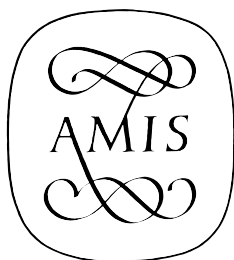


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The Jamestown Mouthpiece: A Historical, Technical, and Comparative Study*

SABINE K. KLAUS AND STEWART CARTER

A lip-reed instrument's mouthpiece is crucial to its tonal properties. Far fewer early mouthpieces survive than instruments, however—an unfortunate circumstance that is the result of the object's small size and the fact that it was customarily detachable from the instrument itself. The unearthing of such an object more than four hundred years old is thus a matter of considerable importance to historians of brass instruments.

In October 1994 Preservation Virginia archaeologists uncovered a trash pit of circa 1610 associated with James Fort, England's first successful transatlantic colony in what is now the United States. Recognizing that one of the artifacts from the pit might be a mouthpiece for a brass instrument, curator Beverly A. Straube contacted one of the authors, Stewart Carter, in 2006 and invited him to inspect the object.¹ In October 2007 both authors looked at the fragment together, taking detailed photographs and measurements. In February 2008, upon our request, the object's metal content was analyzed by Emily Williams, John Watson, and Olga Trofimova, a team of conservators and metallurgists at the Colonial Williamsburg Foundation. This was done in the hope that metal analysis would shed light on the age, provenance, and original design of the mouthpiece.

A Brief History of James Fort and Its Excavation

In December 1606 more than one hundred men and boys left Blackwall, near London, in three small ships—the *Discovery*, the *Susan Constant*, and the *Godspeed*—under the sponsorship of the Virginia Company, a joint-stock corporation chartered by King James I. Their principal objective was to settle the area of North America that later became

*For their assistance in our research, the authors would like to thank Louise Bacon, Beatrix Darmstädter, Martin Kirnbauer, Graham Nicholson, Myra Stansbury, Beverly Straube, Olga Trofimova, Hannes Vereecke, John Watson, and Emily Williams.

1. Object number 171-JR, recovered from layer 2G of Pit 1.

the Virginia Colony, named for the Company. After passing through Chesapeake Bay and following the James River (fig. 1), they landed on what is today known as Jamestown Island in May 1607. The Virginia Company had close ties with the Society of Mines Royal and the Company of Mineral and Battery Works, both established by Queen Elizabeth I to foster the mining of metals, which were desired by the crown for the development of wealth and military power. The explorers hoped that in America they would discover deposits of gold and other metallic ores, such as calamine (the ore containing zinc, a metal needed to produce brass), which were in short supply in England.

Prior to 1994 the original site of James Fort was thought to have been washed away by erosion of the James River shoreline and lost forever.² But an extensive archaeological search around the brick church tower, the only seventeenth-century remnant of the Jamestown settlement above ground, unearthed evidence of the fort, as well as numerous objects that document daily life in early seventeenth-century America. A trash pit excavated in 1994 yielded, among many other objects, the mouthpiece that is the subject of this discussion.

The Arrival of the Mouthpiece in America

Following the initial landing in 1607, several other ships arrived over the next three years, any of which might have carried this mouthpiece to the Jamestown colony. The context of the excavation offers two possible explanations for the presence of the mouthpiece: it may have belonged to a brass instrument that was used on one of the ships and in the newly established fort; or it may have left England in its present incomplete state, together with other old metal fragments. The explorers are known to have brought scrap metal with them in the hope of finding other metals with which the scrap could be smelted.³ The exploration of these two possibilities is important for the interpretation of the mouthpiece. If it was used on one of the ships and/or in the fort, it most likely belonged

2. William M. Kelso, with Beverly A. Straube, *Jamestown Rediscovery*, 1994–2004 (Richmond, VA: The Association for the Preservation of Virginia Antiquities, 2004), 33.

3. Carter C. Hudgins, "Old World Industries and New World Hope: The Industrial Role of Scrap Copper at Jamestown," *Journal of the Jamestown Rediscovery Center* 2 (January 2004), http://apva.org/rediscovery/pdf/hudgins_low.pdf (accessed April 15, 2009).

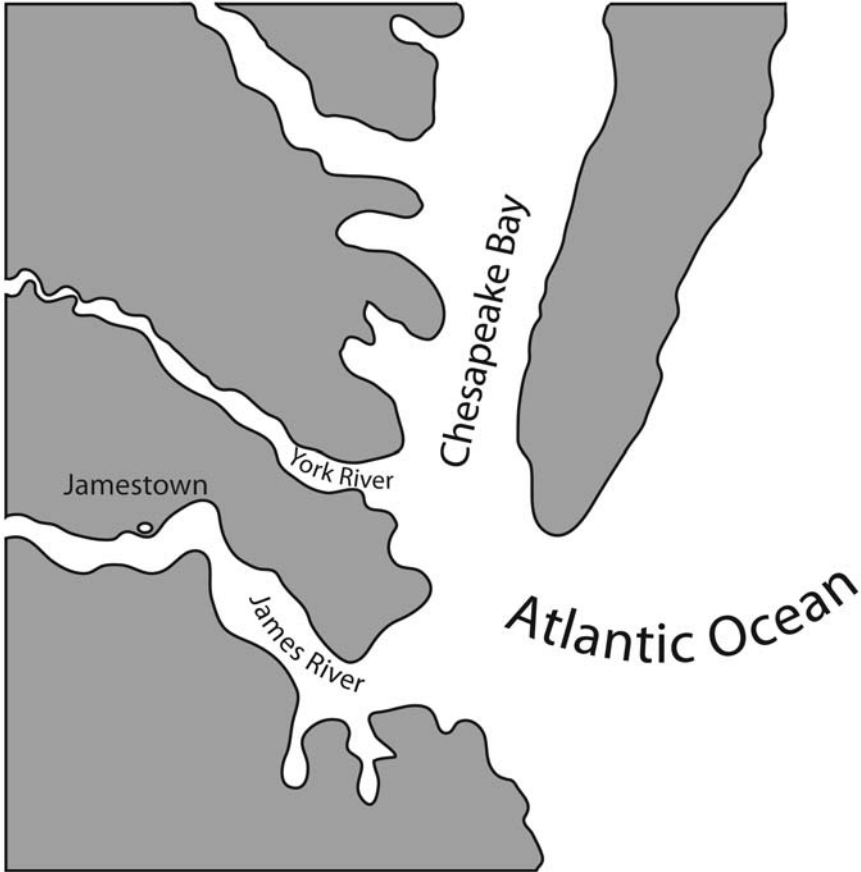


FIGURE 1. Map showing the location of Jamestown. Drawing by Sabine K. Klaus.

to a signal trumpet. If it was brought to the New World as scrap metal, it could have belonged to a trumpet or a trombone.

The first possibility seems the more likely of the two, as one of the colonists, Captain John Smith, mentions trumpets several times in his writings. Smith was a prolific writer whose published works exerted enormous influence on subsequent travelers and secured for their author an enduring place in history. In *An Accidence or the Path-way to Experience Necessary for all Young Sea-men* (1626) and *A Sea Grammar* (1627), he writes of the duties of a ship's trumpeter and even specifies the share of the profits the trumpeter and trumpeter's mate are to receive from a

merchant voyage.⁴ More to the point for the present discussion, however, are Smith's descriptions of his exploits in Virginia. In *A True relation of such occurrences and accidents of noate, as hath hapned in Virginia . . .* (1608), Smith describes a meeting with Chief Powhatan: "But seeing Captaine Nuport, and Maister Scrivener, coming a shore, the King [i.e., Powhatan] returned to his house, and I went to meete him [i.e., Newport]. With a trumpet before him, wee marched to the King, who after his old manner kindly received him."⁵ In *The Generall History of Virginia, the Somer Iles, and New England . . .* (1623), Smith describes negotiations with Powhatan's men that took place in 1611: "Yet wee promised them truce till the next day at noone, and then if they would fight with us, they should know when we would begin by our Drums and Trumpets."⁶ Thus it is clear that the English colonists in early Jamestown used trumpets ceremonially and to signal military action.

Physical Characteristics of the Mouthpiece

Only the upper brass-colored bowl of the mouthpiece survives, while the shank—the segment that was inserted into the instrument—is lost (figs. 2 and 3), as is also, most likely, a ferrule that covered the junction between bowl and shank. The lower end of the bowl is stepped and shows a darker, grayish color, suggesting that a separate shank was once soldered to it. The exterior is decorated with a series of engraved lines and is nicely finished. The cup-shaped interior has a flat rim with a fairly sharp inner edge (figs. 4 and 5). The transition between cup and throat shows a distinct step, as is typical of a mouthpiece for either a trumpet or trombone from this time. Although it is well crafted, the mouthpiece is not totally symmetrical. The slope of the wall on the interior is steeper on one side than it is on the other, and when placed upside down on its rim the vertical axis is not perpendicular to the plane of the rim. The dimensions of the mouthpiece are rather large (fig. 6); the significance of this will be discussed below.

4. See *An Accidence*, 19 [3:22], 25 [3:23], and 35 [3:27]; and *A Sea Grammar*, 35 [3:83], 39 [3:86], 60 [3:102], 62 [3:103], and 72 [3:110]. In this and in the following notes, page numbers in brackets identify the location of these passages in *The Complete Works of Captain John Smith (1580–1631)*, ed. Philip L. Barbour, 3 vols. (Chapel Hill, NC: University of North Carolina Press, 1986).

5. *A True relation*, fol. D1v [1:69].

6. *The Generall History*, 113 [2:245].



FIGURE 2. The mouthpiece fragment, exterior view 1. Photo by Sabine K. Klaus, published courtesy of Preservation Virginia. For color view, see p. 18.



FIGURE 3. The mouthpiece fragment, exterior view 2. Photo by Sabine K. Klaus, published courtesy of Preservation Virginia.



FIGURE 4. The mouthpiece fragment, interior view. Photo by Sabine K. Klaus, published courtesy of Preservation Virginia.



FIGURE 5. The mouthpiece fragment, side view. Photo by Sabine K. Klaus, published courtesy of Preservation Virginia.

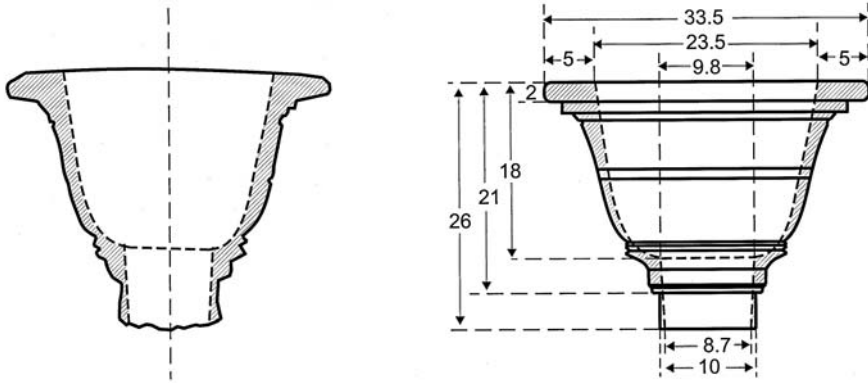


FIGURE 6. Drawing and measurements of the mouthpiece fragment. Drawing by Sabine K. Klaus, published courtesy of Preservation Virginia.

After excavation, the mouthpiece was immediately cleaned mechanically, abraded with aluminum oxide powder, and polished with an undetermined compound. It was then placed in an ethanol bath to degrease it, and then soaked in a 3% solution of Benzotriazole (a corrosion inhibitor) in 50:50 v/v ethanol and water. It was dried in a vacuum and then coated with two coats of Inctalac.⁷

Analysis of the Metal

Analysis of the manufacturing technique and elemental composition was carried out in an attempt to answer the following questions:

1. What is the composition of the metal?
2. Was the mouthpiece cast, or manufactured from sheet metal?
3. Were the bowl and rim made in one piece or manufactured separately?
4. Is there any evidence that the darker section at the bottom of the bowl represents remnants of solder material, indicating that a lost shank was attached to this area?

7. E. Jordan, unpublished conservation report (1994), on file with the Jamestown Rediscovery Project, Rediscovery Center, Historic Jamestowne (Preservation Virginia).

The first step was to examine and record the surface of the object using a Hirox 3-D digital microscope. This examination revealed no evidence that the bowl and rim were made separately and then joined; instead, the evidence pointed to a single cast piece. The examination also showed that the surface of the mouthpiece is heavily pitted and uneven. Shallow grooves are visible on the rim, with deeper ones on the exterior and interior of the cup (fig. 7). These striations appear to be the result of the cleaning rather than the manufacturing process.

Examination under the microscope also revealed an area on the exterior of the rim that may possibly show the remains of a maker's mark (fig. 8). "It appears to consist of a small design area with a rectangular area beneath that may have contained some initials beginning with the letter 'V'. The area is heavily worn and it is difficult to make out all the details even under high magnification."⁸ The authors believe that the putative letter "V" may be followed by an "N," and further, that the letter above the rectangular area could be an "F," possibly standing for *fecit* ("made by").

To determine the composition of the metal, the researchers at Williamsburg examined the side of the bowl, the rim, and the dark-colored base area with a Hitachi S570 Scanning Electron Microscope with attached Energy Dispersive X-Ray Spectrometry (EDS/EDX) detector (fig. 9). Further analysis was carried out with a Bruker Tracer-III portable X-ray fluorescence device, analyzing surface areas only; no cross-sections were taken. The results appear in Appendix 1.

The Rim. Analysis of four points along the rim suggests that the mouthpiece was cast from brass consisting of copper and zinc; aluminum, silica, and iron are also present, but no tin. The aluminum is likely a residue of the conservation and cleaning treatment mentioned above, as it involved abrasion with aluminum oxide, while the iron and silica may be residues from the burial environment. Many objects found in the tidewater area of Virginia are made of iron, and their corrosion products can contaminate other materials found in close proximity. Silica is a common element in most soils. The chlorine found in one of the analyzed samples is likely a contaminant of the burial environment as well.

The Side. Two points were analyzed on the side of the bowl. At both, the metal was brass, with an approximate weight-percent ratio of 4:1, copper

8. Emily Williams, John Watson, and Olga Trofimova, "Metal Analysis Report," Colonial Williamsburg Foundation.

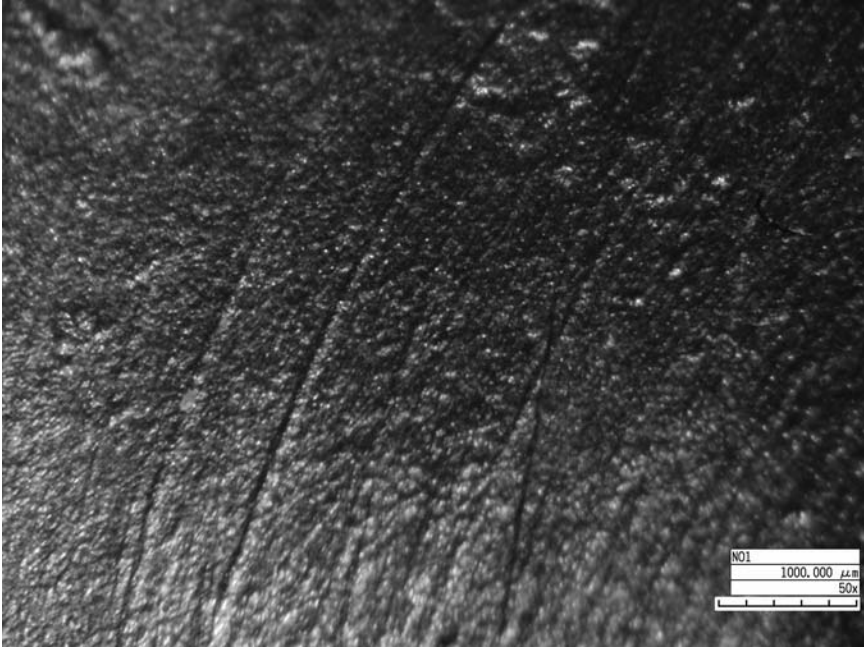


FIGURE 7. Striation and pitting on the inside of the bowl at 50x magnification. Photo courtesy of Jefferson Laboratory, Colonial Williamsburg Foundation.

to zinc, roughly the same proportion as in the rim. Trace amounts of aluminum, silica, and lead are also present.

The Stepped Base. Five points were analyzed at the base of the mouthpiece where the shank would have been attached and where remnants of solder material were suspected (see figs. 2 and 3). The analysis indicated that both tin and lead are present. The ratios of tin to lead suggest the use of a high-tin solder. In addition, the elements calcium and phosphorus are found in this area but not elsewhere on the mouthpiece, suggesting that they may have been associated with the process of soldering, possibly as part of the flux.

In their report, Williams, Watson, and Trofimova stress that Energy Dispersive X-Ray Spectrometry, the method used for the analysis of this mouthpiece, is a technique with surface penetration in the region of micrometers (thousandths of a millimeter) only. Consequently, surface activities such as contamination, corrosion, and cleaning may affect the

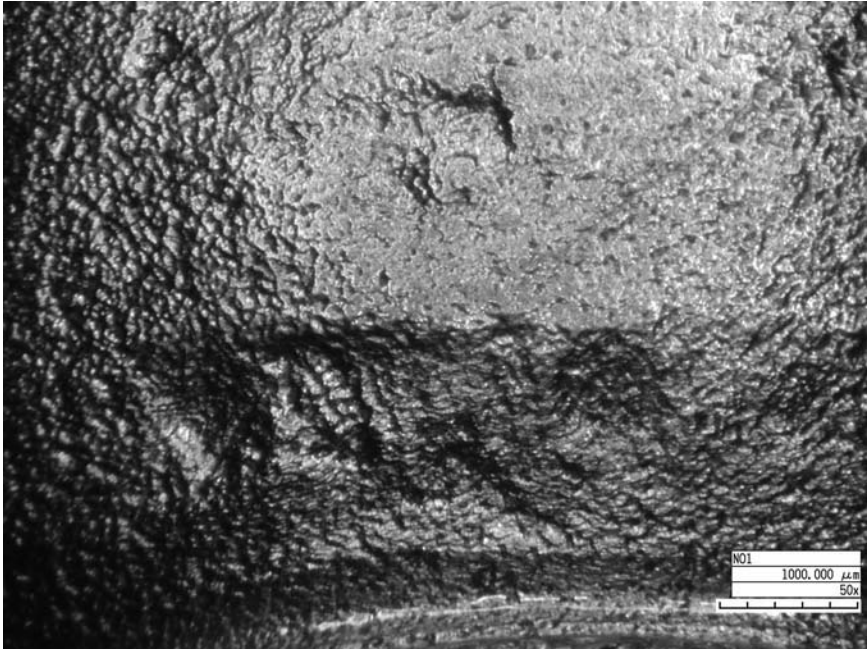


FIGURE 8. Possible maker's mark on the rim exterior of the mouthpiece. Photo courtesy of Jefferson Laboratory, Colonial Williamsburg Foundation.

quality of the results. Unfortunately, on an excavation site all these factors are present. The team thus concludes: "It must therefore be remembered that the results obtained do not necessarily represent the exact mixture or alloy that was used to create the artifact." While it is unlikely that a trace element that was present in the original condition has disappeared, it is possible that its ratio in relation to other elements has changed as a result of any or all the above-mentioned factors.

Historical Context of the Mouthpiece

Despite the caveats mentioned above, analysis of the metal provides crucial clues as to the manufacturing process and original design of the Jamestown mouthpiece and helps to establish its place in the history of brass instruments. The surviving portion of the mouthpiece is clearly a single piece of cast brass, and the shank was presumably soldered to the

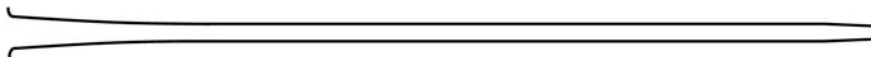


FIGURE 9. The mouthpiece in the Scanning Electron Microscope at Jefferson Laboratory. Photo by John Watson, Colonial Williamsburg Foundation.

stepped bottom of the bowl; the latter was therefore easily broken off. Unfortunately, examination of scrap pieces found in the vicinity of the mouthpiece did not reveal any possible candidate for the lost shank.

In the sixteenth and seventeenth centuries, two brasswind mouthpiece types can be distinguished that differ considerably from modern designs: those made entirely from sheet metal and those with cast cup and sheet-metal shank. Both of these types lack the so-called “backbore” of the modern mouthpiece, a smooth tapering that follows the throat or central hole. Composite mouthpieces made of layers of sheet metal are the oldest form. The so-called Billingsgate trumpet, a straight trumpet from the late fourteenth century that was excavated from the Thames foreshore, has a mouthpiece of this type (fig. 10), and trumpet mouthpieces made in 1442 by Marcian Guitbert of Limoges⁹ and in 1578 by the municipal trumpeter Jacob Steiger of Basel are of similar construction

9. Pierre-Yves Madeuf, Jean-François Madeuf, and Graham Nicholson, “The Guitbert Trumpet: A Remarkable Discovery,” *Historic Brass Society Journal* 11 (1999): 181–86.



10a. Drawing of the tube segment.



10b. The tube segment.



10c. The rim.

FIGURES 10a–c. The first tube segment of the “Billingsgate trumpet,” ending in a funnel; this is the instrument’s integral mouthpiece. A collar soldered to the end of the tube is formed into a rounded rim, joined by a seam. Museum of London, BWB83[335]<225>. Photo and drawing by Sabine K. Klaus, published by permission of the Museum of London.

(fig. 11).¹⁰ As no other exemplars of this type are known to survive, the design may have disappeared by the end of the sixteenth century.

The combination of a cast bowl with a cylindrical sheet-metal shank, tapering very slightly at the distal end to fit into the instrument, is confirmed in a trumpet by Anton Schnitzer, made in Nuremberg in 1581 (figs. 12a–c).¹¹ This design is particularly well documented in English trumpet mouthpieces of the seventeenth century,¹² but also appears regularly on mouthpieces from the European continent.

Analysis of the metal has established unambiguously that the Jamestown mouthpiece belongs to the second type described above, as it consists of a cast bowl that is preserved and a lost sheet-metal shank. Such mouthpieces typically have a ferrule covering the joint between bowl and shank. The Jamestown mouthpiece probably had such a ferrule as well, but no trace of it survives.

Where was the Mouthpiece Made?

The authors hoped that analysis of the metal in the mouthpiece bowl would help identify the region where the mouthpiece was made. Comparisons with the few early mouthpieces for which metal analysis exists, both from England and from Nuremberg—the two most likely regions of origin for the Jamestown mouthpiece—show no significant difference in the metal composition of the cast sections (see Appendix 2). For example, there is no significant difference between the metal composition of the cast bowl of this mouthpiece and of the one associated with a trumpet by Simon Beale,¹³ made in London in 1667, nor of the one that survives with a trumpet by the Nuremberg maker Conrad Droschel from 1618.¹⁴ The sheet-metal shank of the Beale trumpet mouthpiece, on the other hand, has a much higher copper content than sheet brass used in Nuremberg in the same period—for example, in an alto trombone by Michael Nagel (1663; London, Horniman Museum,

10. Historisches Museum Basel, 1880.206. Martin Kirnbauer, *Die Basler Standestrompeten von 1578* (Basel: Historisches Museum Basel, 2008), 27–28.

11. Vienna, Kunsthistorisches Museum, SAM 248.

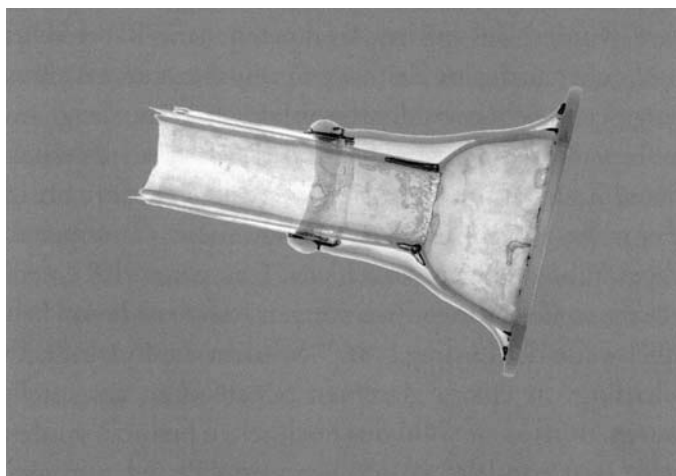
12. Eric Halfpenny, “Early British Trumpet Mouthpieces,” *Galpin Society Journal* 20 (1967): 76–88.

13. Bate Collection, University of Oxford, no. 78.

14. See Jeremy N. Green, *The Loss of the Verenigde Oostindische Compagnie retourschip Batavia, Western Australia 1629: An Excavation Report and Catalogue of Artefacts*, BAR International Series, no. 489 (Oxford: B.A.R., 1989), 74.



11a. Trumpet mouthpiece. Photo by Peter Portner, Historisches Museum Basel.



11b. Neutron imaging of the trumpet mouthpiece, showing the seven different sheet-metal layers. Photo by Paul Scherrer Institut, Villingen.

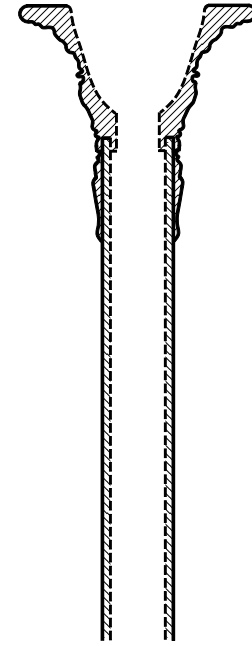
FIGURE 11. Trumpet mouthpiece by Jacob Steiger, Basel, 1578. Basel, Historisches Museum, 1880.206. Photos from Martin Kirnbauer, *Die Basler Standestrompeten von 1578* (Basel: Historisches Museum Basel, 2008), 28–29.



12a. Mouthpiece.



12b. X-ray of the mouthpiece.
Photo by Prof. Dr. Manfred
Schreiner, Institute of Science and
Technology, Academy of Fine Arts,
Vienna.



12c. Drawing of the internal profile.
Drawing by Sabine K. Klaus.

FIGURE 12. Mouthpiece of trumpet by Anton Schnitzer, Nuremberg, 1581, with cast bowl, cylindrical sheet-metal shank, and ferrule. Vienna, Kunsthistorisches Museum, SAM 248. Photo courtesy of the Sammlung alter Musikinstrumente, Kunsthistorisches Museum, Vienna.

14.5.47/228) and a trumpet bell by Paul Hainlein (1664; Trumpet Museum Bad Säckingen, 11201). Extensive metal analysis of brass instruments undertaken by Louise Bacon has shown that English trumpets built in the second half of the seventeenth century typically were made from sheet metal with a very high copper content, consisting of either a binary alloy (copper and tin = bronze), or a ternary alloy with copper as the main component and tin and zinc as the next major elements.¹⁵ Trumpets and trombones from Nuremberg, on the other hand, were made of sheet brass with fairly high zinc content—at least 20% and up to more than 30%—at least by the 1660s and possibly earlier (see Appendix 2). Thus the answer to the question as to where the Jamestown mouthpiece was made should probably have come from the sheet metal that was used for the shank, rather than from the cast bowl. As the shank is now missing, this evidence is lost.¹⁶

It is therefore not possible at this time to determine whether this mouthpiece was made in England or in Nuremberg. Nuremberg wares, such as jetons (small metal disks, used primarily as counters), were excavated in great numbers from the mud of the River Thames in London, and also made their way to early overseas settlements.¹⁷ Nuremberg jetons and a brass thimble with a Nuremberg maker's mark have been found in Jamestown.¹⁸ On the other hand, the settlers came from England, and they began their journey in London, so the mouthpiece could have been manufactured in the British Isles.¹⁹

15. Alice Louise Bacon, "A Technical Study of the Alloy Composition of 'Brass' Wind Musical Instruments (1661–1867) Utilizing Non-Destructive X-Ray Fluorescence," 2 vols. (PhD diss., Institute of Archaeology, University College of London, University of London, 2003).

16. It is hoped that ongoing archaeological excavations of James Fort may reveal the missing shank.

17. M. B. Mitchiner, C. Mortimer, and A. M. Pollard, "Nuremberg and its Jetons, c. 1475 to 1888: Chemical Compositions of the Alloys," *Numismatic Chronicle* 147 (1987): 114–55, esp. 118.

18. Thomas Eser, "Unter Tage, unter Wasser: Nürnberger Artefakte als archäologische Funde," in *Quasi Centrum Europae: Europa kauft in Nürnberg, 1400–1800*, ed. Hermann Maué et al. (Nuremberg: Germanisches Nationalmuseum, 2002), 110–12.

19. At least three makers of cup-mouthpiece instruments—George Langdall, Simon Brewer, and John Kirby—were active in England during the closing decades of the sixteenth century and the first decade of the seventeenth, but no connection can be established between any of them and the Jamestown mouthpiece, nor do their initials match any of the conceivable interpretations of those possibly engraved on the object, as represented in figure 8. See Maurice Byrne, "The Goldsmith-Trumpet-Makers of the British Isles," *Galpin Society Journal* 19 (1966): 71–83.

A Mouthpiece for a Trumpet or a Trombone?

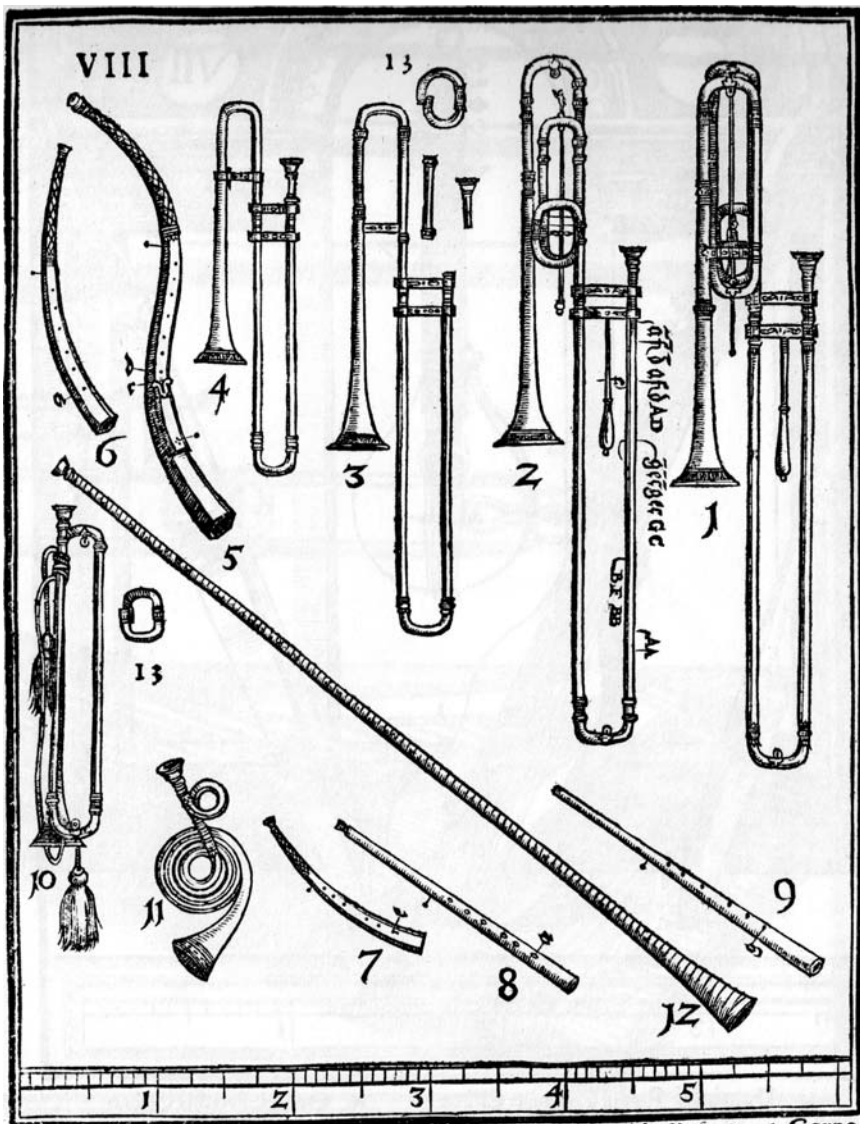
For what kind of instrument was the mouthpiece intended—a trumpet or a trombone? Circumstantial evidence outlined above would make it more likely that the mouthpiece belonged to a trumpet. While there are many references to trumpets in the writings of Captain Smith, trombones are not mentioned at all.

At first glance, the Jamestown mouthpiece appears to be rather large for a trumpet. The exterior diameter of the rim, however, compares well with that of surviving mouthpieces for both tenor trombones and trumpets from the sixteenth and seventeenth centuries (see Appendix 3)—an observation that is confirmed in the scale drawings in Michael Praetorius's *Theatrum Instrumentorum* (fig. 13, mouthpieces for nos. 3, 10, and 11).

Conclusion

The Jamestown mouthpiece is the earliest accessory for a brass instrument found in North America and dates from sometime before 1610. Its design, consisting of a cast bowl with a sheet-metal shank and possibly a ferrule, both now missing, was commonly found in Britain and on the European continent in the late sixteenth and early seventeenth centuries.

Several questions remain, however. Where was this mouthpiece made, and by whom? Possibly the craftsman responsible for it was an unidentified maker whose name is represented by the initial "V." If the correct reading of the following letter is "N," a provenance in Nuremberg would be plausible, but there is no trumpet maker recorded whose first or last name begins with the letter "V." Circumstantial evidence suggests that the mouthpiece originally belonged to a signal trumpet, but association with a trombone cannot be ruled out entirely.



1. 2. Quart-Posaunen. 3. Rechte gemeine Posaun. 4. Alt-Posaun. 5. Cornet / Groß Tenor-Cornet. 6. Rechte ChorZincl. 7. Klein DiscantZincl / so ein Quint höher. 8. Gerader Zincl mit ein Mundstück. 9. StillZincl. 10. Trommet. 11. Jäger Trommet. 12. Holzern Trommet. 13. Krummbügel auff ein ganz Thon.

FIGURE 13. Michael Praetorius, *Theatrum Instrumentorum* (Wolfenbüttel, 1620), plate VIII. The mouthpieces of the trumpet (no. 10), *Jägertrompete* (no. 11), and tenor trombone (no. 3) are identical in size.

APPENDIX 1:

Metal Analysis of the Jamestown Mouthpiece Fragment (171-JR, recovered from layer 2G of Pit 1)

The analysis was carried out by Emily Williams, John Watson, and Olga Trofimova, at Jefferson Laboratory, Colonial Williamsburg Foundation, on February 19 and 20, 2008.

THE RIM:

Sample 1:



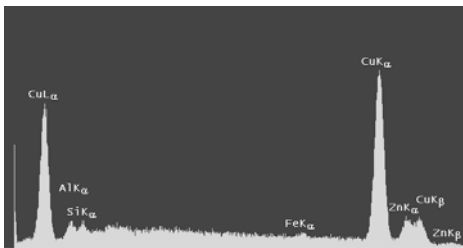
Quantitative Analysis Results - Standardless Analysis :
Spectrum2 -115nm Nb (15KV, 80uA, 100X, 120s) Tue, Feb 19 2008
EDS Parameters - 15KV, Takeoff Angle: 21.2°, Fit Index: 410.88
Correction: ZAF, Cycles: 2

Element	Line	Kratio	Error	ZAF Weight	Error	Ovolt
O	Ka:EDS	0.1553	0.0060*	0.3844	<0.0120	0.0060
Si	Ka:EDS	0.0215	0.0022	0.4928	0.0429	0.0050
Cu	Ka:EDS	1.1313	0.0270	0.9906	0.9571	0.0272
Zn	Ka:EDS	0.0029	0.0157*	0.9915	<0.0314	0.0157

* =< 2 Sigma

Element	Atom%	Compound	Weight%	Error (s)	Norm%
Si	9.20	Si	4.29	0.22	4.29
Cu	90.80	Cu	95.71	2.70	95.71
<Total>	100.00		100.00		100.00

Sample 2:

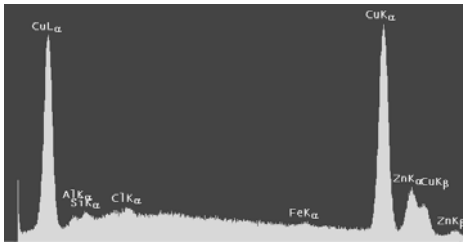


Quantitative Analysis Results - Standardless Analysis :
Spectrum1 -115nm Nb (15KV, 80uA, 100X, 120s) Tue, Feb 19 2008
EDS Parameters - 15KV, Takeoff Angle: 21.2°, Fit Index: 6.74
Correction: ZAF, Cycles: 3

Element	Line	Kratio	Error	ZAF Weight	Error	Ovolt
Al	Ka:EDS	0.0038	0.0003	0.2995	0.0190	0.0010
Si	Ka:EDS	0.0043	0.0003	0.4196	0.0100	0.0008
Fe	Ka:EDS	0.0111	0.0014	1.1574	0.0094	0.0012
Cu	Ka:EDS	0.8582	0.0078	0.9930	0.8403	0.0080
Zn	Ka:EDS	0.1235	0.0055	0.9942	0.1213	0.0055

Element	Atom%	Compound	Weight%	Error (s)	Norm%
Al	4.31	Al	1.90	0.03	1.90
Si	2.19	Si	1.00	0.03	1.00
Fe	1.03	Fe	0.54	0.14	0.54
Cu	81.09	Cu	84.03	0.79	84.03
Zn	11.38	Zn	12.13	0.55	12.13
<Total>	100.00		100.00		100.00

Sample 3:

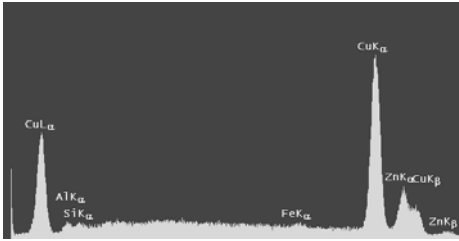


Quantitative Analysis Results - Standardless Analysis :
Spectrum1 -115nm Nb (15KV, 80uA, 100X, 120s) Tue, Feb 19 2008
EDS Parameters - 15KV, Takeoff Angle: 21.2°, Fit Index: 1.52
Correction: ZAF, Cycles: 3

Element	Line	Kratio	Error	ZAF Weight	Error	Ovolt
Al	Ka:EDS	0.0026	0.0002	0.2954	0.0088	0.0006
Si	Ka:EDS	0.0028	0.0002	0.4179	0.0088	0.0005
Cl	Ka:EDS	0.0035	0.0003	0.7478	0.0046	0.0004
Fe	Ka:EDS	0.0056	0.0008	1.1574	0.0047	0.0007
Cu	Ka:EDS	0.7924	0.0047	0.9955	0.7849	0.0048
Zn	Ka:EDS	0.1932	0.0038	0.9967	0.1911	0.0038

Element	Atom%	Compound	Weight%	Error (s)	Norm%
Al	2.03	Al	0.88	0.02	0.88
Si	1.30	Si	0.58	0.02	0.58
Cl	0.81	Cl	0.46	0.03	0.46
Fe	0.53	Fe	0.47	0.08	0.47
Cu	77.09	Cu	78.49	0.47	78.49
Zn	18.25	Zn	19.11	0.38	19.11
<Total>	100.00		100.00		100.00

Sample 4:



Quantitative Analysis Results - Standardless Analysis :
Spectrum1 -115nm Nb (15KV, 80uA, 100X, 120s) Tue, Feb 19 2008
EDS Parameters - 15KV, Takeoff Angle: 21.2°, Fit Index: 5.96
Correction: ZAF, Cycles: 3

Element	Line	Kratio	Error	ZAF	Weight	Error	Ovolt
Al	Ka:EDS	0.0030	0.0002	0.2940	0.0100	0.0006	9.61
Si	Ka:EDS	0.0018	0.0002	0.4157	0.0048	0.0004	9.15
Fe	Ka:EDS	0.0067	0.0010	1.1576	0.0057	0.0009	2.11
Cu	Ka:EDS	0.7720	0.0058	0.9961	0.7655	0.0058	1.67
Zn	Ka:EDS	0.2165	0.0047	0.9974	0.2144	0.0047	1.55

Element	Atom%	Compound	Weight%	Error (z)	Norm%
Al	2.93	Al	1.00	0.02	1.00
Si	0.96	Si	0.43	0.02	0.42
Fe	0.64	Fe	0.57	0.10	0.57
Cu	75.51	Cu	76.55	0.58	76.55
Zn	20.56	Zn	21.44	0.47	21.44
<Total>		100.00	100.00		100.00

THE SIDE:

Sample 1:



Quantitative Analysis Results - Standardless Analysis :
Spectrum1 -115nm Nb (15KV, 80uA, 100X, 120s) Tue, Feb 19 2008
EDS Parameters - 15KV, Takeoff Angle: 21.2°, Fit Index: 6.89
Correction: ZAF, Cycles: 3

Element	Line	Kratio	Error	ZAF	Weight	Error	Ovolt
Al	Ka:EDS	0.0096	0.0002	0.2992	0.0311	0.0008	9.61
Si	Ka:EDS	0.0018	0.0002	0.4151	0.0048	0.0004	8.15
Cu	Ka:EDS	0.8207	0.0054	0.9930	0.8009	0.0054	1.67
Zn	Ka:EDS	0.1678	0.0041	0.9940	0.1638	0.0041	1.55

Element	Atom%	Compound	Weight%	Error (z)	Norm%
Al	7.02	Al	3.11	0.02	3.11
Si	0.93	Si	0.43	0.02	0.43
Cu	76.79	Cu	80.09	0.54	80.09
Zn	15.26	Zn	16.38	0.41	16.38
<Total>		100.00	100.00		100.00

Sample 2:



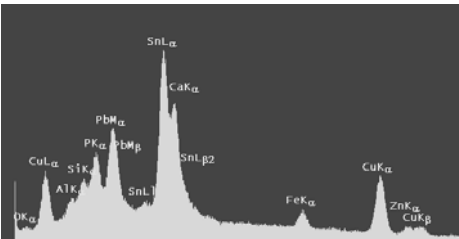
Quantitative Analysis Results - Standardless Analysis :
Spectrum1 -115nm Nb (15KV, 80uA, 100X, 120s) Tue, Feb 19 2008
EDS Parameters - 15KV, Takeoff Angle: 21.2°, Fit Index: 4.33
Correction: ZAF, Cycles: 3

Element	Line	Kratio	Error	ZAF	Weight	Error	Ovolt
Al	Ka:EDS	0.0092	0.0003	0.2919	0.0297	0.0011	9.61
Cu	Ka:EDS	0.8227	0.0067	0.9905	0.8012	0.0067	1.67
Zn	Ka:EDS	0.1556	0.0049	1.0000	0.1513	0.0049	1.55
Pb	Ma:EDS	0.0124	0.0015	0.6801	0.0178	0.0022	6.01

Element	Atom%	Compound	Weight%	Error (z)	Norm%
Al	6.04	Al	2.97	0.03	2.97
Cu	78.26	Cu	80.12	0.67	80.12
Zn	14.37	Zn	15.13	0.49	15.13
Pb	0.53	Pb	1.78	0.15	1.78
<Total>		100.00	100.00		100.00

THE STEPPED BASE:

Sample 1:

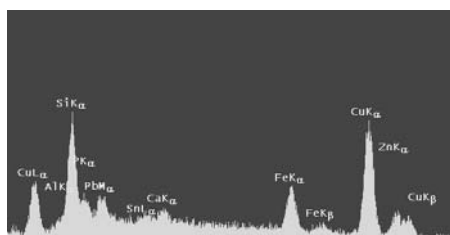


Quantitative Analysis Results - Standardless Analysis :
Spectrum1 -115nm Nb (15KV, 80uA, 100X, 120s) Tue, Feb 19 2008
EDS Parameters - 15KV, Takeoff Angle: 21.2°, Fit Index: 17.33
Correction: ZAF, Cycles: 4

Element	Line	Kratio	Error	ZAF	Weight	Error	Ovolt
O	Ka:EDS	0.0251	0.0001	0.1943	0.1039	0.0057	29.42
Al	Ka:EDS	0.0081	0.0003	0.2953	0.0086	0.0006	9.61
Si	Ka:EDS	0.0080	0.0004	0.5725	0.0140	0.0006	0.15
P	Ka:EDS	0.0264	0.0004	0.6747	0.0321	0.0007	6.99
Ca	Ka:EDS	0.0525	0.0010	0.9836	0.0447	0.0010	3.72
Fe	Ka:EDS	0.0412	0.0013	1.0144	0.0334	0.0012	2.11
Cu	Ka:EDS	0.3345	0.0016	1.0571	0.2548	0.0016	1.67
Zn	Ka:EDS	0.0439	0.0010	1.0180	0.0354	0.0019	1.55
Sn	La:EDS	0.3280	0.0028	0.8455	0.3139	0.0033	3.81
Pb	Ma:EDS	0.1515	0.0018	0.7945	0.1554	0.0023	6.01

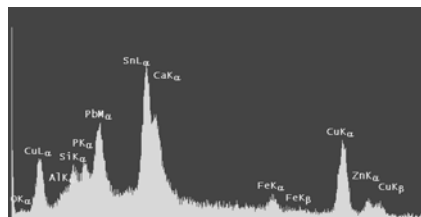
Element	Atoms%	Compound	Weight%	Error (±)	Norm%
O	35.87	O	10.39	0.11	10.39
Al	2.14	Al	1.05	0.03	1.05
Si	2.76	Si	1.40	0.04	1.40
P	5.73	P	3.21	0.04	3.21
Ca	6.16	Ca	4.47	0.10	4.47
Fe	3.30	Fe	3.34	0.13	3.34
Cu	22.31	Cu	25.68	0.36	25.68
Zn	2.99	Zn	3.54	0.30	3.54
Sn	14.60	Sn	31.39	0.28	31.39
Pb	4.14	Pb	15.54	0.18	15.54
<Total>	100.00		100.00		100.00

Sample 2:



Element	Line	Kratio	Error	ZAF	Weight	Error	Ovolt
Al	Ka:EDS	0.0037	0.0006	0.3416	0.0099	0.0017	9.61
Si	Ka:EDS	0.0401	0.0009	0.4732	0.0919	0.0019	8.15
P	Ka:EDS	0.0122	0.0008	0.5426	0.0204	0.0015	6.99
Ca	Ka:EDS	0.0109	0.0012	0.9616	0.0103	0.0012	2.72
Fe	Ka:EDS	0.1088	0.0035	1.0768	0.0919	0.0033	2.11
Cu	Ka:EDS	0.6291	0.0105	0.9760	0.5839	0.0107	1.67
Zn	Ka:EDS	0.1436	0.0086	0.9796	0.1332	0.0087	1.55
Sn	Lα:EDS	0.0002	0.0030*	0.8205	<0.0060	0.0030	3.81
Pb	Ma:EDS	0.0439	0.0028	0.6792	0.0386	0.0041	6.01
* <= 2 Sigma							
Element	Atoms%	Compound	Weight%	Error (±)	Norm%		
Al	2.06	Al	0.99	0.06	0.99		
Si	18.48	Si	9.19	0.09	9.19		
P	3.72	P	2.04	0.08	2.04		
Ca	1.46	Ca	1.03	0.12	1.03		
Fe	9.29	Fe	9.19	0.35	9.19		
Cu	51.89	Cu	58.39	1.05	58.39		
Zn	11.51	Zn	13.32	0.86	13.32		
Pb	1.60	Pb	5.86	0.28	5.86		
<Total>	100.00		100.00		100.00		

Sample 3:

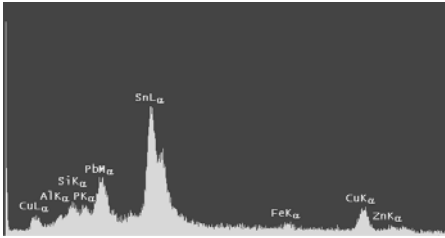


Quantitative Analysis Results - Standardless Analysis :
 Spectrum -115um Nb (15KV, 80uA, 100X, 120s) Tue, Feb 19 2008
 EDS Parameters - 15KV, Takeoff Angle: 21.2°, Fit Index: 50.83
 Correction: ZAF, Cycles: 5

Element	Line	Kratio	Error	ZAF	Weight	Error	Ovolt
O	Ka:EDS	0.0434	0.0024	0.2220	0.1501	0.0109	29.42
Al	Ka:EDS	0.0035	0.0006	0.4315	0.0066	0.0013	9.61
Si	Ka:EDS	0.0107	0.0007	0.5418	0.0157	0.0013	8.15
P	Ka:EDS	0.0120	0.0009	0.6433	0.0159	0.0013	6.99
Ca	Ka:EDS	0.0361	0.0020	0.9744	0.0296	0.0021	3.72
Fe	Ka:EDS	0.0267	0.0025	1.0093	0.0211	0.0025	2.11
Cu	Ka:EDS	0.4005	0.0085	0.9825	0.3247	0.0087	1.67
Zn	Ka:EDS	0.0916	0.0071	0.9900	0.0730	0.0072	1.55
Sn	Lα:EDS	0.2539	0.0055	0.8578	0.2388	0.0066	3.81
Pb	Ma:EDS	0.1209	0.0037	0.7731	0.1238	0.0047	6.01

Element	Atoms%	Compound	Weight%	Error (±)	Norm%
O	45.41	O	15.01	0.24	15.01
Al	1.18	Al	0.66	0.06	0.66
Si	2.71	Si	1.57	0.07	1.57
P	2.48	P	1.59	0.09	1.59
Ca	3.57	Ca	2.96	0.20	2.96
Fe	1.83	Fe	2.11	0.25	2.11
Cu	24.73	Cu	32.47	0.85	32.47
Zn	5.47	Zn	7.38	0.71	7.38
Sn	9.74	Sn	23.88	0.55	23.88
Pb	2.89	Pb	12.38	0.37	12.38
<Total>	100.00		100.00		100.00

Sample 4:

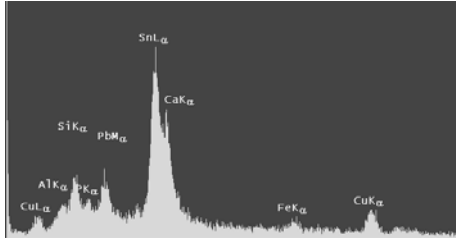


Quantitative Analysis Results - Standardless Analysis :
Spectrum1 -15kV.Mn (15KV, 80uA, 100Z, 120s) Thu, Feb 19 2008
EDS Parameters - 15KV, Takeoff Angle: 21.2°, Fit Index: 46.53
Correction: ZAF, Cycles: 4

Element	Line	Kratio	Error	ZAF	Weight	Error	Ovrlt
Al	Ka:EDS	0.0054	0.0010	0.5019	0.0099	0.0019	9.61
Si	Ka:EDS	0.0140	0.0012	0.5748	0.0223	0.0021	8.15
F	Ka:EDS	0.0133	0.0013	0.6782	0.0180	0.0020	6.99
Fe	Ka:EDS	0.0261	0.0039	1.0640	0.0225	0.0037	2.11
Cu	Ka:EDS	0.2583	0.0115	1.0861	0.2185	0.0106	1.67
Zn	Ka:EDS	0.0496	0.0108	1.1041	0.0414	0.0098	1.55
Sn	La:EDS	0.4767	0.0103	0.0785	0.4923	0.0117	3.81
Pb	Ma:EDS	0.1564	0.0061	0.8159	0.1752	0.0075	6.01

Element	Atom%	Compound	Weight%	Error (z)	Norm%
Al	3.28	Al	0.99	0.10	0.99
Si	7.07	Si	2.23	0.12	2.23
F	5.18	F	1.80	0.13	1.80
Fe	3.59	Fe	2.25	0.39	2.25
Cu	30.68	Cu	21.85	1.15	21.85
Zn	5.65	Zn	4.14	1.00	4.14
Sn	37.01	Sn	49.23	1.03	49.23
Pb	7.54	Pb	17.52	0.61	17.52
<Total>	100.00		100.00		100.00

Sample 5:



Element	Line	Kratio	Error	ZAF	Weight	Error	Ovrlt
Al	Ka:EDS	0.0124	0.0012	0.5461	0.0205	0.0022	9.61
Si	Ka:EDS	0.0300	0.0015	0.5882	0.0462	0.0016	8.15
F	Ka:EDS	0.0143	0.0015	0.6841	0.0189	0.0023	6.99
Ca	Ka:EDS	0.0741	0.0047	1.0349	0.0647	0.0045	3.72
Fe	Ka:EDS	0.0348	0.0048	1.0300	0.0306	0.0046	2.11
Cu	Ka:EDS	0.1946	0.0119	1.0527	0.1672	0.0113	1.67
Sn	La:EDS	0.5265	0.0127	0.8895	0.5279	0.0143	3.81
Pb	Ma:EDS	0.1133	0.0063	0.9165	0.1250	0.0077	6.01

Element	Atom%	Compound	Weight%	Error (z)	Norm%
Al	5.93	Al	2.05	0.12	2.05
Si	12.55	Si	4.52	0.16	4.52
F	4.76	F	1.69	0.15	1.69
Ca	12.59	Ca	6.47	0.47	6.47
Fe	4.27	Fe	3.06	0.48	3.06
Cu	20.52	Cu	16.72	1.19	16.72
Sn	34.68	Sn	52.79	1.27	52.79
Pb	4.71	Pb	12.50	0.63	12.50
<Total>	100.00		100.00		100.00

APPENDIX 2:

A Comparison of Metal Components in Seventeenth-Century Brass Instruments and Mouthpieces from England and Nuremberg, by Percentage

MOUTHPIECES											
Mouthpiece or part	Cu	Zn	Pb	Sn	Fe	Ag	Ni	As	Sb	Co	Reference
Droschel trumpet, Nuremberg 1618, mpc I	75.6	21.3	?	0.3	0.2	?	0.2	?	?	?	Hachenberg, Stanbury
Droschel trumpet, Nuremberg 1618, mpc II	76.5	19.2	?	2.3	1.2	?	0.4	?	?	?	Hachenberg, Stanbury
Simon Beale, London 1667, cast part	76.25	21.21	0.41	1.31	0.78	0.00	0.00	0.00	0.00	0.03	Bacon
Simon Beale, London 1667, shank	90.25	5.24	traces	3.11	0.10	0.37	0.00	1.00	0.00	0.00	Bacon
Billingsgate trumpet, mouthpiece section	86.00	8.00	0.10	6.00	0.00	0.00	0.00	0.00	0.00	0.00	Bacon
TRUMPETS, TROMBONES, AND SHEET BRASS SEGMENTS											
Instrument	Cu	Zn	Pb	Sn	Fe	Ag	Ni	As	Sb	Co	Reference
Michael Nagel, Nuremberg 1663, trombone	74.3	25.2	0.42	0	?	?	?	?	0.08	?	Hachenberg
Paul Hainlein, Nuremberg 1664, trumpet bell	77	22	0.17	<0.2	0.19	0.16	0.32	0.1	0.03	?	Hachenberg
J. W. Haas, Nuremberg 1682, horn ferrule	75.1	23.4	0.71	<0.25	0.21	0.08	0.37	<0.05	0.05	?	Hachenberg
J. W. Haas, Nuremberg 1680, trumpet	66.4	32.8	0.28	0	0.07	?	0.18	0.19	0.05	?	Hachenberg
J. C. Kodisch, Nuremberg 1694, trumpet	68.5	29.4	1.72	0.04	0.27	?	0.05	0	0.06	?	Hachenberg
Augustine Dudley, London 1651, trumpet (second yard)	88.23	4.63	0.80	3.44	0.25	0.70	0.20	1.00	0.00	traces	Bacon
Augustine Dudley, London 1665, trumpet (first yard)	88.06	6.28	0.96	3.99	0.35	0.20	0.02	0.00	0.14	0.00	Bacon
Augustine Dudley, London 1666, trumpet (bell)	86.48	4.08	0.25	8.75	0.39	traces	0.30	0.25	0.00	0.05	Bacon
Simon Beale, London 1667, trumpet (first bow)	89.89	4.14	0.00	2.96	0.14	2.44	0.00	0.41	0.00	0.02	Bacon

References

- Bacon, Alice Louise. "A Technical Study of the Alloy Composition of 'Brass' Wind Musical Instruments (1661–1867) Utilizing Non-Destructive X-Ray Fluorescence." 2 vols. PhD diss., Institute of Archaeology, University College of London, University of London, 2003.
- Hachenberg, Karl F. "Nürnberger Musikinstrumente aus Messing—Chancen und Grenzen der Herkunftsbestimmung durch Metallanalyse." In *Anzeiger des Germanischen Nationalmuseums 2002*, edited by Hermann Maué and Christine Kupper, 201–23. Nuremberg: Germanisches Nationalmuseum, 2002.
- Stanbury, Myra. "Analysis of the Batavia Wreck Mouthpieces" (in preparation).

APPENDIX 3:

Comparison of Sixteenth- and Seventeenth-Century Trumpet and Trombone Mouthpieces

TRUMPET MOUTHPIECES								
Date	Instrument type	Maker	Type of mouthpiece	External diameter cup	Internal diameter cup	Cup depth	Throat diameter	Location
Late 14th century	trumpet, straight	unknown	sheet metal	29.5	21.5	funnel-shaped	ca. 11	Museum of London
1442	trumpet	Marcian Guitbert	sheet metal	34.7	19.7	15.8	5.5	Private ownership, France
1578	trumpet	Jacob Steiger	sheet metal	37.6	23.5	16.4	8.5	Basel, HMB
1581	trumpet	Anton Schnitzer	cast bowl, separate shank	39	23	17	7	Vienna, KHM
1589	trumpet	?Lissandro Millanese	cast bowl, separate shank	38.5	22.6	18.6	7.8	Lelystad, Nationaal Scheepsarcheologisch Depot; Shipwreck Scheurrak S01
ca. 1589	trumpet	?	cast bowl, separate shank, lead	35.5	21	11.5–13	ca. 5	Shipwreck Scheurrak S01
ca. 1589	trumpet	?	cast bowl, separate shank, tin	35.5	21	11.5–13	ca. 5	Shipwreck Scheurrak S01
16th century	trumpet	unknown	cast bowl, separate shank	33.9	21.5	20.9	7.6	Copenhagen, x-64-1
before 1610	trumpet	unknown	cast bowl, shank lost	33.5	23.5	18	9.8/8.7	Historic Jamestowne
before 1629	trumpet	unknown	cast bowl, shank lost	30	20	?		Fremantle, W. Australia; Shipwreck Batavia
before 1629	trumpet	unknown	cast bowl, shank lost	33	20	?	7	Shipwreck Batavia
before 1629	trumpet	unknown	cast bowl, shank lost	33	21	?	7	Shipwreck Batavia

1666	trumpet	Augustine Dudley	with backbore	21.1	17.5	9.5	4.5	Museum of London
1666	trumpet	unknown	cast bowl, separate shank	35	20.5	14	7	Oxford, Queen's College
1667	trumpet	Simon Beale	cast bowl, separate shank	33.5	20	13	6.1	Oxford, Bate Coll
1669	trumpet	Thomas McCuir	cast bowl, separate shank	31.4	20.5	12.3	6	Edinburgh, Nat'l Museum of Scotland
ca. 1675	trumpet	Robert Brock	cast bowl, separate shank	31.4	20.5	11.8	6	Nat'l Museum of Scotland
ca. 1680	trumpet	William Bull	with backbore	32.3	20.4	8.5	4.8	Museum of London

TROMBONE MOUTHPIECES

Date	Instrument type	Maker	Type of mouthpiece	External diameter cup	Internal diameter cup	Cup depth	Throat diameter	Location
1579	trombone, tenor	Anton Schnitzer Sr.	cast bowl, separate shank	37	24.6	17.9	8	Verona, Accademia Filarmonica
1581	trombone, tenor	Anton Schnitzer Sr.	cast bowl, separate shank	30	22	17	7	Nice, Palais Lascaris
1593	trombone, bass	Pierre Colbert	cast bowl, separate shank	40.8	25		7.5	Amsterdam, Rijksmuseum
1616	trombone, bass	Isaac Ehe	cast bowl, separate shank	43	28	20	8	Munich, BNM
1650	trombone, bass	Wolf Birckholz	cast bowl, separate shank	36	23.4	14.7	7.4	Leipzig, Grassi Museum
1670	trombone, alto	Hieronimus Starck	cast with backbore	26.8	17.2	8.1	3.6	Nuremberg, GNM
1677	trombone, tenor	Paul Hainlein	cast with backbore	34.9	22.9	20	5	Nuremberg, GNM

APPENDIX 3: continued

Date	Instrument type	Maker	Type of mouthpiece	External diameter cup	Internal diameter cup	Cup depth	Throat diameter	Location
1695	trombone, alto	Wolf Birckholz	cast with backbore	33	21	12.5	6.3	Nuremberg, GNM
1698	trombone, alto	Johann Carl Kodisch	cast bowl, separate shank	29.8	18.7	8.6	4.2/3.3	Rosenheim, Städtisches Museum

References

- Halfpenny, Eric. "Early British Trumpet Mouthpieces." *Galpin Society Journal* 20 (March 1967): 76–88.
- Heide, Geert Jan van der. "The Reconstruction of a 16th-Century Italian Trumpet." *Historic Brass Society Journal* 8 (1996): 42–52.
- Madeuf, Pierre-Yves, Jean-François Madeuf, and Graham Nicholson. "The Guitbert Trumpet: A Remarkable Discovery." *Historic Brass Society Journal* 11 (1999): 181–86.
- Smith, David Hogan, *Trombone Technique in the Renaissance* (San Francisco: The King's Trumpets and Shawms, 1989).
- All other measurements provided by the museums or gathered by the authors.

Addison or Blunt: Who Made Canon Galpin's "Lyra Viol"?*

THOMAS G. MACCRACKEN

For three weeks during the summer of 1904, the Worshipful Company of Musicians celebrated the three hundredth anniversary of the granting of its royal charter by presenting a music loan exhibition at Fishmongers' Hall in London.¹ The numerous items on display included some 600 early printed music books and musical manuscripts, 200 letters and other documents, more than 500 portraits in various media, and about 500 musical instruments. The latter category encompassed wind, string, and keyboard instruments, nearly all of them on loan from private owners, most notably the collector and musical scholar Francis W. Galpin, who provided no fewer than 140 items, or more than a quarter of the total.²

Among the 119 bowed string instruments listed in the deluxe catalogue published five years after the event were twenty-six viols, including

*An earlier version of this article was presented as a paper at the 31st Annual Meeting of the American Musical Instrument Society, on June 21, 2002, at the Museum of Fine Arts, Boston. I am grateful to many people who have helped me in the course of my work on this topic, and especially to Michael Fleming, Benjamin Hebbert, and John Pringle for extensive correspondence and conversations about old English viols over a period of many years.

1. "The Worshipful Company of Musicians is one of the ancient Guilds of the City of London. . . . So far as is known, the first Royal Charter was granted by Edward IV to the Minstrels on 24th April 1469. . . . Ultimately, the Minstrels petitioned the Crown for a new Charter of Incorporation, which was granted by James I on 8th July 1604." T. L. Southgate, Preface to *English Music [1604 to 1904], Being the Lectures Given at the Music Loan Exhibition of the Worshipful Company of Musicians, Held at Fishmongers' Hall, London Bridge, June-July, 1904* (London: Walter Scott; New York: Charles Scribners' Sons, 1906), ix.

2. These statistics come from D. W. Krummel, "An Edwardian Gentlemen's Music Exhibition," *Notes*, 2nd ser., 32, no. 4 (June 1976): 711-18, which provides a good overview of the event. Krummel notes that the instrument exhibit "contained 488 entries"; however, some catalogue entries cover multiple instruments, such as Galpin's quartets of recorders and shawms. According to Southgate (*English Music [1604 to 1904]*, xii), "the primary idea of the Exhibition was to show the development of musical instruments, and the advance that has taken place in the art during the past three hundred years, especially in our own country."

seven from Galpin's collection.³ Six of these seven are now at the Museum of Fine Arts, Boston, where they form part of the large and diverse collection of musical instruments purchased from Galpin in 1916 and donated to the museum by the wealthy Boston industrialist William Lindsey in memory of his daughter, Leslie Lindsey Mason, who had drowned in the sinking of the ocean liner *Lusitania* on May 7, 1915.⁴ In addition to the instrument that is the main subject of the present essay (fig. 1), the group of six viols includes a *pardessus de viole* by Benoist Fleury, a large treble or small tenor attributed to Johann Joseph Elsler, a tenor by Jesper Gotfredsen, a bass attributed to Claude Pierray, and a cither viol or sultana by Thomas Perry and William Wilkinson.⁵

Following a standard format used for all such entries, the catalogue of the 1904 loan exhibition identified the fifth instrument in the section entitled "Viols, Violins, &c." as a "Lyra Viol, English, tenor, six strings. By William Addison. London. 1665."⁶ More than three decades later, in his comprehensive catalogue and study of the Boston museum's Mason Collection, Nicholas Bessaraboff provided a similar description but with several significant changes, calling the instrument a "Lyra viol. England, ca. 1665, attributed to Addison, London." Bessaraboff carefully noted that the instrument, as he knew it, had "no maker's label," which is most

3. See *An Illustrated Catalogue of the Music Loan Exhibition held . . . by the Worshipful Company of Musicians at Fishmongers' Hall, June and July, 1904* (London: Novello, 1909), 148–52. A further eight viols came from the firm of W. E. Hill & Sons, while the remaining eleven were loaned by ten different private owners.

4. The RMS *Lusitania*, owned and operated by the British Cunard Steamship Company, was torpedoed by a German submarine off the coast of Ireland and sank in less than twenty minutes with the loss of 1,200 lives, including 139 Americans. This incident caused considerable international tension, some two years prior to the entry of the United States into World War I.

5. Further information on each of these, including photographs, may be found on the museum's website, www.mfa.org. The seventh viol loaned by Galpin to the 1904 exhibition was a treble by Henry Jaye, dated 1632, whose current location is unknown; in 1951 it belonged to Leonard H. Lock, who made it available for an exhibition sponsored by the Galpin Society, an organization for the study of musical instruments that had been founded five years earlier and named in honor of the recently deceased Galpin; see *British Musical Instruments: An Exhibition, August 7–30, 1951* (London: The Galpin Society, 1951), no. 506. Also part of the Lindsey gift to the Museum of Fine Arts and currently documented on its website were three viols that Galpin did not exhibit in 1904: a bass by Barak Norman, a hybrid alto-sized instrument by Richard Duke II, and a *pardessus* by François Vaillan that had been transformed into a cither viol.

6. *An Illustrated Catalogue*, 148.

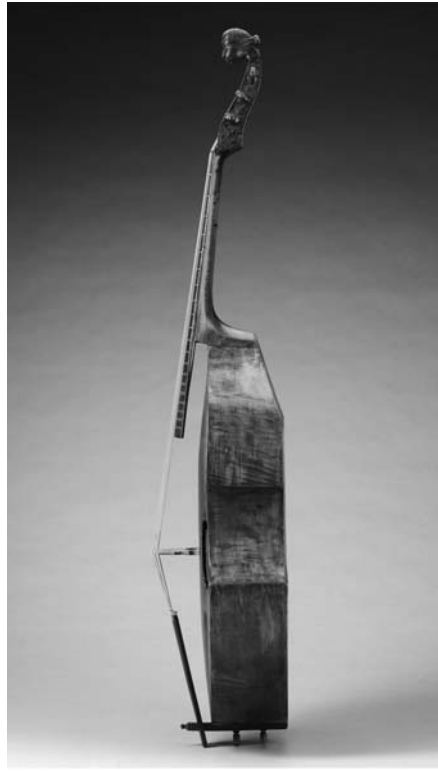


FIGURE 1. Tenor viol attributed to Richard Blunt: front, back, and side views. Museum of Fine Arts, Boston, Leslie Lindsey Mason Collection, 17.1718. Photographs © 2010, Museum of Fine Arts, Boston.

likely the reason he described it as “attributed to” (rather than “by”) Addison and qualified its date with the word *circa*.⁷

The absence of a label, at least by the late 1930s, naturally leads one to wonder what the basis was for Galpin’s claim that the viol was made by Addison, and moreover specifically in the year 1665. Fortunately, the answer to this question may be found in a notebook that the collector kept during the late 1880s, containing brief notes about the instruments he owned at that time.⁸ This document resurfaced some twenty-five years after Galpin’s death and was partially transcribed in an article published by his grandson. The entry for this viol includes the statement that “within is written in very faint ink: (W.) Addison fecit Londini 1665.”⁹

The elder Galpin did not specifically mention a label, as he carefully and consistently did in his notebook entries for other viols by Fleury,

7. Nicholas Bessaraboff, *Ancient European Musical Instruments: An Organological Study of the Musical Instruments in the Leslie Lindsey Mason Collection at the Museum of Fine Arts, Boston* (Cambridge, MA: Harvard University Press, 1941; repr., New York: October House, 1964), 276–77. A front view of the instrument is included in plate XI, at the end of the volume, as well as in Walter L. Woodfill, *Musicians in English Society from Elizabeth to Charles I* (Princeton: Princeton University Press, 1953; rev. ed. New York: Da Capo Press, 1969), facing p. 49. A different photo taken also from the front is included in plate VI of Galpin’s own *A Textbook of European Musical Instruments* (London: Williams & Norgate, 1937), which he acknowledges is reprinted from *Grove’s Dictionary of Music and Musicians*, 3rd ed. (London: Macmillan, 1927), appearing there in vol. 5, facing p. 514, to illustrate the article “Viol” by Edward J. Payne and Edward Heron-Allen.

8. Galpin pursued the study of musical instruments as a hobby (albeit one in which he achieved an international reputation), alongside his career as a priest of the Church of England. For fifty years after his ordination in 1883 he held a series of positions as curate, vicar, and rector of parish churches, mostly in the county of Essex, northeast of London; in 1917 he was in addition made a canon of Chelmsford Cathedral. See *The New Grove Dictionary of Music and Musicians*, 2nd ed. (London: Macmillan, 2001), s.v. “Galpin, Francis William,” by Rosemary Williamson. Because the latter appointment took effect the year after his collection was transferred to the Museum of Fine Arts, technically the title of the present article is anachronistic, since he was never known as Canon Galpin during the time he owned the instrument in question.

9. Brian Galpin, “Canon Galpin’s Check Lists,” *Galpin Society Journal* 25 (1972): 4–21, at 18. Immediately following these words, Canon Galpin wrote “cf. Sandys and Foster [*sic*], *The Violin* p. ,” without filling in a page number. The intended reference is to William Sandys and Simon Andrew Forster, *The History of the Violin, and Other Instruments Played On with the Bow from the Remotest Times to the Present: Also an Account of the Principal Makers, English and Foreign, with Numerous Illustrations* (London: William Reeves, 1864), 251, which quotes the label in a viol by “William Addison in Long Alley over against Moorfields 1670.” I assume that the inscription recorded by Galpin gave only the maker’s last name, and that Galpin provided his parenthetical first initial on the basis of this mention of Addison by Sandys and Forster.

Gotfredsen, Jaye, and Norman, so perhaps these words were instead written directly on the inside surface of the instrument's back. In that case, it is not difficult to imagine that such an already faint inscription would have failed to survive the fairly extensive restoration work performed on the instrument in the mid-1930s, which Bessaraboff describes in his catalogue entry.¹⁰ On the other hand, this would be an unusual way for the original maker to sign his work, which for string instruments—whether belonging to the violin or viol families—is normally done on a paper label glued inside the back rather than by writing directly on the wood, though the latter procedure is sometimes found as well.¹¹ And while it is somewhat more common to find the names of instrument repairers written on an interior wooden surface, the inscription Galpin saw was probably not meant to record repair work performed by Addison on an instrument made by someone else, because in that case one would expect him to have used a different verb than *fecit* ("he made"), such as *reparavit* ("he repaired").¹²

In any case, it is clear that Galpin believed this instrument had been made by Addison in 1665. In his notebook he further described it as "with original bridge, carved peg-box & female human head. Fretted

10. "Restored by Messrs. John A. Gould & Sons in 1936. *Note on restoration.* The back was warped, cracked, and the joints opened. The reinforced linen joint of back and the ribs was found inadequate for keeping the instrument in shape, so the regular [i.e., wooden] linings were glued to the ribs; old crossbars were replaced by newer and stronger ones." Bessaraboff, *Ancient European Musical Instruments*, 277. This account is confirmed by a repair label inside the viol, whose printed text reads "Restored by John A. Gould & Sons / Established 1889 / Violin Makers, Dealers and Repairers / Boston, Massachusetts"; a handwritten addendum on this label specifies that the work consisted of "two new cross bars; six / new linings, and crack / stays inserted. June 1936." It is conceivable that in the course of this restoration an original paper label could have been removed and not replaced, but given the careful description (both on the repair label and by Bessaraboff) of the work done it does not seem likely this would have happened but gone unmentioned.

11. For example, a bass viol by Richard Meares (privately owned in Switzerland) has on the inside of its back, above the fold, an inscription reading "Richard Meares / 1679" in a larger version of the same handwriting that appears on the maker's manuscript label. If the latter identification had been lost the former would still remain, in a manner not fundamentally different from the result of the hypothesis proposed above for the Addison viol.

12. A bass viol made by "Henry Jaye in Southwarke 1631" (privately owned in Germany) offers an example of the latter usage on a second label reading "Petrus Desplane . . . me reparavit 1707" (private communication from Klaus Martius, based on Kathrin Schulze's examination of the instrument while it was at the Germanisches Nationalmuseum, Nuremberg, in 1991).

fingerboard of later date. Reddish varnish & double purfling.”¹³ Half a century later, Bessaraboff provided the following more detailed physical description:

Flat back of maple, in two pieces with purfling. Ribs of maple. Belly of soft pine, slightly arched, with two C-holes. Neck of maple with peg-box and carved head of blind-folded woman at the top. Finger-board of maple, veneered with ebony; twenty German silver frets inserted in it. Hook-bar of maple, affixed to the bottom block by two turned pins with heads; tail-piece of maple veneered with ebony. Six strings with movable bridge. . . . Bass-bar and sound-post. Dark reddish-brown varnish. No maker’s label. . . . Body, length, 56.5 cm.; width, upper bouts, 26.75 cm.; middle bouts, 19 cm.; lower bouts, 32 cm. Ribs, height, 11 cm. Vibrating length of strings, 60 cm.¹⁴

Though neither writer says so, the female head has clearly been grafted onto the pegbox, meaning either that it was carved by a different craftsman at the time the viol was made, or more likely that it is a later replacement, despite Galpin’s statement that it was among the instrument’s original features. Considering that this head is rather small in proportion to both the pegbox and the body, and moreover that it wears a blindfold, it may have been transplanted from a viola d’amore.¹⁵ At some point in the instrument’s history, a bad break between the pegbox and the neck was crudely repaired by means of a curved metal plate held in place with thirteen screws, but there is no reason to think that these two components, in contrast to the carved head, have not always been attached to the body. On the other hand, as Galpin realized, the twenty metal frets inlaid into the fingerboard are surely a later addition, in marked contrast to the usual practice of tying seven gut frets around the neck.

In both the loan exhibition and Boston museum catalogues this instrument is classified as a *lyra viol*, a term that calls for explanation and clarification before turning to the primary question of the viol’s author-

13. Galpin, “Canon Galpin’s Check Lists,” 18.

14. Bessaraboff, *Ancient European Musical Instruments*, 276–77. Following his usual practice, Bessaraboff clearly rounded these measurements to the nearest quarter of a centimeter.

15. Although blindfolded heads, representing Cupid (the Roman god of love, also known as Amor, or Amore in Italian), were a common feature of violas d’amore, the only violas da gamba I know of with such heads are of treble size, with body lengths between 35 and 40 cm; all are of eighteenth-century German origin and most of them probably began life as violas d’amore of the type with five bowed and no sympathetic strings.

ship. In seventeenth-century England there were three basic sizes of viol, called treble, tenor, and bass. However, as John Playford explained in 1664,

There are three Sorts of *Basse-Viols*, as there is three manner of ways in playing.

First, A *Basse-Viol* for *Consort* must be one of the largest size, and the strings proportionable.

Secondly, a *Basse Viol* for *Divisions* must be of a lesse Size, and the strings according.

Thirdly, a *Bass Viol* to play *Lyra way* which is by *Tablature*, must be somewhat lesse then the two former, and strung proportionable.¹⁶

This information is confirmed and made more specific in the comprehensive and detailed notes on musical instruments compiled during the 1690s by James Talbot, Regius Professor of Hebrew at Cambridge University. He recorded a body length of 30 inches (about 76 cm) for a consort bass viol, and stated that "the Consort Viol is longer than the Division Viol 1 [inch] in the Neck and Body," while the "Lyra Viol bears the proportion to the Division Viol, viz. it is shorter in the Body and Neck 1 [inch]."¹⁷

As a practical matter, however, the term "lyra viol" denotes not so much a physically different instrument as it does a playing technique that can potentially be used on a viol of any size. The extensive seventeenth-century English repertoire for unaccompanied viol features both chordal writing and a wide array of alternate tunings meant to facilitate the playing of chords in various keys.¹⁸ Because this music was intended

16. John Playford, *A Brief Introduction to the Skill of Musick*, 4th ed. (London: Playford, 1664), microfilm, *Early English Books 1641–1700* (Ann Arbor: University Microfilms, 1966), reel 1511, item 1, p. 88. This passage was not present in earlier editions of Playford's treatise (dated 1654–62), but once added it was retained essentially unchanged (except for minor details of spelling, punctuation, and typography) all the way through the 19th (and last) edition of 1730.

17. Robert Donington, "James Talbot's Manuscript (Christ Church Library Music MS 1187), II. Bowed Strings," *Galpin Society Journal* 3 (1950): 27–45, at 31–33. In his manuscript Talbot used a (single) prime mark as an abbreviation for inch, together with a double prime mark signifying an eighth of an inch. The body length of 28 inches implied here for a lyra viol is explicitly confirmed in his list of its dimensions (*ibid.*, 34).

18. See *The New Grove Dictionary of Music and Musicians*, 2nd ed. (London: Macmillan, 2001), s.v. "Lyra viol," by Frank Traficante, who notes that "although an instrument called lyra viol did exist it was nothing more than a bass viol of small dimensions with some quite minor peculiarities of adjustment."

for solo performance, its tuning instructions specify the interval between adjacent strings rather than absolute pitches, which therefore can be adjusted higher or lower to suit the size of instrument chosen. For music written “lyra-way” a somewhat shorter vibrating string length can facilitate the fingering of chords, in exchange for which the concomitant loss of sonority on the lowest strings is considered only a minor disadvantage since the instrument is not being used to play a bass line.

The catalogue of the 1904 loan exhibition, presumably drawing on information provided by Galpin, provides an alternate classification for his lyra viol as a “tenor.”¹⁹ Based on its body length of about 56 cm (22 in.), this is entirely appropriate, since Talbot gave 23 inches as the “Length of Belly” for a tenor viol.²⁰ Galpin’s instrument is thus not even a full-sized tenor in Talbot’s terms, still less any kind of bass. Bessaraboff, on the other hand, chose not to call it a tenor viol, probably because it was larger than what twentieth-century players had by then come to think of as a tenor. As part of a lengthy general introduction to viols in his catalogue, he provides a chart of sizes in which the body length of a tenor is given as 48–52 cm, while the three sizes of bass are listed as 56–60 cm for lyra viol, 62–65 cm for division viol, and 66–71 cm for consort bass.²¹ However, this does not correspond to seventeenth-century definitions of these sizes: even the upper end of Bessaraboff’s range for consort basses is significantly shorter than Talbot’s 30 inches (76 cm), and in fact is barely long enough to match Talbot’s body length of 28 inches (71 cm) for a lyra viol. For the remainder of this article I shall therefore refer to Galpin’s instrument as a tenor viol rather than a lyra viol, as we turn our attention to the primary question of who made it.

19. Galpin’s notebook reveals the evolution of his thinking on this point: as reported by his grandson (“Canon Galpin’s Check Lists,” 18), “‘Tenor’ has been crossed out in ink and ‘Barytone’ substituted above. ‘Barytone’ has then been crossed out in a different ink and ‘Lyra’ substituted above that.”

20. Donington, “James Talbot’s Manuscript,” 31.

21. Bessaraboff, *Ancient European Musical Instruments*, 255. This corresponds to notions established during the early years of the twentieth-century revival of viol playing and still largely accepted today, despite the conflicting testimony of early writers like Playford and Talbot; such ideas in turn are based partly on the size of most surviving bass viols (which only rarely have a body length greater than 72 cm) and partly on the perceived difficulty of playing on instruments any larger than this.

Two Possible Siblings: The Addison Bass and Blunt Tenor Viols

The only other instrument that has ever been associated with Addison's name is a bass viol currently owned by a professional American gambist (fig. 2). Its handwritten label, now barely legible, may plausibly be read as "William [Addison in] / Long alley [over against] / Moo[rfields,] 1670," thus matching the label quoted in the mid-nineteenth century by Sandys and Forster.²² In 1993 I was able to bring this instrument to the Museum of Fine Arts in Boston for a side-by-side comparison with its supposed smaller sibling. The outcome of this encounter was that everyone present agreed the two instruments did not resemble each other at all closely, and therefore seemed unlikely to be the work of the same maker.²³ The most obvious differences have to do with their overall body outlines: on the bass, the area below the bridge is proportionally longer, while its shoulders have somewhat more of a reverse (or S-shaped) curvature and its corners (especially the upper pair) are more square, than the corresponding places on the tenor. In addition, both the shape and the placement of the soundholes are quite different on the two instruments, with those of the bass being both more curved and less upright (especially on the treble side) than those of the tenor.

Four years before this meeting of the two viols in Boston, the luthier John Pringle had made for me a copy of the Addison bass, after careful study of the original. When I subsequently showed him my photos of the

22. Sandys and Forster, *History of the Violin*, 251; see note 9 above. Since they do not specify anything further about the instrument itself, and moreover make conspicuous use of the passive voice in introducing Addison, together with John Shaw and Christopher Wise, as "other viol makers, whose labels have been seen (Hill's MSS.)," most likely they had no first-hand knowledge of it. Given the matching label texts and dates, and in the absence of any other candidates, it seems reasonable to assume that the viol seen by the Hills is identical to the unique example known today. The phrase "Hill's MSS" is probably a reference to notes compiled by a member of the Hill family, who during most of the nineteenth and twentieth centuries were makers, dealers, and restorers of bowed string instruments in London, from 1880 to 1992 trading under the name W. E. Hill & Sons. A later collection of such notes on English instrument makers, assembled during the early twentieth century and now at the Ashmolean Museum in Oxford (MS WA 1992.643.1/2), does indeed contain this text as an example of Addison's labels; however, it is there credited to W. Meredith Morris, whose own source (as we shall see) was most likely Sandys and Forster's book.

23. This conclusion rests, of course, on the assumption that viols by a given maker will resemble each other in overall appearance, even when they are of different sizes, a point that will be discussed below.



FIGURE 2. Bass viol by William Addison: front, back, and side views. Private collection, California. Photographs courtesy of John Pringle.

tenor, he commented that it appeared to have been made considerably earlier in the seventeenth century than the bass.²⁴ With this observation in mind, in 1999 I suggested to Michael Fleming, an English luthier who was then writing a doctoral dissertation on English viols made prior to the mid-seventeenth century, that he should include Boston on the itinerary of his planned research trip to the United States, in order to see the ex-Galpin tenor viol for himself. First, however, he came to visit me,

24. Having also made numerous instruments based on examples by John Rose (an identically named father and son pair together active from before 1552 to 1611) and Henry Jaye (fl. 1610–1632), Pringle was already also very familiar with the style of viols by these early English makers, and had in addition published an article on the Roses and their surviving output: “[John Rose,] The Founder of English Viol-Making,” *Early Music* 6, no. 4 (October 1978): 501–11.

and as soon as he saw my photo of its back he recognized that the distinctive patterning of the wood used there closely matches that found on the back of a viol in the Ashmolean Museum in Oxford. This instrument, part of the museum's Hill Collection of musical instruments, is identified in David Boyden's catalogue as a "small bass (lyra) viol by Richard Blunt, London, 1605"²⁵ (fig. 3).

As with Galpin's tenor in Boston, the original written basis for the attribution and dating of the Oxford viol is not currently to be found inside the instrument. Boyden's entry continues with the following explanation: "Label: none in the instrument at present. However, Mr. Desmond Hill says: 'my records state that it is the work of "Richard Blunt, dwelling in London in Fetter Lane, 1605.'" This is the wording of the manuscript label which should be inside."²⁶ Moreover, a different though related source provides confirmation that there was indeed such a label inside this instrument when it was first acquired by the Hills: Alfred Hill's diary for July 10, 1914, reads in part as follows: "We have purchased from a Miss Oliphant of Brixton a small English Gamba, bearing a written label of Richard Blunt, with the date of 1605."²⁷

Figure 4 shows the backs of these two tenor viols, revealing their corresponding patterns of flame, and especially certain telltale flaws in the wood, the most notable being a blotch in the upper left quadrant, just below the fold, and a kind of artificial boundary where the flame disappears in the lower right quadrant. Taken together, these features strongly suggest that the two backs were made with wood cut from the same log. The tables of these viols likewise closely resemble each other, even to the

25. David D. Boyden, *Catalogue of the Hill Collection of Musical Instruments in the Ashmolean Museum, Oxford* ([Oxford]: Oxford University Press, 1969), 12 and plates 6a–f. This collection, featuring instruments of both the violin and viol families but including some of other types as well, was donated to the museum by the firm of W. E. Hill & Sons over a period of years beginning in 1939.

26. In an earlier and much shorter published description of the Hill Collection, Thurston Dart wrote of this viol, "Label: 'Richard Blanke bewling (?) on London in ffeter lane 1605' ": "The Instruments in the Ashmolean Museum," *Galpin Society Journal* 7 (1954): 7–10, at 9. Dart does not say whether he saw such a label himself, but this seems more likely than not, considering the extent to which his transcription differs from that provided to Boyden by Desmond Hill.

27. Quoted by courtesy of Charles Beare. Hill adds: "The rarity of our English viols is remarkable. . . . This is the first time I have ever seen one bearing the name of Blunt." Together with his brothers, Alfred Ebsworth Hill (1862–1940) was a partner in the firm of W. E. Hill & Sons founded by their father. Desmond Hill (b. 1916), a son of Alfred, was a later head of the firm.



FIGURE 3. Tenor viol attributed to Richard Blunt: front, back, and side views. Ashmolean Museum, University of Oxford, WA1939.34 (Boyden no. 6).



FIGURE 4. Backs of two tenor viols attributed to Richard Blunt (left, Oxford; right, Boston). The corresponding features of the wood reveal that both backs were cut from the same log. Part of illustration L27 in Michael Jonathan Fleming, "Viol-Making in England c. 1580–1660" (PhD diss., The Open University, 2001; Oxford: published by the author on CD-ROM, 2002). Courtesy of Michael Fleming.

extent of featuring a similarly asymmetrical placement of the sound-holes, with the one on the treble side being slightly lower in each case (fig. 5). And the carvings on the back of the two pegboxes, while not precisely identical, are certainly very much in the same style, albeit laid out in mirror image to each other (fig. 6).

In addition to their visible similarities, the bodies of the two tenors are nearly identical in size, according to measurements of both made by Fleming (see table 1).²⁸ The maximum widths of the upper and lower

28. Michael Jonathan Fleming, "Viol-Making in England c. 1580–1660" (PhD diss., The Open University, 2001; Oxford: published by the author on CD-ROM, 2002), 271 and 275. I have chosen to use Fleming's measurements rather than those published in the official museum catalogues by Bessaraboff (for the Boston tenor) and Boyden (for the Oxford tenor) in order to ensure a uniform approach; the widths and depths

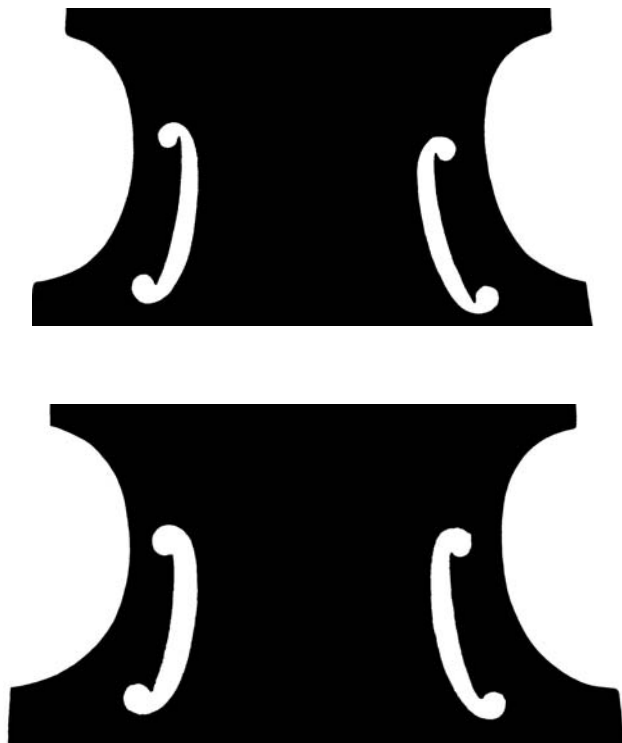


FIGURE 5. Silhouettes of the C-bouts of two tenor viols attributed to Richard Blunt (top, Oxford; bottom, Boston), showing similar asymmetrical positioning of soundholes. Illustration L52 in Fleming, “Viol-Making in England c. 1580–1660.” Courtesy of Michael Fleming.

bouts (as taken on the flat backs), as well as the maximum rib depth (measured at the bottom block), differ by only a millimeter, which is within the margin of error for such measurements; the minimum widths of the center bouts differ by 7 mm on the backs but are identical over the arched fronts. Body lengths (as taken over the archings of the fronts)

recorded by those earlier writers differ from Fleming’s, in some cases by as much as 6 millimeters. This may reflect different measuring techniques, changes in the instruments themselves over the intervening decades, or both. My own measurements of the Boston instrument in turn differ slightly from those reported by either Fleming or Bessaraboff; I have not had an opportunity to measure the Oxford instrument.



FIGURE 6. Pegboxes of two tenor viols attributed to Richard Blunt (left, Oxford; right, Boston), showing similar carved decoration on their backs. Illustration L26 in Fleming, "Viol-Making in England c. 1580–1660." Courtesy of Michael Fleming.

are 560 mm for the Boston viol but 555 for the Oxford one, a difference of less than one percent.²⁹

All this evidence strongly suggests that the two tenors were made by the same person. But before accepting that Blunt rather than Addison was their maker, it is necessary to consider the more general issue of whether and to what extent it is reasonable to expect that two (or more)

29. Only the body of the Oxford viol is original: as Boyden notes (*Catalogue of the Hill Collection*, 12), "the neck, fingerboard, and tailpiece have been restored in appropriate 'old' style." This is confirmed by Alfred Hill's diary (see note 27 above), where he remarks that the instrument "has lost all its interesting original fittings. . . . With our skill and knowledge I think we can restore it satisfactorily."

TABLE 1. Body dimensions (in millimeters) of two tenor viols attributed to Richard Blunt.

Location, owner	Length of table	Upper / middle /	Upper / middle /	Rib depth	VME*
		lower widths on the table	lower widths on the back		
Oxford, Ashmolean Museum	555	266 / 195 / 312	268 / 195 / 316	105	21
Boston, Museum of Fine Arts	560	271 / 195 / 329	267 / 188 / 315	106	22

*VME = identifying number in Fleming, "Viol-Making in England c. 1580–1660"

viols by the same maker will look alike, let alone match so closely in size as these two do.

Other English Tenor Viols

In seeking comparable instruments, the first difficulty one encounters is that so few tenor viols have survived from either the seventeenth or the eighteenth century. In part this is because in most areas of Europe this size fell out of use sooner than either the bass or the treble, especially once composers and performers lost interest in music for whole consorts (using instruments all of the same type) after the mid-seventeenth century. Even more importantly, the tenor viol's size made it unsuitable for continuing use in a musical environment dominated by members of the violin family—unlike the many bass viols that were converted into cellos, and a smaller number of trebles adapted for playing on the shoulder as violas—with the result that obsolete tenors were probably more often discarded than recycled. In my comprehensive database of viols made before the twentieth-century revival of interest in old instruments, only 115 of 1611 entries (about 7%) are tenors, and only eight of these can be plausibly identified as having been made in England during the seventeenth century.³⁰

30. This database was begun in the late 1970s by the American luthier Peter Tourin, and self-published by him (in the form of customized computer printouts) under the title "Viol-List" for about a decade, beginning in 1979; I took over the project in 1990 and since then have expanded its coverage by more than fifty percent. Slightly more than half the entries are for basses, with another third made up of small sizes (pardessus, quintons, and trebles) and the remaining sixth divided not quite equally between tenors and violones. Only 65 of the 115 tenors are dated or datable, with about 55 percent of them having been made before 1700.

This small group includes, in addition to the Boston and Oxford siblings, three anonymous instruments (one presently in London's Victoria and Albert Museum [no. 153-1882]³¹ and the other two privately owned in England and Germany); an example with pointed body corners and an undated label (probably modern but possibly reproducing an earlier one) naming the otherwise-unknown William Bowcleffe (privately owned in Switzerland); and two signed by John Rose.³² One of the Rose tenors is part of the Hill Collection at the Ashmolean Museum,³³ while the other is on display at the Musée de la musique in Paris; they are dated 1598 and 1595, respectively (figs. 7–8).³⁴

31. This enigmatic instrument, with its relatively shallow ribs and table bearing only single purfling, is variously described by the museum as "English c. 1660" (on a display label seen by the author in October 2001) and "probably made in England . . . about 1660" (on the museum's website, <http://collections.vam.ac.uk/item/O142075/tenor-viol/>; when accessed on October 13, 2010, this description was unfortunately accompanied by a photograph showing a different instrument, no. 152-1882), but may be later and/or not English at all, though so far nobody has gone on record with any other suggestions as to the place or date of its origin.

32. John Rose is the earliest known English maker of viols, active at least by 1552; his son and namesake was active no later than 1580 and died in 1611 (see Pringle, "John Rose," 501–4). Because the date of the father's death remains unknown—suggestions have ranged from 1562 to 1598—it is unclear which one of them may have made these tenors or indeed any of the other viols signed by or attributed to Rose. The only other English tenors from any historical period presently known to me are four made in the 1760s by the German immigrant Frederick Hintz, which are exceptional in design and in their very late date, thus falling outside the scope of the present investigation. (For more on Hintz, who is better known today as a maker of English guitars, see Peter Holman, *Life After Death: The Viola da Gamba in Britain from Purcell to Dolmetsch* [Woodbridge, UK: Boydell Press, 2010], 135–60. I am grateful to Prof. Holman for allowing me to read this portion of his book prior to its publication.) All eight English tenors made before the eighteenth century have body lengths between 48 and 56 cm. Several other instruments measuring between 41 and 45 cm that have been called tenors by their owners or by other researchers are in my opinion better classified as large trebles, including one by Henry Smith (1623), two by Henry Jaye (1629 and 1667), two more unsigned instruments attributed to Jaye, and one by John Baker (1660). I am unaware of any extant English viols with body lengths between 45 and 48 cm, which therefore seems to mark a boundary line between the categories of treble and tenor.

33. It is described and illustrated in Boyden, *Catalogue of the Hill Collection*, 11 and plates 5a–f.

34. The Paris label is very difficult to read, not only as reproduced in Fleming, "Viol-Making in England," ill. L96, but also in person (*ibid.*, 332); the Musée de la musique currently interprets the date as 1604. This viol was formerly owned by the comtesse de Chambure, and is almost certainly identical to the Rose tenor that was owned by W. Howard Head when photos of it were published in 1930 (reproduced in Pringle, "John Rose," 510), giving 1598 as yet a third reading of the date.



FIGURE 7. Tenor viol by John Rose: front, back, and side views. Paris, Musée de la musique, E.980.2.394. Photographs by Jean-Claude Billing, courtesy of the museum.



FIGURE 8. Tenor viol by John Rose: front, back, and side views. Ashmolean Museum, University of Oxford, WA1939.33 (Boyden no. 5).

Because they were made within a decade of the reported 1605 date of the Oxford Blunt tenor, and especially because there are two of them, these Rose tenors offer an important point of comparison in seeking to establish a context for Blunt's work. Again using Fleming's measurements for the sake of uniformity (table 2),³⁵ we find that they are close but not identical in size: the upper and middle back widths are within a millimeter of each other, with the lower varying by 6 mm (front widths over the arching differ by 4 mm in each location) and the rib depth by 3 mm. At 538 and 551 mm, respectively, the body lengths, like the depths and lower widths, differ by approximately two percent.³⁶ Thus the two tenors by Rose, while not of precisely identical size, are close enough to be considered a pair, like the two attributed to Blunt. Moreover, it is clear that both Rose tenors are slightly smaller in both length and width than the two Blunts (while at the same time having slightly deeper ribs), meaning that the measurable differences between the two pairs exceed those between the sibling instruments making up each pair.

But simple body measurements such as these do not tell the whole story: they can and should be supplemented by other kinds of information, including an evaluation of the instruments' overall shapes. The body outlines of the two Blunt tenors do in fact resemble each other quite closely, notably in having hardly any inward curvature as the lower bouts approach the lower corners. The upper bouts of both instruments approach the upper corners only slightly less vertically, and show only minimal reverse curvature before the point where they meet the neck heel, while the contours of the middle or C-bouts are very similar on both as well. The two Rose tenors likewise display a close similarity to each other in the curvatures of their upper and middle bouts, although the lower bout of the example in Oxford appears wider relative to the upper bout than is the case for the Paris specimen. Partly as a result of this, the lower bout of the Oxford Rose shows a distinct inward curvature approaching the lower corners, which therefore form an angle slightly closer to 90° than on the Paris Rose, while the latter instrument in turn

35. Fleming, "Viol-Making in England," 271 and 275.

36. Both instruments have undergone significant alterations over the years, including in the case of the one in Oxford not only a new neck and external fittings (fingerboard, tailpiece, hookbar, pegs, and bridge) but also a new table, which according to Boyden (*Catalogue of the Hill Collection*, 11) is "an excellent replacement made by W. E. Hill & Sons before 1900." Boyden's dimensions for this instrument again differ from Fleming's, as was the case with the Oxford Blunt tenor.

TABLE 2. Body dimensions (in millimeters) of two tenor viols by John Rose.

Location, owner	Length of table	Upper / middle /	Upper / middle /	Rib depth	VME*
		lower widths on the table	lower widths on the back		
Paris, Musée de la musique	538	260 / 184 / 317	253 / 180 / 313	113	19
Oxford, Ashmolean Museum	551	256 / 180 / 321	254 / 179 / 319	116	20

*VME = identifying number in Fleming, "Viol-Making in England c. 1580–1660"

displays these characteristics to a greater degree than either of the Blunt tenors.³⁷ Ultimately, then, it is possible to say that, judged by their appearance as well as their dimensions, the two instruments attributed to Blunt resemble each other more closely than they do either one of the Roses, and vice versa.

It is tempting to take these observations as further support for the conclusion that the Boston tenor must have been made by Blunt. However, in truth they are something of a red herring, for neither identical body size nor similar geometry is a requirement for common authorship; in fact, it is very unusual for any two English viols to match each other so closely in size and shape as do these two pairs of tenors. This is primarily because such instruments were almost always built without a mold (that is, freehand, or "in the air"), with the result that their body outlines would naturally have exhibited a certain degree of variation even when new and even if intended to match.³⁸ But it is equally plausible that a maker may have deliberately chosen to build two viols of the same nominal size (i.e., treble, tenor, or bass) with different body dimensions,

37. Fleming ("Viol-Making in England," ill. L40) shows the bodies of all four tenors in identically sized silhouettes derived from his photographs, a technique that allows the viewer to focus exclusively on the instruments' outlines without being distracted by other features such as ornamentation or soundhole placement. This is especially useful for the Rose tenors because the presence of extensive ornamentation on the back of the Oxford example tends to create an optical illusion of larger size even in identically scaled images.

38. Over the past four centuries these initial differences have in most cases only been increased by the various repairs and rebuilding that most surviving specimens have undergone, to the point that, after close study of more than three dozen English viols made before the mid-seventeenth century, Fleming was forced to conclude that only a few of them can serve as reliable witnesses to the design intentions of their original makers ("Viol-Making in England," 65).

either to suit the varying physiques of the people commissioning them, or to accommodate different musical uses (as in the case of lyra, division, and consort basses), or because the instruments would be tuned to different pitch standards, or for some other reason.

Bass Viols by Jaye: Siblings but not Twins

That such a degree of similarity is not necessarily to be found among instruments of the same nominal size and by the same maker may be demonstrated by considering next a group of bass viols by Henry Jaye, who is, chronologically, the next important English maker of viols after Rose.³⁹ Both men appear in a short list of the best old makers published by Thomas Mace in 1676,⁴⁰ and in terms of extant instruments Jaye is the most prolific of any in England before Barak Norman, whose earliest dated viol was made in 1689.⁴¹ Fourteen of the twenty-two viols presently thought to have come from Jaye's workshop have labels, all but one of them dated within a period of slightly more than two decades, from 1610 to 1631.⁴² None of these are tenors, so direct comparisons with those by Rose and attributed to Blunt are impossible; rather, the current reckon-

39. Research by Fleming ("Viol-Making in England," 194–95) suggests that Jaye was born before 1580 and had died by 1641.

40. "Your *Best Provision*, (and *most Compleat*) will be, a *Good Chest of Viols; Six*, in *Number*; viz. 2 *Basses*, 2 *Tenors*, and 2 *Trebles*: All *Truly*, and *Proportionably Suited*. Of such, there are no *Better* in the *World*, than *Those of Aldred, Jay, Smith*, (yet the *Highest in Esteem* are) *Bolles*, and *Ross*. . . . *These were Old*; but We have *Now*, very *Excellent Good Workmen*, who (no doubt) can *Work* as well as *Those*, if They be so well *Paid* for *Their Work*, as *They* were; yet we chiefly *Value Old Instruments*, before *New*; for by *Experience*, they are found to be far the *Best*": Thomas Mace, *Music's Monument* (London: Printed . . . for the author, 1676; facsimile, New York: Broude Brothers, 1966), 244. "Ross" is here to be understood as an alternate spelling for "Rose." Of the three others, Bolles is today unknown by first name, surviving instruments, or other documentary sources; Thomas Aldred was active in the 1630s, with one bass viol currently known to survive, and Henry Smith from 1623 to 1637, with one treble and at least two basses extant. (Concerning a possible third bass by Smith, see note 49 below.)

41. For an initial attempt at listing Norman's output of both viols and violin-family instruments, see Benjamin Hebbert, "A Catalogue of Surviving Instruments by, or Ascribed to, Barak Norman," *Galpin Society Journal* 54 (2001): 285–329. My own database of antique viols currently contains at least fifty bass viols by Norman—plus several others of questionable authorship and three that may no longer be extant—along with only two trebles (and no tenors).

42. One treble, now at the Victoria and Albert Museum in London, bears the date 1667, but both its body and its label are nearly identical to those of a treble dated 1629

ing of Jaye's surviving output comprises twelve trebles and ten basses, with three of the latter having festoon-shaped bodies. This leaves seven basses with standard outlines useful for comparison here, four of which were included in Fleming's study. His measurements of them reveal a significant degree of variation in size, and adding data for the other three instruments in this group provides still further evidence of diversity (table 3).⁴³

Even excluding the smallest and largest of this group, and allowing for the likelihood that some of these dimensions may have been altered over time, the remaining five basses display a sufficient lack of uniformity to confirm that a single maker could and did produce instruments whose bodies varied by as much as 6 percent in both length and width, although these variations are not uniform across the four data points. Moreover, the largest of the seven viols has a body about 22 percent longer than the smallest, a discrepancy so large that it must surely be intentional rather than the result of minor differences in the execution of a single design. This ratio of physical sizes suggests that while both instruments were probably intended to be tuned as basses, the absolute pitches of their strings are unlikely to have been identical.⁴⁴

Figures 9–11 show three of the above seven instruments, namely the smallest and largest plus one of intermediate size, which, by a pleasant coincidence, was also once part of Canon Galpin's collection.⁴⁵ Again, it is important to evaluate them visually as well as numerically, though

at the Germanisches Nationalmuseum in Nuremberg. It may, therefore, have been made long after Jaye's death by a person or firm that continued to use his designs and "name brand"; for further discussion of this issue, together with a list of all twenty-two extant Jaye viols, see Michael Fleming, Thomas MacCracken, and Klaus Martius, "The Jaye Project," *The Viol*, no. 7 (2008): 25–27 (also available on the website of The Viola da Gamba Society, at www.vdgs.org.uk/information-JayeProject.html), where these two instruments are identified as JP 11 and 12, respectively.

43. Fleming, "Viol-Making in England," 271 and 275; measurements for the other three viols were kindly provided in private communications from other researchers: Peter Tourin (in 1990, for the 1631 bass); Gesina Liedmeier (in November 2005, for the 1611 bass at The Hague), and Klaus Martius (in January 2007, for the bass dated 1626), to all of whom I here express my thanks.

44. Jaye's dozen extant trebles show an even greater range of sizes, with body lengths from 327 to 436 mm.

45. A three-quarter front view of Galpin's Jaye was published as plate 17 (facing p. 90) in his *Old English Instruments of Music, Their History and Character* (London: Methuen, 1910); this is the instrument's first appearance in print since then.

TABLE 3. Body dimensions (in millimeters) of seven bass viols by Henry Jaye.

Location and current or former owner (date)	Length of table	Upper / middle / lower widths on the table	Rib depth	VME*
Paris, Musée de la musique (1624)	627	289 / 210 / 354	117	24
Germany, private collection (1626) (ex-coll. Alfred Lessing)	678	334 / 246 / 394	134	–
Germany, private collection (1631) (ex-coll. Grete Niggemann)	700	325 / 250 / 400	140	–
London, private collection (1611) (ex-coll. Francis Baines)	703	341 / 247 / 405	124	32
The Hague, Gemeentemuseum (1611) (ex-coll. Francis Galpin)	716	324 / 242 / 407	125	–
London, The Kessler Collection (1619)	721	336 / 240 / 397	140	37
France, private collection (1621)	766	354 / 260 / 421	139	38

*VME = identifying number in Fleming, “Viol-Making in England c. 1580–1660”



FIGURE 9. Bass viol by Henry Jaye: front, back, and side views. Paris, Musée de la musique, E.73. Photographs by Jean-Claude Billing, courtesy of the museum.



FIGURE 10. Bass viol by Henry Jaye: front, back, and side views. Collection of the Gemeentemuseum Den Haag, 0841238.



FIGURE 11. Bass viol by Henry Jay: front and back views. Private collection, France. Photographs courtesy of John Topham.

disregarding the necks, all of which have been altered or replaced.⁴⁶ Despite their significantly different sizes, the body outlines of these three viols resemble each other very closely, with the curvature of the upper, middle, and lower bouts appearing virtually identical except that the

46. The necks of the viols now in Paris and The Hague are both partly original, but the former has been lengthened and widened to accommodate seven strings, while the latter has been both re-angled and shortened (to such an extent that the seventh fret must now be tied on using a channel cut through the neck heel); that on the largest instrument is a modern replacement, reversing a nineteenth-century cello conversion in which the original was lost. The only Jaye bass with an original and undisturbed neck is the one dated 1619, in the collection of the late Dietrich Kessler, of which photos have been published in many places, for example Annette Otterstedt, *The Viol: History of an Instrument*, trans. Hans Reiners (Kassel: Bärenreiter, 2002), 108–10.

lower ribs of the 1611 instrument approach the lower corners almost vertically, while those of the 1621 bass curve subtly inward, and those of the 1624 slightly more so. All three sets of soundholes are likewise very similar in size, angle, and placement, with their lower eyes being approximately bisected by an imaginary line drawn between the two lower body corners. (There are, of course, differences as well as similarities among the three instruments, for example in their decorative features: while the table of the 1611 viol is plain, 1624 has a rosette and 1621 a purfled and stained floral ornament.)

A Bass Viol by Rose

At this point it will be useful to consider a bass viol by John Rose, for comparison both with the group of Jaye basses just discussed and with the two Rose tenors considered in a previous section. Owned since 1877 by the Victoria and Albert Museum in London, it contains a label reading simply "John Rose," with no indication of place or date (fig. 12).⁴⁷ Like so many such instruments, it has undergone various alterations and repairs, including conversion to a cello setup and subsequent rebuilding as a viol. Despite this history, it still retains the central portion of its original neck, albeit narrowed and probably attached to the body at a greater angle than it was initially. Fleming gives its body length as 710 mm, its widths as 331, 245, and 401 mm on the table (324, 236, and 398 on the back), and its rib depth as 129 mm.⁴⁸ In size it is therefore quite close to Galpin's Jaye, with its body length of 716 mm, widths of 324, 242, and 407 mm on the table (331, 237, and 400 on the back), and rib depth of 125 mm.

Comparing this instrument to the Jaye basses shown in figures 9–11, one obvious detail is that the lower eyes of the soundholes on the Rose bass are positioned completely below an imaginary line drawn between the lower body corners, unlike the Jaye soundholes, whose lower eyes are

47. The label is reproduced in Pringle, "John Rose," 502, and the viol itself is described and illustrated *ibid.*, 506–7. In contrast, the label in Rose's orpharion reads with extraordinary specificity "Ioannes Rosa Londini Fecit In Bridwell the 27 of July 1580" (illustrated *ibid.*, 501).

48. Fleming, "Viol-Making in England," 271 and 275 (VME 34). These measurements differ from those (705, 335/240/390, 130) published a generation earlier in Anthony Baines, *Victoria and Albert Museum, Catalogue of Musical Instruments*, vol. 2, *Non-Keyboard Instruments* (London: Her Majesty's Stationery Office, 1968), 3.



FIGURE 12. Bass viol by John Rose: front, back, and side views. London, Victoria and Albert Museum, 803-1877. Photographs © Victoria and Albert Museum, London.

more or less bisected by such a line. Of potentially greater significance is that the lower body corners of all three Jaye viols form a more open angle than is found on the Rose bass, whose lower-bout ribs do not curve inward as they approach these lower corners, even to the modest extent found on the Jaye instruments. Although in other respects the body outlines of all four viols are quite similar, scrutiny of this admittedly singular example by Rose provisionally suggests that the body shape and soundhole placement he favored differ somewhat from those used consistently by Jaye for instruments of approximately the same size.⁴⁹

Taking the process one step further, comparison of the Rose bass with the Rose tenors examined previously reveals that, while the tenors quite clearly have wider bottom bouts in relation to their respective lengths than the bass does, in other respects the body outline of the Paris tenor is quite similar to that of the bass in London, having similar curvature in the shoulder area and lower corners, in contrast to the Oxford tenor's more pointed lower corners. On the other hand, the positioning of the soundholes differs between sizes, with the tenors having their lower eyes approximately centered on the body corners (like the Jaye basses), while

49. As many as half a dozen other bass viols have also been attributed to Rose, but none with the same degree of confidence. Two of these (at the Ashmolean Museum in Oxford and privately owned in the United States, both unlabeled) have festoon-shaped bodies and thus belong to a completely different design concept from the instruments under consideration here. The same American private collection contains another bass viol with a barely legible label reading "Joh[n?] . . . / 1584"; however, significant differences in body outline, soundhole placement, and decoration between it and the Victoria and Albert Museum's instrument suggest caution before concluding that it too was made by Rose. Similar questions have recently been raised about a smaller bass viol in the collection of the late Dietrich Kessler (London) because, although a label bearing Rose's name was evidently once associated with this instrument, its strikingly close similarity to a bass viol by Henry Smith dated 1629 at the Metropolitan Museum of Art in New York (inv. no. 10.30.2) suggests that Kessler's instrument may also have been made by Smith. (I thank Roger Rose for first calling my attention to this resemblance, in a personal communication of September 30, 2008.) The Metropolitan Museum also owns a much-altered bass viol (inv. no. 1989.44) whose tentative attribution to Rose rests largely on the profuse ornamentation completely covering its back and ribs, which resembles that found on the festoon-shaped bass viol at the Ashmolean Museum. Finally, a bass viol credited to "John Ross, 1609" (an alternate spelling of the maker's name used by Mace among others: see above, note 40) on the strength of a "label written on linen" was included in the Galpin Society exhibition of 1951, at which time it belonged to someone named Noel Dilks; however, the published catalogue (*British Musical Instruments*, no. 508) provided neither measurements nor illustrations, and the instrument's subsequent fate is unknown.

the bass (as already noted) has them completely below.⁵⁰ It therefore appears that instruments of different size categories made by a given maker (or family, in the case of Rose) may reasonably be expected to exhibit variations in appearance to an extent equal to or even greater than those observable between viols of the same nominal size and origin.⁵¹

A Bass Viol by Blunt

This point is important in seeking to determine the authorship of the twin tenor viols in Boston and Oxford, whose similarities strongly suggest that they were made by the same person. As already noted, they do not closely resemble the unique bass viol by Addison. For Blunt there is likewise only a single additional instrument available for comparison, once again a bass. Inevitably, then, any attempt to determine whether the tenors are more likely to have been made by Addison or Blunt will involve comparing them with instruments of a different size. Whereas the group of Jaye basses discussed above confirms that there can be considerable similarity among examples of a single nominal size by the same maker, the comparison of two tenors and a bass by Rose reveals that viols of different sizes by a given maker will probably not be exact clones of each other, distinguished only by proportional adjustments due to the mathematical relationship of their intended pitches (such as 3:4 for a tenor tuned in G as compared to bass in D). Rather, a judgment of whether two such viols are the work of a single maker must be based on degrees of similarity in their physical appearance, supplemented by other factors such as details of craftsmanship and materials used, as well as larger historical trends and contexts.

50. Although, as noted above, the table of the Oxford tenor is a replacement made by the Hills, more likely than not they would have tried to replicate this and indeed many other features of Rose's original, assuming that it was still available to them as a model even if no longer usably intact.

51. John Pringle felt that "the only candidate for the work of Rose senior is the bass viol in the Victoria and Albert Museum," implying that all other instruments attributed to this family were made by the son; however, he also noted that "its label is markedly similar to that in the . . . viol in the Ashmolean dated 1598, and the wood of the back and ribs of the two instruments shows a similar taste for irregular figure" (Pringle, "John Rose," 502, with illustrations of both labels). For present purposes I have assumed that the younger man would have continued to use the designs and building techniques of his father.

For the past half century the Blunt bass viol has been kept in relative obscurity at the Museum Bellerive in Zurich, as part of a collection of instruments assembled over several generations by the proprietors of the Swiss music retailing and publishing firm Hug & Co., whose descendants donated it in 1962 to the city where they have their headquarters (fig. 13).⁵² The only previously published mention of this instrument appears in an extensively illustrated book on the viol by Adolf Heinrich König, which contains two photos of it, one a full-length view from the front and the other a detail of the carved lion's head atop the pegbox. In identifying these illustrations König provides a bare minimum of information, writing only "Bass-Viola da gamba by Richard Blunt, London 1591. This is a very early instrument and also interesting because of the maker."⁵³

As a first introduction, König's images offer little encouragement for associating this viol with the tenors in Oxford and Boston. The dominant initial impression is that the soundholes on the bass are of a very different pattern, being narrower overall, placed farther from the edges, set rather more vertically (especially on the treble side), and above all having a more pronounced curl approaching the eyes at the top and bottom ends in a manner not found on any other English viols but somewhat reminiscent of German practice. It turns out, however, that the frontal view of this viol is misleading, because its table is not original, being instead a relatively early replacement, probably dating from before the mid-eighteenth century. It is constructed of two main pieces (with two wings in the lower bouts) that have been carved to form the arching, rather than using the multi-stave construction that is typically—though

52. In July 2005 I was able to examine this instrument in person, through the kindness of Kristin Haefele of the museum's staff. I have also benefited from being able to consult copies of examination notes made by Annette Otterstedt and Hans Reiners (in 1991), Thomas Drescher (in 1996), and Klaus Martius (in 2007), all of whom I thank for sharing their insights with me. The Museum Bellerive's main function is to house the applied arts collection of Zurich's Museum für Gestaltung (Museum of Design), and the musical instruments in its care are not normally on public display; for more information on its holdings in this area, see Thomas G. MacCracken, "The Hug Collection of Musical Instruments at the Museum Bellerive in Zurich," *Newsletter of the American Musical Instrument Society* 35, no. 1 (Spring 2006): 12–13.

53. Adolf Heinrich König, *Die Viola da gamba* (Frankfurt am Main: Erwin Bochinsky, 1985), 88–89. All captions are given in both German and English, the latter usually being a shortened version of the former, which in this case reads "Baß-Viola da gamba von Richard Blunt, London 1591. Das im Museum Bellerive in Zürich befindliche Instrument ist nicht nur der frühen Epoche wegen, sondern auch hinsichtlich des Erbauers ein seltenes Stück." The viol is not mentioned in the book's main text.

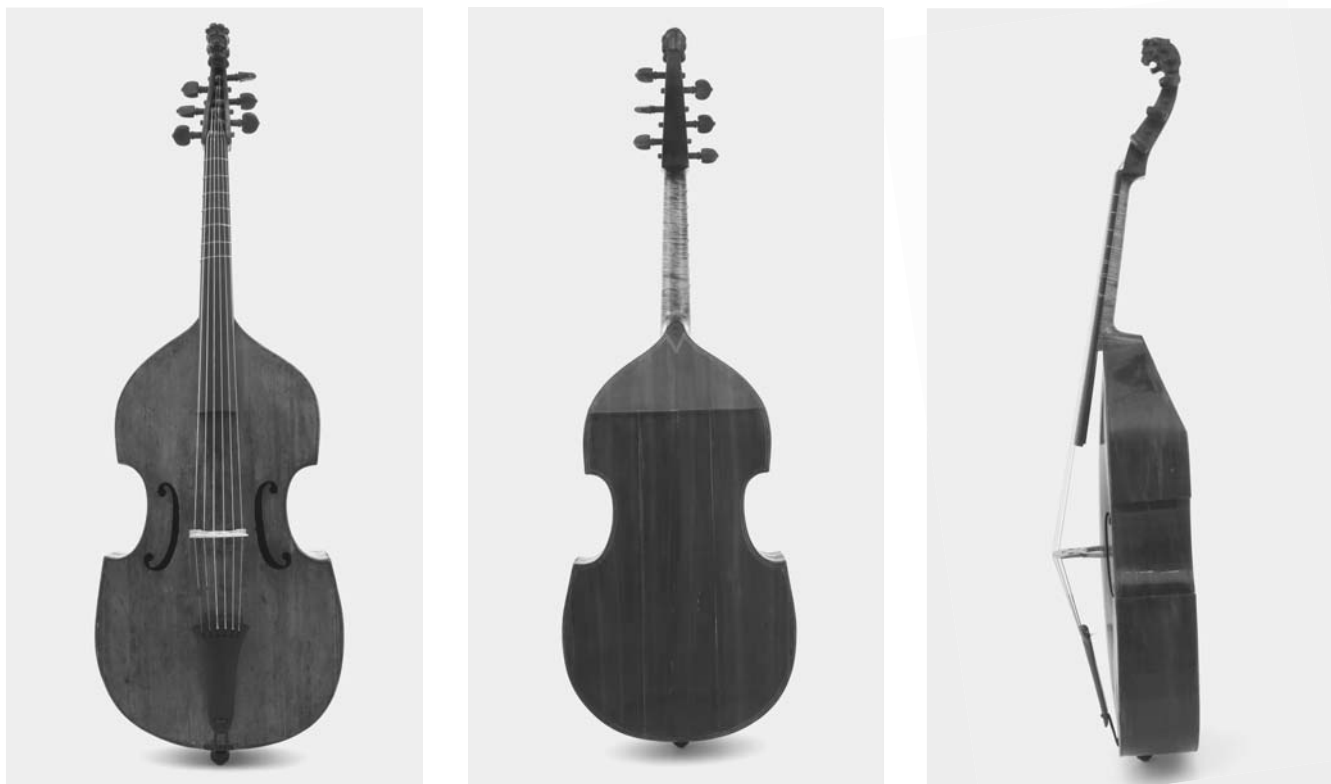


FIGURE 13. Bass viol by Richard Blunt: front, back, and side views. Zurich, Museum Bellerive, Museum für Gestaltung Zürich, Kunstgewerbesammlung, 1963-60,5. Photographs by Franz Xaver Jaggy, © Zürcher Hochschule der Künste.

not exclusively—found on English viols made before the final third of the seventeenth century.⁵⁴ Additionally, it bears only a double line of inked purfling around its edges, in contrast to the inlaid double purfling used by nearly all English viol makers throughout the seventeenth century.

The back and ribs, on the other hand, provide much more convincing evidence of English origin, being made of a fruitwood (probably plum) with double lines of blond-colored purfling inlaid around the perimeter of the back. Plum is found on a number of early English viols, where it is used most often in combination with maple to produce a back having five stripes of alternating light and dark woods. Surviving examples of this technique include three trebles and a bass by Jaye, as well as a bass by George Gibb that is privately owned in the United States and appears to have been made in 1598, only seven years after the Blunt bass.⁵⁵ Occasionally, however, an instrument's back and/or ribs are made en-

54. See Dietrich Kessler, "Viol Construction in 17th-Century England: An Alternative Way of Making Fronts," *Early Music* 10, no. 3 (July 1982): 340–45. A few French viols, notably those made by Michel Collichon (all during the decade 1683–93), also have multi-stave tables. Some early English viols have two-piece fronts, including the Rose tenor in Paris discussed above and a treble at Hart House in Toronto that has recently been attributed to the same maker, as well as the anonymous twin late sixteenth-century trebles now at the Royal College of Music in London and the Musikhistorisk Museum in Copenhagen (the former converted into a viola and the latter into a viola d'amore by Nathaniel Cross ca. 1730), which are fully described in Benjamin Hebbert, "Nathaniel Cross, William Borraceffe, and a Clutch of Tudor Viols," *Galpin Society Journal* 56 (2003): 69–76.

55. The first four of these are numbers JP 3, 7, 9, and 19 in the list of extant viols by Jaye given in Fleming, MacCracken, and Martius, "The Jaye Project." The Gibb viol is described and illustrated in William L. Monical's exhibition catalogue *Shapes of the Baroque: The Historical Development of Bowed String Instruments* (n.p., The American Federation of Violin & Bow Makers, 1989), 20–21, where he gives its date as 1688, although when this instrument was offered for sale at Sotheby's on June 21, 1984, their catalogue listed it as 1598 (and the maker's surname as Gibb; see Sotheby's, *Catalogue of Important Musical Instruments*, Thursday 21st June 1984, lot 45). Having examined the label myself (in January 2010, courtesy of the instrument's current owner) I can report that the second digit is almost certainly a 5 rather than a 6, but that this is followed by three more digits, so that the date at first appears to read "15988". While it is conceivable that what seems to be a 9 is instead some kind of ornament dividing the date into two halves (15 • 88), on balance it is more likely that the second 8 was for some reason subsequently added to an original date of 1598. (Illustration L83 in Fleming's "Viol-Making in England" shows what appears to be a tracing of this label, from the Hill Archive at the Ashmolean Museum in Oxford, but for copyright reasons this was not reproduced in the CD-ROM version of his dissertation.) No other instruments by this maker are known to exist.

tirely of plum, such as those of a treble and two basses by Jaye.⁵⁶ The three-piece construction of the Blunt viol's back is somewhat unusual at this time, but is also found on the ex-Galpin Jaye bass now at the Gemeentemuseum in The Hague (see above, fig. 10).⁵⁷ There is no reason to question the originality of this feature, even though the inside of the back has been significantly affected by modern restoration work, including the addition of three cross-braces and a thick new soundpost plate laminated to the original one, all of which sit on top of a coarse linen lining that covers the entire surface.⁵⁸

Another significant piece of evidence suggesting that this instrument is indeed English is its handwritten label, reading "Richard / Blunt / in London / 1591" in block capital letters (fig. 14). Currently the label is attached longways across the soundpost plate (thus reading horizontally from the bass side to the treble, rather than vertically from top to bottom of the instrument, as is customary), probably in order to avoid contact between its ends and the modern cloth lining of the back just above and below the plate. According to a display card prepared for an exhibition at the museum in 2007–8, the paper used for the label is handmade and

56. Fleming, MacCracken, and Martius, "The Jaye Project," JP 11, 13, and 16. The first two of these (a treble at the Victoria and Albert Museum in London and the bass at the Musée de la musique in Paris shown above in figure 9), have blond purfling to contrast with the dark wood of their backs, as does the Blunt bass. Reverse-color purfling is also found on the dark stripes of the backs of the Gibs and Jaye basses mentioned in note 55 above.

57. The small bass possibly by Henry Smith instead of John Rose, mentioned above in note 49, is another example from the first third of the seventeenth century. Three-piece backs are more common on English viols after about 1665, appearing on selected instruments by makers such as Thomas Cole, Thomas Collingwood, Edward Lewis, Richard Meares, George Miller, and John Pitts—all of whom, however, also made two-piece backs.

58. According to museum records, the instrument was most recently restored in 1986, by a certain Herr Wieser working at or for Musikhaus Hug in Zurich. However, the relatively narrow and continuously rounded cross-section of the neck and the angle at which it is attached to the body suggest that this neck was made in the mid-twentieth century. Other non-original components certainly include the tailgut-and-button fastening for the tailpiece (replacing an original hookbar), the fingerboard, tailpiece, and bridge (the latter marked "Atelier Musik Hug Zurich"), a set of small interior corner blocks, and probably also the pegbox, even though the latter has been grafted to the replacement neck. The lion's head, while seemingly old and likewise grafted to the pegbox, may not originally have belonged to this instrument; such heads are more commonly found on German instruments, and while a handful of other English viols now have lion's heads, their originality is in each case likewise open to question. Perhaps this head was added to the Blunt bass either at the time its replacement table was made, or else when the current neck was fitted.



FIGURE 14. Label of the Blunt bass viol shown in figure 13. Photograph by the author, reproduced by permission of the museum.

its inscription is written with traditional iron gall ink;⁵⁹ while both of these materials remained available into the twentieth century, on balance their presence here supports the assumption that this label is at least not modern, and very likely just as old as it claims.⁶⁰

The body length of this viol is 718 mm, its three widths are 349, 242, and 416 mm, and the maximum depth of its ribs is 127 mm.⁶¹ In length

59. I am grateful to Brigitte Stehrenberger for sending me a photograph of this exhibition document (personal communication of July 2, 2008).

60. The fact that it is entirely written in capital letters further supports the validity of its dating, as this style was common in the decades either side of 1600, being found for example on the labels inside the Rose orpharion made in 1580 (see above, note 47) and in several viols by Henry Jaye dated from 1615 to 1629.

61. These are my own measurements, taken on the front and varying by only one or two millimeters from those similarly obtained by Martius and Otterstedt; they also agree with König's except that he omits the body length in favor of an overall length of 129 cm. (Drescher's are different, using widths taken on the back, where my own results—331, 229, and 410 mm—likewise match his almost exactly.)

it is thus almost identical (within a few millimeters) to the Rose bass described above, as well as to the Jaye basses formerly owned by Galpin and Kessler, while being noticeably wider than any of them at all three points measured, by amounts ranging from one to three centimeters. (In contrast, the corresponding dimensions of the smaller Addison bass are 686, 319/227/337, and 120 mm.) A similar situation exists with the two pairs of tenors: even taking into account that the Rose examples are both slightly shorter than the Boston-Oxford twins, the latter are proportionally wider in both the upper and middle bouts, though not in the lower. Based on these measurements, it appears that Blunt favored a slightly fatter body shape than either Rose or Jaye did.

Comparing the outline of the Blunt bass with those of the tenors attributed to him reveals that on all three viols the angles of the upper body corners and the curvature of the upper bouts are indeed similar (though the treble shoulder of the Blunt bass now curves inward more sharply than is the case on the instrument's bass side, presumably as a result of repairs or rebuilding at some point in its history). However, the lower corners of the twin tenors are noticeably more open or oblique than those of the bass, which form a nearly right angle, due primarily to the somewhat tighter curvature of its middle-bout ribs as they approach the lower corners. At least in this respect, therefore, the bass does not resemble the tenors as closely as the latter match each other; nevertheless, the differences in body outline between the two sizes are no greater than those observed between the tenor and bass viols by Rose.

Addison or Blunt?

As previously noted, neither of the twin tenors now has a label, but a century or so ago they are said to have borne the names of two different makers, accompanied by dates sixty years apart. When investigating the origin of a stringed instrument it is of course not uncommon to find that the name inside it is incorrect, either because the label is an outright fake, or because it has been transplanted from a previous location, or (at least in more recent times) because it was never intended to do more than indicate the model from which the builder took his pattern or inspiration. In this particular case, however, since both Addison and Blunt were almost completely unknown, even to specialists, during the eighteenth and nineteenth centuries, and indeed remain largely so today, it seems unlikely that anyone would have used their names as part of

an attempt to deliberately falsify the authorship of either one of these viols.⁶²

Of the two, Addison at least rates a mention in several modern reference works on string instruments, though all of these entries appear to derive, at least in part, from the previously noted reference by Sandys and Forster to a viol label reading “William Addison in Long Alley over against Moorfields 1670.”

- In 1875, George Hart included Addison in an annotated, alphabetical list of English makers, giving only his name and “London, 1670.”⁶³
- In 1904, W. Meredith Morris provided a somewhat more expansive entry in a book entirely devoted to English makers: “Addison, William. London. Period unknown, but probably about 1650–75. It is not certain whether or not he made violins, but he made viols. Label:

WILLIAM ADDISON,
IN LONG ALLEY,
OVER AGAINST MOORFIELDS, 1670.”⁶⁴

- In 1922, Willibald von Lütgendorff described Addison as “an English viol maker, mentioned by Sandys and Forster, who give his label found in a viola [da gamba].” Lütgendorff quotes the text of the label exactly as given by them, in addition to noting that “a lyra viol by him is in the Galpin Collection (Hatfield).”⁶⁵

62. A person with such ideas is more apt to have obtained or created a label bearing some famous and preferably Italian name, such as Gasparo da Salò or Carlo Bergonzi—as was in fact done with two different viols by the Frenchman Nicolas Bertrand (fl. 1687–1725), which today are owned by professional players in France and the United States, respectively.

63. George Hart, *The Violin: Its Famous Makers and Their Imitators* (London: Dulau; Schott, 1875), 171; also in the 2nd ed. (1885), 283.

64. W. Meredith Morris, *British Violin Makers* (London: Chatto & Windus, 1904), 57, and similarly in the revised and considerably enlarged 2nd ed. (London: R. Scott, 1920; repr., Gretna, LA: Pelican Publishing Company, 2006), 90. Note that the line breaks in Morris’s transcription fall in different places than those on the extant label, probably because he inserted them on his own initiative; Sandys and Forster had given its text with no line breaks.

65. “Ein englischer Violenbauer, der von Sandys und Forster, die seinen in einer Viola gefundenen Zettel mitteilen, erwähnt wird. Eine Liraviolen von ihm befindet sich

- In 1928, Henri Poidras laconically wrote: "Addison (William)—London circa 1680. Imitator of Amati. Yellow varnish. No. 264." (This number refers the reader to an appendix containing a typographical transcription of a label reading "William Addison in [L]ong Alley / over against Moorfields 16..")⁶⁶
- In 1951, René Vannes appears to have combined information from several earlier sources in preparing his entry on Addison, whom he identifies as an "English luthier, active in London between 1650 and 1675. No violins by him are known, but he made viols. Galpin's *Old English Instruments of Music* mentions a lyra viol with the following label: *William Addison in Long Alley, over against Moorfelds, 1670.*"⁶⁷
- In 1960, William Henley wrote: "Addison, William. Worked in London, 1650–1675. Made several viols, also a few Amatese

in der Sammlung Galpin (Hatfield). Geigenzettel: William Addison in Long Alley / over against Moorfields 1670 (gedruckt)." Willibald Leo Freiherr von Lütgendorff, *Die Lauten- und Geigenmacher vom Mittelalter bis zur Gegenwart* (6th ed., Frankfurt am Main: Frankfurter Verlags-Anstalt, 1922; repr., Tutzing: Hans Schneider, 1975), 2:9. Unlike his source (and Morris), Lütgendorff inserts a single symbol for a line break midway through the inscription, whereas the extant label presents the text on three lines. In addition, Lütgendorff specifies that the label is printed, another minor but telling error, especially since he gives no indication he had ever seen either "Hill's MSS" or the instrument itself, whose label is in fact handwritten.

66. "Addison (William)—*Londres vers 1680*. Imitateur d'Amati. Vernis jaune. N^o 264." Henri Poidras, *Dictionnaire des luthiers anciens et modernes* (Rouen: Imprimerie de la Vicomté, 1924), 123. Instead of the first letter of the word "Long" there is a blank space, undoubtedly due to an error in typesetting.

67. "Luthier anglais, professait à Londres entre 1650 et 1675. On ne lui connaît pas de violons, mais il fit des violes. Le *Old English Instr. of Music* de Galpin mentionne une viole-lyre portant l'étiquette suivante: *William Addison in Long Alley, over against Moorfelds, 1670.*" René Vannes, *Dictionnaire universel des luthiers*, 2nd ed. (Brussels: Les Amis de la musique, 1951), 2 (reprinted identically in the 3rd edition of 1999). The label text he cites clearly derives from Sandys and Forster, probably via Lütgendorff, albeit with the addition of a typographical error in the last word, and Morris's statement that "it is not certain whether he made violins" has been changed into an observation that no such instruments are known. The reference to Galpin contains several factual errors: the putative Addison lyra viol is not in fact mentioned in his *Old English Instruments of Music*; it is illustrated in plate VI of his *A Textbook of European Musical Instruments* (see above, note 7), but not mentioned by name in the main text; and (as we have seen) the label quoted belongs not to Galpin's viol but to the instrument known from "Hill's MSS," though in Vannes's defense this last point is not completely clear from Lütgendorff's presentation.

violins—yellow varnish.” This is followed by transcription of the 1670 label almost identical to the one given by Morris.⁶⁸

- In 1968, Karel Jalovec said of this maker simply, “London, 1650–75. Built mostly violas,” followed by a transcription of the 1670 label with a single line-break after “Alley” (like Lütgendorff) but in italics (like Henley).⁶⁹

Of all writers subsequent to Sandys and Forster, only Lütgendorff has either given a source for his information or provided any reliable new information (by mentioning Galpin’s instrument in addition to the one whose label he quotes). Rather, as can be seen most clearly in the way they cite the text of the 1670 label, each author simply drew on the published statements of his predecessors, sometimes with demonstrable inaccuracy (Vannes) while in other cases making additional unfounded and almost certainly speculative claims about Addison’s work (Henley). It is therefore even more unlikely than for Sandys and Forster that any of them had seen either of the viols at the time associated with Addison’s name, still less any instruments of the violin family thought to have been made by him.

Although the name Blunt does not appear in any of these reference books, Lütgendorff does have an entry for a Richard Blunff, as the reported maker of a viol dated 1604 that was auctioned in 1759 at The Hague by the estate of Nicolas Selhof.⁷⁰ Since the date of this instrument

68. William Henley, *Universal Dictionary of Violin and Bow Makers* (Brighton: Amati Publishing, 1960), 1:10. Henley follows Morris in adding a line break after the maker’s name, though using italic type instead of Morris’s all capital letters. It remains unclear why Henley claimed that Addison did indeed make “a few . . . violins,” much less how he knew that they were in the style of the Amati family; his comment about yellow varnish may derive from Poidras, though the latter’s source of information on this point remains unclear.

69. Karel Jalovec, *Encyclopedia of Violin-Makers*, trans. J. B. Kozak, ed. Patrick Hanks (London: Paul Hamlyn, 1968), 1:91. “Viola” is probably a literal translation, and therefore misinterpretation, of Lütgendorff’s (or possibly Jalovec’s own) use of this term as an abbreviation for “Viola da gamba”; the dates 1650–75 appear to derive from Morris and/or Vannes.

70. See the *Catalogue d’une très belle Bibliothèque de livres, . . . livres de musique, . . . Ainsi qu’une Collection de toutes sortes d’instruments, Deslaises par Feu, Monsieur Nicolas Selhof. . .* (The Hague, 1759; facsimile with introduction by A. Hyatt King as *Catalogue of the Music Library, Instruments and Other Property of Nicolas Selhof, Sold in The Hague, 1759*, Amsterdam: Frits Knuf, 1973), 253, item no. 91: “Un dito [i.e., Un Viola da gamba] de Ricard Blunff, London, 1604.” Other English viols listed include two each

is only one year earlier than that claimed for the tenor now in Oxford, "Blunff" may well be the same person as Blunt; indeed, Lütgendorff himself raised the possibility that the name had been misread by the compiler of the auction catalogue.⁷¹

More recently, Michael Fleming has found two documents that may refer to the viol maker William Addison. One records payment in 1676 to a musical-instrument repairer named William Addis "for repairing and amending several of his Majesty's musical instruments"; the other documents the apprenticeship of a certain Francis Nicholson to a carpenter named William Addison in 1679. However, Fleming has been unable to uncover any trace of a viol maker named Richard Blunt.⁷² Essentially, then, there is no other evidence of the identities or activities of either Addison or Blunt apart from the handful of extant instruments associated with them.

Conclusion

The two tenor viols now in Boston and Oxford must have been made by the same person, not only because their sizes and shapes match so closely but because their backs were made with wood from the same tree. One of these tenors formerly contained the label of Richard Blunt dated

by Richard Meares and Henry Jaye (whose name is similarly mangled, once as "Geaye" and later as "Gay"), one each by William Baker and John Rose, and two by an obscure Northamptonshire maker whose name is rendered variously as Jorks and York. Clearly, the compiler of the catalogue was prone to making errors when transcribing English proper names from (presumably) handwritten labels inside viols.

71. Lütgendorff, *Die Lauten- und Geigenmacher*, 2:48. ("Blunff, Richard. London. 1604. Das Verzeichnis der 1759 im Haag versteigerten Selhofschen Musikinstrumentensammlung führt diesen vielleicht falsch gelesenen Namen auf.") This information was subsequently picked up by Vannes (*Dictionnaire universel des luthiers*, 34), who simply writes that the maker was active in London at the beginning of the seventeenth century: "Blunff, Richard. Luthier anglais, professait à Londres au début du XVIIe siècle." Likewise, Jalovec lists "Blunff, Richard; London, c. 1604. This name occurs . . . in the Selhof Collection of musical instruments, sold in 1759 in an auction in The Hague. It has often been misspelled." (*Encyclopedia*, 1:152).

72. Fleming, "Viol-Making in England," 322 (Addison) and 325 (Blunt). He does note the existence of a virginal maker named Thomas Blunte in 1594, and another named Edward Blunt after 1660, but there is no evidence for a connection between either one and the viol maker. However, another person named simply "Blunt," who was paid by Sir Francis Willoughby in 1574 "for nine weeks lodging the musicians," might conceivably be the same man (*ibid.*, 208 and 210).

1605, while the other once bore an inscription crediting [William] Addison with having made it in 1665. Only a single extant instrument is currently labeled with each maker's name: a bass viol dated 1591 by Blunt and a bass viol dated 1670 by Addison. Of these two potential siblings, the latter does not resemble the tenors at all closely, while the former (apart from its non-original table) displays differences no greater than those observable between a pair of tenors and a bass made by John Rose at close to the same time. Conversely, the three Blunt viols can be distinguished as a family group from the three Roses, primarily by a body outline that is slightly wider in proportion to its length.

A final reason for assigning the twin tenors to Blunt is that by Addison's time, around 1670, there would have been virtually no market for tenor viols in England. Henry Purcell's fantasies, written during the summer of 1680, are often cited as the last English compositions for consort of viols (meaning an ensemble consisting of one or two each of the treble, tenor, and bass sizes), but their intended instrumentation is never specified and they may have come into being mainly as abstract counterpoint exercises, or else have been performed by varying combinations of violins, violas, and bass viols. Setting these exceptional pieces to one side, it is difficult to identify any music written after the Restoration of the English monarchy in 1660 that requires the participation of treble and tenor viols,⁷³ though the bass size continued in use in that country for more than another century, not only playing continuo to the newly popular violin (as well as wind instruments and singers) in works of chamber music, but also as a solo instrument in its own right.⁷⁴ Therefore, while musicians—especially amateurs—may well have continued to play the existing consort repertoire for some time after 1660, it is unlikely they

73. When Charles II returned from exile in France he brought with him a preference for the kind of music he had heard there: according to the contemporary observer Roger North, "upon the Restauration of King Charles, the old way of consorts were layd aside at Court, and the King made an establishment, after a French model, of 24 violins, and the style of the musick was accordingly." North further reports that while "this French manner of instrumentall musick did not gather so fast as to make a revolution all at once, but during the greatest part of that King's reigne, the old musick was used in the country, and in many meetings and societys in London; but the treble violl was discarded, and the violin took its place" (John Wilson, ed., *Roger North on Music* [London: Novello, 1959], 349 and 351).

74. It is precisely this period of the instrument's history that is the focus of Holman's recently published book, *Life After Death: The Viola da Gamba in Britain from Purcell to Dolmetsch* (cited above in note 32).

would have continued to commission new viols of the smaller sizes during that twilight period.⁷⁵

If the Oxford tenor were anonymous, it could nevertheless plausibly be identified not only as English but also as dating from around the start of the seventeenth century, based on its overall design and appearance. In that case, comparison with the Blunt bass might not have been sufficient to suggest a common authorship, since these two instruments are not as strikingly alike as are the Boston and Oxford tenors. But neither does such a comparison provide sufficient grounds for denying Blunt's authorship of the Oxford tenor, considering the Hill family's testimony that the instrument once contained a label attributing it to Blunt with a date of 1605 and also the comparable differences noted between a bass and two tenor viols by his contemporary Rose. And if it is accepted that Blunt made the Oxford tenor, then the same verdict must follow for its twin in Boston.

Considering all the available evidence, therefore, the answer to the question posed in the title of this article is that Canon Galpin's viol was made, not by William Addison (as he believed), but rather by Richard Blunt.⁷⁶

75. Although Mace, in 1676, still advised his readers to acquire a set of six viols, including two trebles, two tenors, and two basses (*Musick's Monument*, 245, quoted above in note 40), this recommendation follows an extended diatribe against newer musical fashions, in particular the composing and performing of music for what he considered the mismatched ensemble of "*One Small Weak-Sounding-Bass-Viol, and 2 or 3 Viols, . . . [as] is a very Common Piece of Inconsiderate Practice, at This Day,*" replacing the "*Musick most Excellently Choice, and most Eminently Rare*" of his younger years, such as "*Fancies of 3, 4, 5, and 6 Parts . . . Performed, upon so many Equal, and Truly-Seiz'd Viols.*" As he notes with evident distress, "*Tis Great Pity they are so soon Forgot, and Neglected, as I perceive they are amongst many*" (*ibid.*, 233–34).

76. The Museum of Fine Arts adopted this reattribution a decade ago, based on evidence presented by Fleming both in his dissertation ("Viol-Making in England," 322) and in earlier private communications with the museum.