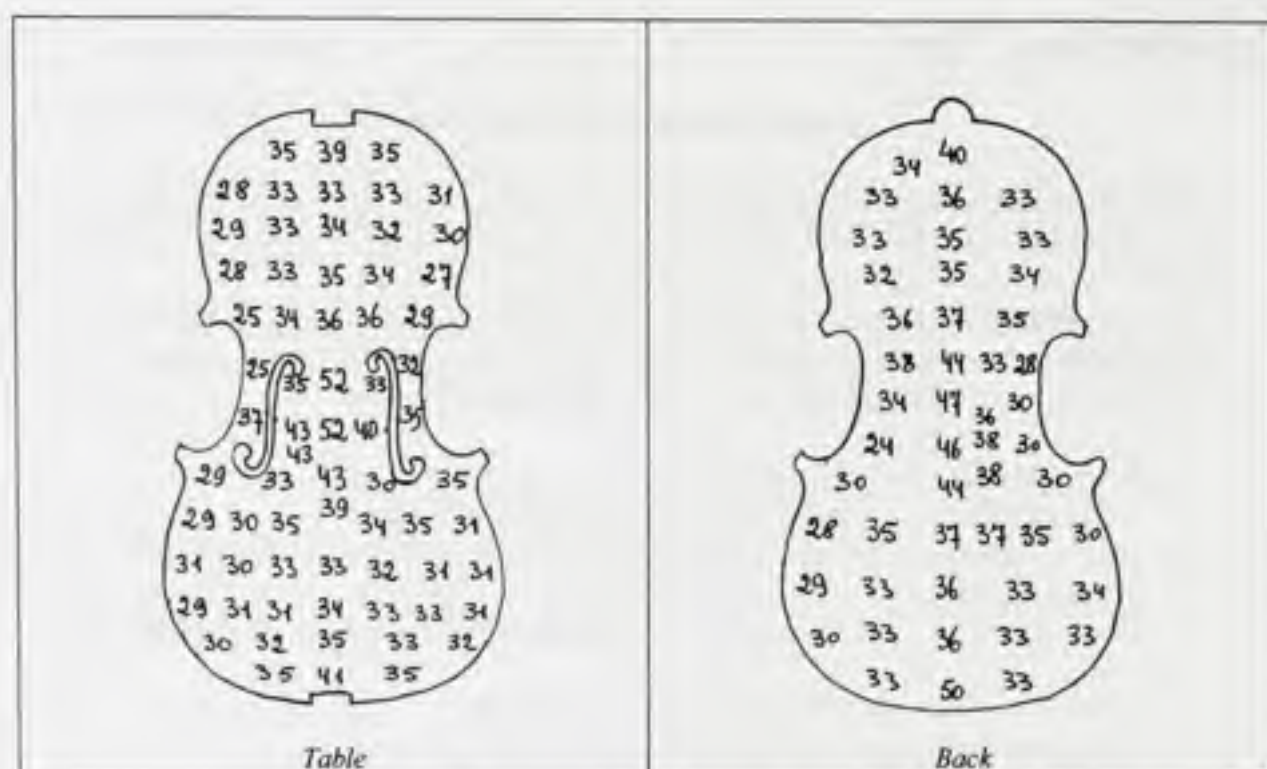


Fig.1 The thicknesses of the back and the table.

The thicknesses of the table and back are remarkably thick. For some mysterious reason this violin escaped from the late 18<sup>th</sup> century modifications, which involved scraping the backs and tables in order to achieve a different ideal of sound. Salabue expressed that ideal as follows: 'A good violin must have a robust sound, strong, but beautiful and not screaming (*striduta*), as sweet and as clear as possible, but the principal merit consists of equality of the sound on all of the four strings either the top string or the bottom.'

#### Bass bar

An original bass bar (fig.2) is another piece of particular interest. Since the table had to undergo an arching correction, repairing the sound-post crack and patching, the bass bar was needed to be removed. A painstaking procedure was executed in order to preserve it for consequent fitting back to the table. Fitting it to the table was executed with an aid of counterforms and molds (fig.3).

There was a popular belief that an old bass bar has to be replaced because it does not function, so to say, gets tired. For this reason old instruments are often furnished with modern bass bars, fitted with tension. However, the earliest method book, that of Bagatella (*Regole...*, 1782), does not mention that the bass bar has to fit with tension. Apparently the practice of fitting bass bars with a tension started some time in the beginning of the 19<sup>th</sup> century. Cozio di Salabue wrote: 'in setting the bass bar it is not needed to make it pull the table too much, but a little' (*Nel collocarvi la catena non bisogna molto, ma poco anzi, farle tirare il coperchio...*). However later in 1834 Maugin does not mention that the bass bar must fit with some tension.

Regardless with the thickness or thinness of the bass bar, fitting with a tension will deform the table. Not the vice versa. Thence it is not recommendable to fit bass bars with tension on the old instruments. In most cases there is no reason to replace old bass bars. For the sake of instrument preservation (and, indeed, for the sake of its sound), the bass bar must fit without any force or springing action, even if the thicknesses of the table are little.



In that case somewhat more robust bass bar without tension will do and prevent the table from deformation under the pressure of the bridge.

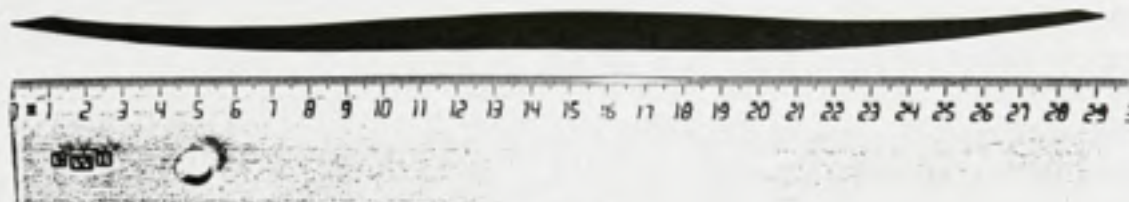


Fig.2 Bass bar.  
Thickness 4 mm, length 290mm, height 12mm.

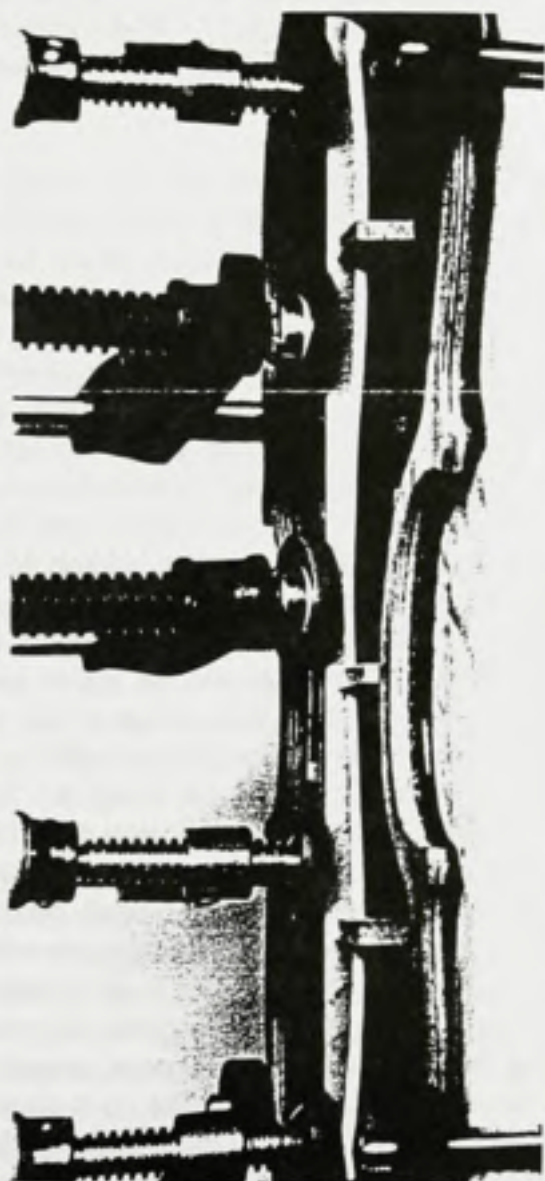


Fig.3 Re-gluing the original bass-bar into its original position



Fig.4 Photograph of the instrument.



### Queries about the dichord

I have been trying to find information about the dichord and wonder if any Fomrhi members can help. Apparently it is a derivative of the monochord, which was used as a teaching instrument of philosophy from Ancient Greece. Did the Greeks actually invent it?

Guido of Arezzo used it when training his choir, but what fascinates me is how the sympathetic string was introduced inside the soundbox of the dichord in about the 12<sup>th</sup> century. Why was it introduced and where did it come from? If the crusaders brought it back from the Middle East or Eastern Europe, what inspired the concert of listening to an inner string vibrating as a function of playing the outer string? Could it have begun further east in China? A final question is whether there could be any significance in relating the dichord or monochord to harmonic architecture, since churches and cathedrals also had a sympathetic tone, making a difference to how the music was sung. Can anyone shed any light on these questions?



**Following Comm 2009, a Venetian monochord (dichord? tetrachord?)**

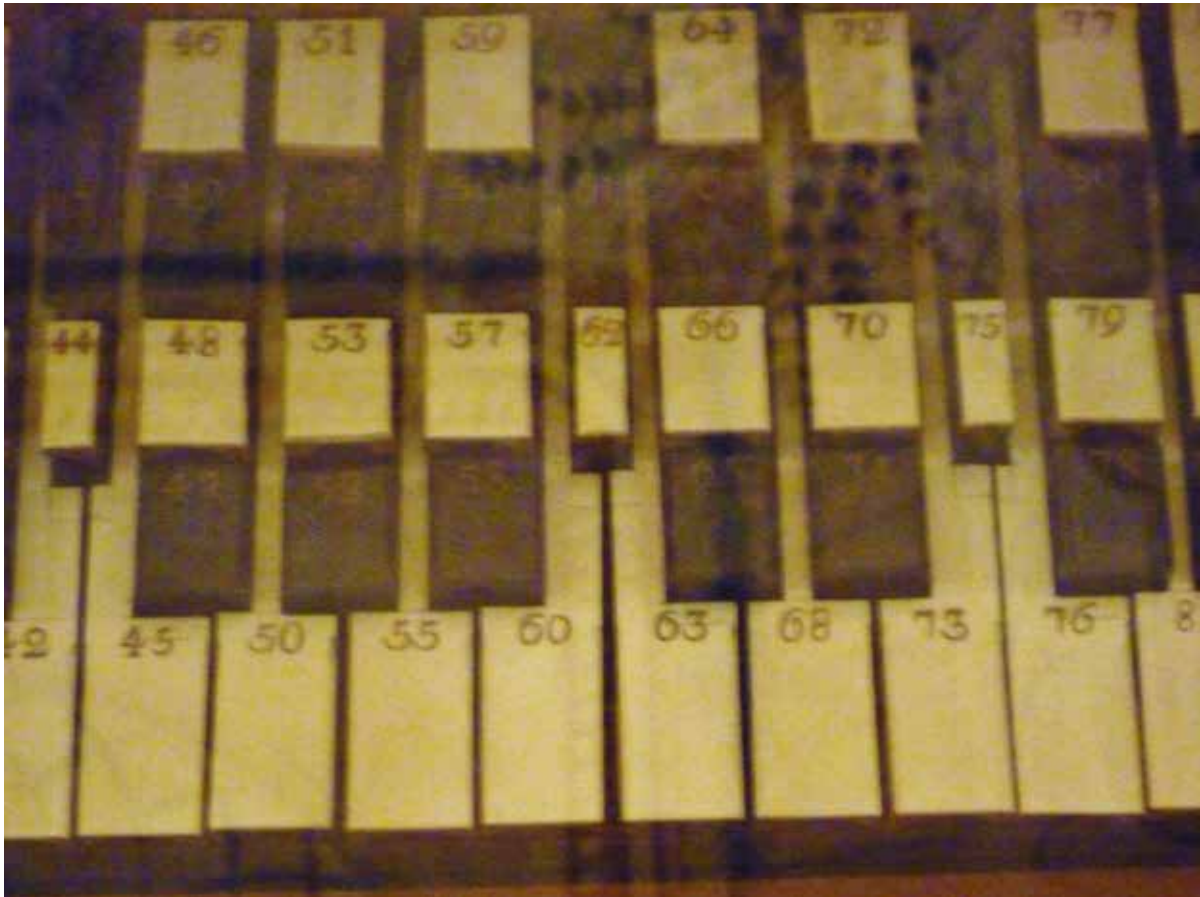
Following the ‘queries about the dichord’ expressed in Comm. 2009 readers might be interested to see this example of an early 17<sup>th</sup> century monochord – or more strictly tetrachord, though the layout of the strings suggests a double strung dichord, in the Museo Internazionale e Biblioteca di Musica di Bologna. It was made by Vito Trasuntino in Venice in 1606, and sits in the same case as a triple manual harpsichord by the same maker.



The intention of this instrument seems to have been to help correctly tune the microtonal harpsichord, labelled ‘Clavemusicium omnitonum modulis diatonicis, cromaticis, et enamarmo[nici]s’, whose three manuals, with numbered keys, could be used to demonstrate the three types of harmony: diatonic, chromatic and enharmonic. The museum acoustiguide which gives a splendid musical guided tour, with many recorded music examples, includes a demonstration of music played on this keyboard, though alas my ear is not really good enough for me to be moved to different emotions by the different types of harmony, as the ancient Greek theorists no doubt thought they should be . . .







The other music museum in Bologna, by the way, the Tagliavini Collection, boast this old overwinding machine, whose workings are plain enough to require little explanation:





**Is this the bench that launched a thousand lutes? A possible workbench and tools of Northern Italian and South German string instrument makers of the late 1500s.**

In the Museo Civico in the Italian town of Bolzano/ Bosen there is a guild table and chest, shown in Fig. 1, (1)



Fig. 1. Guild table and chest

This table has inlaid around its edge the date 1561 and the name Hans Kipferle - presumably the maker? But what makes the table really interesting are the many detailed intarsia representations of the tools of the wood worker, and in particular of the intarsia worker, which cover the rest of the table top shown in Fig.2.

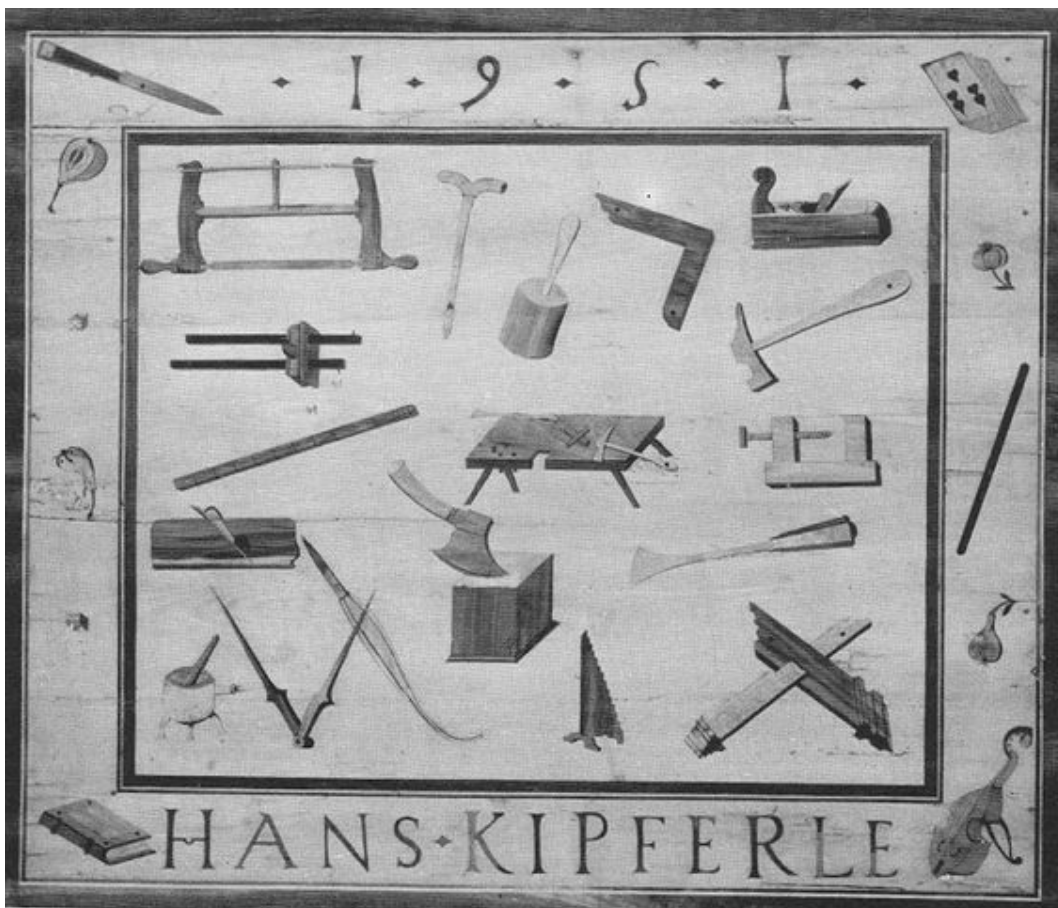


Fig. 2. The top of the Guild table in the Bolzano museum.



Walnut, maple, and other woods were used for the intarsia and the table top measures 125 x 108 cm. The tools depicted on the table top are (clockwise): a frame saw, an auger, a mallet, a try square, a plane, a hammer, a wooden screw-clamp, a chisel, two interlinked wooden squares?, a bench support, an axe, a shoulder-knife, a compass, a gluepot, a moulding plane, a rule, a double marking gauge and finally in the middle the work bench on which another hammer and chisel are shown.

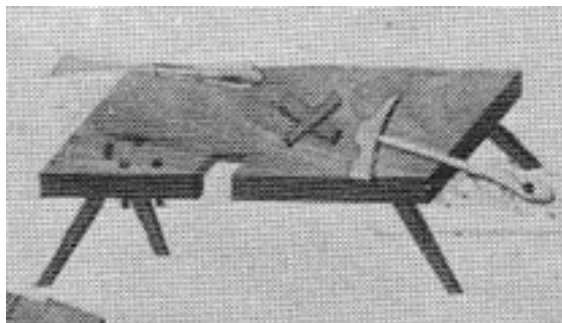


Fig. 3. Enlarged view of Hans Kipferle's bench of 1561

The bench is of particular interest to me as I am interested in attempting to recreate and investigate past instrument makers' tools and techniques. As you can see in the enlargement (Fig. 3.) it has not got a screw operated vice but instead it has a notch cut out of its front edge which is used, in conjunction with wedges, to act as a vice. What I believe are a pair of wedges are seen on the bench next to a hammer, which would be used to tap and tighten the wedges to grip a work piece placed in the notch. Also to the left of the notch, pegs in holes can be seen, the holes are positioned, to be used with wedges again, to hold material being worked on top of the bench. (A similar triangular arrangement of hole and pegs are used by green woodworkers today on their 'bodger's benches'.)

### **The location of Bolzano near important instrument making centres**

The table, as I have already said is in a museum in Bolzano and I am presuming it was made locally. (I would welcome any information on the provenance of the table if anyone has any more details)

Bolzano, located in South Tyrol, Italy is on the way to or from several important string instrument making centres of the renaissance. (See Fig.4.) and seems to me to be on a main trade route across the Alps between Italy and Germany and Austria.

Bolzano; to Fussen Germany is 224 km north over the Alps,

to Mittenwald is 153km,

to Nuremburg is 431km,

to Cremona Italy is 236 Km South,

to Brescia Italy is 190 km,

to Venice Italy is 221km,

to Absam Austria 129 km.

Bolzano is located on a main trade route taken in the past by craftsmen and tone woods and tools across the Alps. It is likely that ideas were also transmitted along this same route. Instrument making ideas, tools and techniques would have travelled over the Alps along with the goods and people who passed through Bolzano. I believe Hans Kipferle's table of 1561 is so interesting because it is a rare record of tools and ideas that were being disseminated along the route through Bolzano between Fussen



and Venice or between Cremona and Absam? It seems likely to me that the violin makers of Cremona and Lutemakers in Fussen in 1561 would have known of and probably used tools and benches very much like those illustrated so well on this table top.

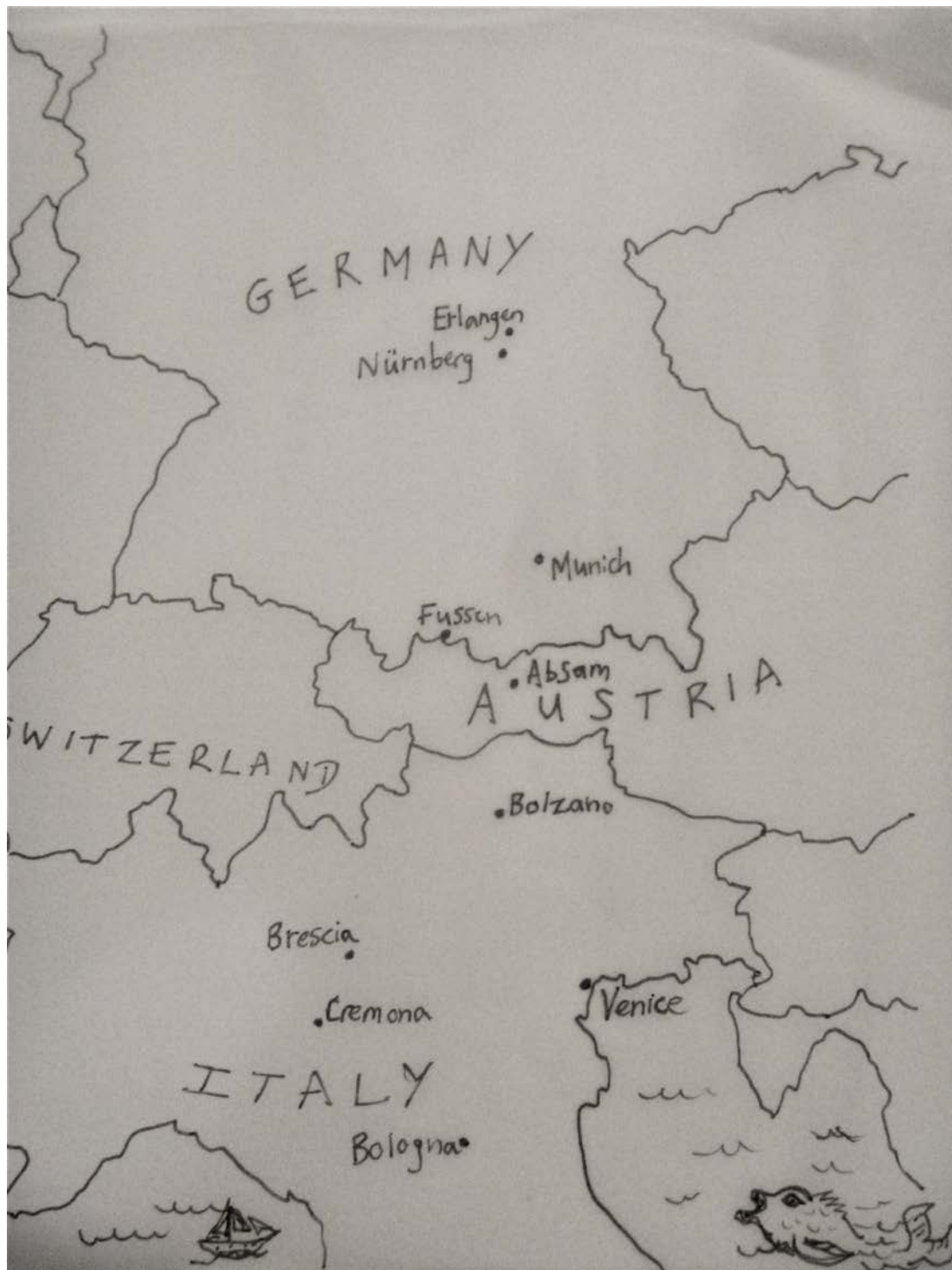


Fig. 4. Map showing the location of Bolzano and important instrument making centres



## An instrument maker's bench of 1561

I have attempted to recreate the features of this bench and find that it works quite well. I constructed a small bench top to be used fixed to my modern bench. Fig. 5. Shows the small experimental bench top with its vice notch and pegs along with a flared chisel, wedges and hammer as shown on the table top.



Fig.5. Small experimental Hans Kipferle bench top.

Fig. 6. Shows a piece of wood, a violin Scroll, wedged into the vice notch while being sawn. I strongly believe in the great value of attempting to physically recreate historical techniques as I find that practical information and ideas tend to present themselves and can be gained quite readily. Looking at historical pictures and documents provides a starting point for practical recreations a bit like the way a holiday brochure and postcard may give you an idea about a destination but you find out different information by actually going there? When I first tried wedging a work piece in the notch it didn't grip well. I soon discovered the vice notch worked much better the work and wedges didn't slip if it was undercut a small amount, preventing the wedges and work piece from being easily pulled outwards when horizontal force was applied such as when sawing or chiselling. Also moistening the wood surfaces improve grip. I would not have worked these things out as easily without actually making and trying the vice notch out.

Fig. 7. Shows pegs and wedges used to hold work on the top of the bench. The pegs work quite well and can be used as bench stops or as here with wedges to hold objects of many shapes and sizes.



My experiences with my Hans Kipferl style bench top over the past few years have proved to me that it is a versatile bench with features that work well and some of which could be useful even in a modern workshop. Ideally I would like to make a full sized version but I haven't the space at the moment.

I am continuing to experiment with and learn from this small bench top, I have already used parts of it for much of a project where I made a lute from the instructions given in Arnaut of Zwolle's manuscript from about 1440 (2) and am slowly attempting to use it to make some violins using historically informed methods and I plan to write a bit more about this as the instruments progress.

I believe trying to recreate the methods of the makers of the past may help us understand how they worked and maybe help us understand their work a little better or differently? Last but not least I also find attempting to recreate past methods very enjoyable.



Fig. 6. The vice notch in action. A violin scroll being sawn. (Apologies for the historically inappropriate tea mug in the background.)





Fig. 7. The pegs and wedges in action, chiselling work on top of the bench

Notes.

1. Fig 1. And 2. Taken from <http://thomasguild.blogspot.co.uk/2013/04/woodworkers-guild-chests.html>
2. For my historical lute building project using parts of the above bench, other benches, historical sources used and attempts at re-creations see <http://www.lutesociety.org/pages/building-lute-original-methods>



## Oil paintings of musical instruments- should we trust the Old Masters?

David Hockney carried out research at the very end of the 1990's into certain painting techniques used by many of the 'Old Masters'. I have no idea if this is widely known by instrument makers and researchers. It culminated in a lavish book published in 2001 entitled *Secret Knowledge- Rediscovering the lost techniques of the Old Masters*. I was first made aware of his research through a fascinating TV program that he made, which fortunately I videoed and have watched many times. I have heard some hearsay that it caused a bit of a stir among art historians. I do not know whether this stir was of the "We-knew-about-this-all-the-time" or "Hockney-is-talking-a-load-of rubbish" variety. But I do know that anyone who has ever been involved in interpreting the evidence of musical instruments painted by the Old Masters should read this book.

An enormous advance in realistic painting took place around 1430- 1440. This has long been noted by art historians but it has never has been properly explained. Hockney gives a very clear case that from this period onwards many of the Old Masters were using convex mirrors to project the image onto the canvas.

If you already find yourself sceptical about this I really encourage you to read his book as the evidence is compelling. It certainly has changed the way I view paintings from this era. Now it becomes clear *why* so many old Flemish portrait paintings measure about one foot square. This is the optimum size for a projected image using a concave mirror. Most of us will be familiar with early portraits where the background is very dark, yet there is bright light on one side of the subjects face. And the irises of the subject are contracted. The subject would have been sitting in full sunshine and the artist would be painting in a darkened area using the image projected by a concave mirror.

The next big advance came around 1510 when there had been significant advances in glass making which allowed lens maker to supply artists with lenses that they could use for this purpose.

Long before I knew anything about Hockney's research I enlarged to life size the Albrecht Dürer woodcut of a bagpiper and mounted it on plywood- it stands about 5 foot high. I usually take it to The London Early Music Exhibition to jolly up my stall.

The original woodcut is post card sized and yet when I had it enlarged all the proportions of the bagpiper still remained absolutely correct. I often mused that it seemed to have a 'photographic look' and marvelled at Dürer's skill to draw such a small figure with perfect proportions. He made that print in 1514, which is only four years after lenses started to be used by artists.

A lens reverses the image it projects. A clue that Dürer used a lens for this print is that the image is 'back to front'. The piper is 'left handed'. And, yes, it is quite possible that he actually *was* a 'left handed' piper. But you try looking at any paintings of musicians and see how many of them suddenly become left handed after 1510!

Working in conjunction with an optical scientist Hockney gives a detailed analysis of some of the inevitable distortions that appear when an artist tries to fit several projections together into a complete painting. He shows various 'clues' one can look for.

Once one can spot these 'clues' and can be confident that the artist has painted using this technique one can have much more confidence in the dimensions of a musical instrument in a painting.

*Secret Knowledge- Rediscovering the lost techniques of the Old Masters*. David Hockney (Thames & Hudson) 2001 ISMN 0-500-23785-9