THE RECONSTRUCTION OF A 16th-CENTURY ITALIAN TRUMPET

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Marine archeological research has been going on in Dutch coastal waters for some time, surveying the sea bed for long-lost wrecks. One very notable area of historically interesting shipwrecks is in the vicinity of the island of Texel. Texel was not always an island; in the early Middle Ages it was a large peat bog. The bog was drained by digging ditches, and from around the year 1000 the emerging land was used for agriculture. In the 11th and 12th centuries the low-lying land around Texel was swept away by the sea and Texel became an island. In time, the sea channel between Texel and the mainland of northern Holland, called the Marsdiep, became deeper and wider. This enabled boats to sail from the Zuiderzee, a shallow inland sea, to the open water of the North Sea. Prevailing westerly winds, however, made it dangerous and difficult for sailing ships to pass through the Marsdiep. From the 15th century on, ships would shelter under the southeast lee of Texel and wait for favorable winds to take them into the North Sea (see map, Figure 1).

Figure 1
Map of the Zuiderzee. The island of Texel is in the lower left corner of the map; Amsterdam is in the lower right corner.

The lee quarter of Texel became increasingly important as ships in the 17th and 18th centuries grew substantially heavier. The larger ships were forced to off-load there onto smaller ships because they could not pass fully laden from the Zuiderzee through to Amsterdam, the commercial center, or to the Zaanstreek, the contemporary industrial center of Holland. These smaller ships were shallow-draughted vessels, called lichters or *waterschepen.* The Zuiderzee, now an area of agricultural land reclaimed from the sea, is littered with wrecks of these vessels. The on- and off-loading of both freight and passengers took place under the lee of Texel at a place called the Stead. Traffic there presumably was somewhat chaotic, owing to the absence of navigational rules and the fact that captains were ever on the lookout for the best spot to anchor.

Of about 140 ships that sought shelter from a storm in 1593, forty-four were wrecked, and about 1000 men drowned. The well-known 16th-century poet and writer Anna "Tesselschade" Roemer Visser owes her second name (which means "damage on Texel") to the fact that her father, a ship-owner trading to Riga, lost some of his wheat-laden cargo ships during that storm. Subsequent stormy seasons resulted in hundreds of ships being lost there.

Figure 2
Map showing part of the present-day Netherlands and the Zuiderzee. The arrow identifies Scheurrak S01, an area of many shipwrecks. The island of Texel is to the left of the arrow.

Many wrecks survive in the soft sea-bed sediment around Texel; one of these is at the Scheurrak SO1 (see map, Figure 2). The Scheurrak is a part of the Texelstream where at the change of the tide the water flows in or out the Waddenzee. From time to time the erosive action of the tide washes previously unknown wrecks free, and thus it was in 1984 that this wreck was discovered. A summary survey of the loose material revealed a well-preserved thirty-meter-long ship from around 1580-1600, with the prospect of much more to be unearthed. It is tempting to assume that this ship is one of the unfortunate vessels sunk in the great storm of 1593, in view of the fact that she was laden with a cargo of wheat and was on the return voyage from the Baltic Sea (Riga). In addition to a quantity of wheat, some rigging, a carpenter's box, and some shoes, the subject of this article—a trumpet—was brought to the surface.

Terminology of the trumpet

In order to describe exactly what was found, it is necessary to define the constituent parts of an early 17th-century trumpet, which are (see Figure 3):

-the mouthpipe, into which a mouthpiece fits
-the lower yard
-two bows, front and rear
-the bell with garland and ball or balls
-sleeves (usually five)

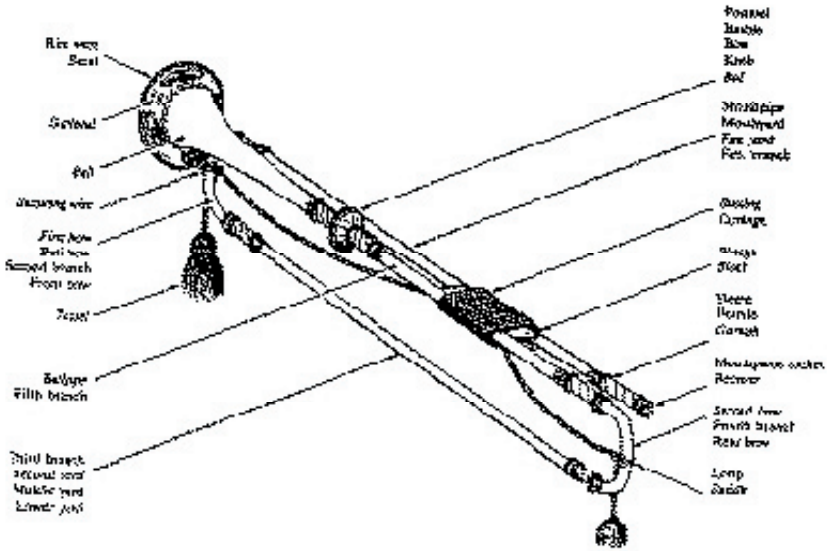

Figure 3
A "typical" 17th-century trumpet.

The instrument is assembled by means of tapered joints. The fitting is done in such a way as not to interrupt the airstream: thus the mouthpipe is inserted into the frontbow, the lower part of the frontbow into the lower yard, and so forth. The mouthpipe and the bell are bound together with cordage wound around a wooden spacing block, and the bell end is attached to the frontbow by means of a small twisted metal wire. The trumpet thus consists of fourteen metal parts: mouthpipe, two bows, lower yard, two saddles with eyelets, five sleeves or garnishes, a ball, the conical bell section, and the more or less decorated garland.

Almost all the constituent parts of the retrieved trumpet were found; some still fit, while others were loose, a little corroded, and/or distorted (see Figure 4):

-a mouthpipe
-two bows with saddles
-the lower yard
-the bell section with two "balls" and the garland

The mouthpipe

This instrument's mouthpipe is completely intact, but the seam is open owing to the corrosion of the solder. The tube is rolled from sheet metal and soldered with a butt seam. The sleeve at the mouthpiece end is still in place and completely round. Thus it is possible to measure the mouthpiece-inlet as exactly 11.5 mm in diameter. The other end of the pipe is still fitted to the frontbow. As the tube tapers into the frontbow, it can be assumed that it was so designed, without knowing exactly how much the tubes overlap. The external diameter of the mouthpipe is approximately 11.8 mm, and 10.8 mm just before the frontbow. The total visible length is 560 mm, including the mouthpiece sleeve. The wall thickness of the tube cannot be measured exactly, but is approximately 0.5 mm.

The frontbow

The frontbow is still fitted over the mouthpipe and has suffered no distortion at all. The bending is accomplished in two sharper curves rather than a semicircular one. The tube of the bow is also made of sheet metal, with a soldered butted seam. The seam is in the level of the bending, which reduces the danger of splitting the seam. A butted seam can be used on the bow if the material is sufficiently thick (between 0.5-0.7 mm). The solder is probably different from that used on the mouthpipe, because the seam on the bow has not corroded away. At the lower end of the bow there is a small extra tube with a ferrule. The tapering required to fit into the lower yard is made only on this small tube (see Figure 4). This is a feature not seen on Nuremberg trumpets and its purpose is to extend the bow slightly—perhaps to disguise a repair. The diameter of the tube of the bow and the small taper is 11.6 mm, a little less than that of the mouthpipe. The saddle in the middle of the bow is still there, and the eyelet is somewhat corroded.

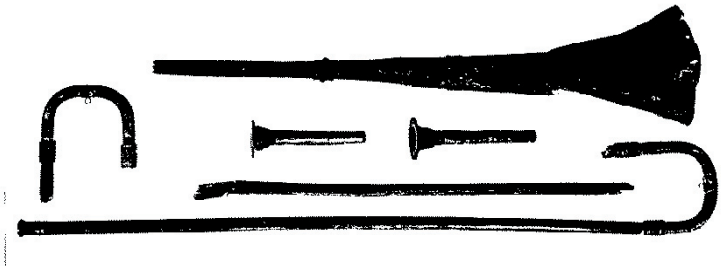

Figure 4
Constituent parts of the trumpet retrieved from the shipwreck.

The lower yard

Here there is a tube about 470 mm long. Both ends have been subject to corrosion. The seam, butted like the mouthpipe, has opened. The diameter is the same as that of the bows, 11.6 mm.

The rear bow

The bow is complete and undamaged, though some parts of the butt seam have opened. The shape of the bow and the position of the seam are identical to that of the frontbow. The bending was also, as in the frontbow, done with the seam in the neutral line. The diameter of the tube is also 11.6 mm. A small section of tubing, presumably part of the lower yard, obtrudes from the bow. It could, however, be a part of the bell section, in which case the goal of creating an undisturbed airstream throughout the instrument was not sought here. The small section of tubing stuck into the bow could have had the same function as that found on the front bow: a small tapered end to fit into the next part. On both bows the saddle and its ring are found in the middle of the bow. The saddle is simply engraved with a leaf-like pattern; the zig-zag pattern (known as *waggelstich*) used by most Nuremberg engravers is not to be found.[1]

The bell section

It was to be expected that this part of the instrument would be somewhat damaged, but the bell is neither totally flat nor ripped off. Two thirds of the bell exhibits the usual overlapped tabbed seam where strength is required; the narrower third is soldered with a butted seam. That end is provided with seven teeth, like a crown, with some rings engraved around it. Two balls are found: one is a flat ring with engraved semicircular tabs resembling leaves on both sides. The body of this ring is engraved with oblique lines. The other ring, which is more "ball-like," is small, semicircular in cross section, and also with a pattern of oblique engraved lines. On each side there are small leaves of the same type, as are found on the garland, described below.

The garland

The garland is 22.1 mm in diamter, the smaller end exhibiting petal-shaped tabs engraved to resemble leaves. The garland is attached by means of a narrow metal strip about 3 mm long, crimped over the end of the bell. There is no extra reinforcing wire on the garland. The strength comes from three layers of thin metal: the garland itself, the bell, and the crimped strip. The garland is engraved with large capitals, with oblique lines in between the letters *LISSANDRO MILANESE FECIT GENOA 1589*. Unlike most such engravings, this inscription is not readable from the position of the player, but rather from the front of the instrument. The engraving is done very neatly, probably by the maker himself. The letter "D" in the maker's name is reversed.

The sleeves

The instrument has six garnished sleeves that embellish and strengthen the points at which the tubes slot into one another. Four of the sleeves are about 18.5 mm in length, each being about 15 mm in diameter. The brass is rather thick here. A simple profile is turned on the sleeve, which is decorated further by a ring of small rectangular punches in the middle. This feature is also found on the unnamed and undated sackbut belonging to the Academia Filharmonia in Verona (perhaps the same maker?). The sleeve at the mouthpipe is slightly different from the other sleeves, having an engraved pattern of oblique lines and twigs. The third sleeve is a ring about 6 mm wide and 14.5 mm in diameter. It is attached to the small tapered tube with which the frontbow is fitted into the lower yard (see also "Frontbow").

Uses of the trumpet

It is well known that in the 16th century trumpets and horns were not only musical instruments, but were also used for signaling purposes. The city waits used horns to sound the alarm in case of fire and when the city came under attack. The hunting horn was used to transmit messages over a greater distance than could be accomplished by the human voice. The trumpet always enjoyed a higher social status. It was used on state occasions and in connection with people of high social rank as well as in the military. The training and working conditions of trumpeters were highly regulated and governed by a system of guilds.[2] The trumpet was traditionally also associated with the divine Fama, the spreader of both good and bad tidings.[3]

The probability that trumpets were used on board ship is supported by one of the requisition lists of the VOC (the Dutch East India Company, founded in 1602).[4] Beneath the headings for sails, rigging, pots and pans, and cannons, appears the heading "ships ammunition," with the accompanying entry "kastje met 1 trompet" (a trumpet in a small wooden box). In addition, parts of trumpets are found in or around the various sites of other shipwrecks. One famous example is the wreck of the Dutch East India Company ship

Batavia off the west coast of Australia in 1629.[5] Parts of a trumpet including the garland were retrieved recently from the wreck site. The trumpet was made by Conrad Droschl (Nuremberg, 1596-1644). The maritime role of the trumpet is a subject well worthy of further study.

On board ships it is almost certain that the boatswain's whistle was used to give the sail-setting and navigational signals. The sound is both high and shrill and can even be heard above a storm. Throughout the ages, however, the use of trumpets on board ships was rather significant and was connected with ceremony. From the 13th century onward, trumpets are often found on the seals of the newly burgeoning British city ports.[6] For example, two players, each blowing a straight trumpet, are found on the seals of Tenby and Faversham (Figures 5 and 6). Trumpeters were used to signal from ship to ship and from ship to shore. They may also have been used to give signals for the onboard cannons.

Figure 5
Seal of the port of Tenby. Note trumpet player on left.

Figure 6
Seal of the port of Faversham. Note trumpet player on left.

In the 16th century the distinction between signal instruments and musical instruments was not as clear as it is nowadays. If the instrument is highly engraved and skillfully polished and gilded, one can assume that its function was largely ceremonial. If it is well made in brass with simpler engraving one can assume that its function was musical or that it was possibly used for signaling. In this respect it is interesting to note that the first two books on the trumpet, Cesare Bendinelli's *Tutta l'arte della trombetta* (1614; some sections from 1584 and 1587) and Girolamo Fantini's *Modo per imparare a sonare di tromba* (1638)[7] deal with the ceremonial and military as well as the musical use of this instrument.

Considering the importance of the trumpeters of the church of San Petronio in Bologna in the development of trumpet literature, as well as the increasing use of trumpets in Italian opera literature, it is noteworthy that not a single instrument made by an Italian maker survives, except for those attributed to Ubaldo Montini, dated 1523 and 1520.[8] According to Carlo Gervasone, Ubaldo Montini was born early in the 18th century and died around 1800.[9] He lived in Siena and was a renowned maker of brass instruments. Montini's dates and the fact that the instruments have no features in common with 16th-century manufacturing methods or stylistic traits of that period suggest that the attribution of these two instruments to Montini should probably be discounted. But until the possible existence of another Ubaldo Montini during the 16th century has been thoroughly investigated, the question will remain unresolved.

Since all existing trumpets of confirmed Renaissance origin were made in Nuremberg, or at least north of the Alps (e.g. Basel), the discovery of Lissandro's trumpet is of considerable importance. The presence of three mouthpieces with the instrument makes the find even more exciting. In addition the fact that it is possible to deduce the pitch at which the instrument was played makes it almost unique, since most of the extant instruments have been altered many times in order to adapt to the pitch requirements of following generations.

The making of a replica

The author measured all the component parts of Lissanro's trumpet thoroughly and then prepared a full-scale drawing. The calculation of the circumference of the bell opening was made with the help of photographs. Owing to the fact that the bell section was not completely flattened but was pressed into an oval, it was possible to calculate the original cross-section (see Figure 7). A steel mandrel was cast and turned to shape on a lathe. The development and raising of the bell is a question of experience and it depends on wall thickness, shape itself, and the appropriate working techniques.

Traditionally the frontbow is secured to the bell by means of the wire that goes through a small hole on the leading edge of the bell. Since this little hole is extant on the original bell, with the frontbow and the entire mouthpipe also in good condition, it was possible to reconstruct the length of the instrument accurately.

I presumed that the mouthpipe sleeve should be mounted directly opposite the sleeve adjoining the rear bow and the bell, since this is a conventional feature of instruments of

that period. Approximately 130 mm of the small end of the bell is missing. This is probably the part that was hidden under the wooden spacing block and its cordage.[10] Approximately 75 mm of the lower yard was also missing. The overall diameter readings for the entire instrument were, however, easy to obtain. All the parts were made using only techniques available to the craftsmen of the period, and in the manner described by Robert Barclay in his book *The Art of the Trumpet-Maker.*[11] The two small decorative balls on the bell of the original instrument were probably cast. I decided to turn them on the lathe and finish them with files and engraving tools. The engraving of the garland was also copied after the original, right down to the reversed letter "D" (see Figure 7).

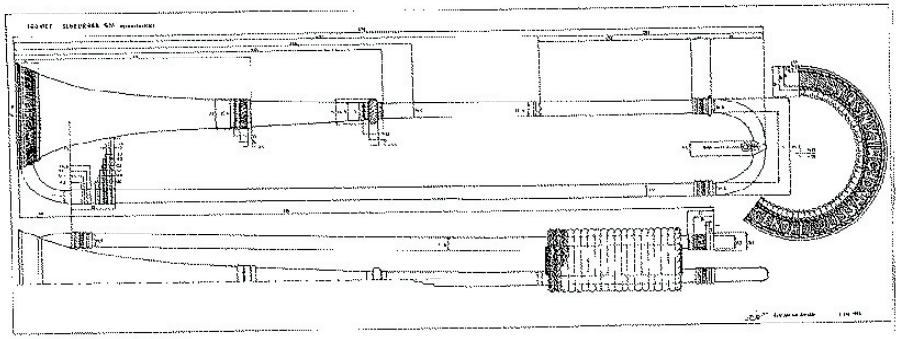

Figure 7
Scale drawing, by the author, of the reconstructed trumpet.

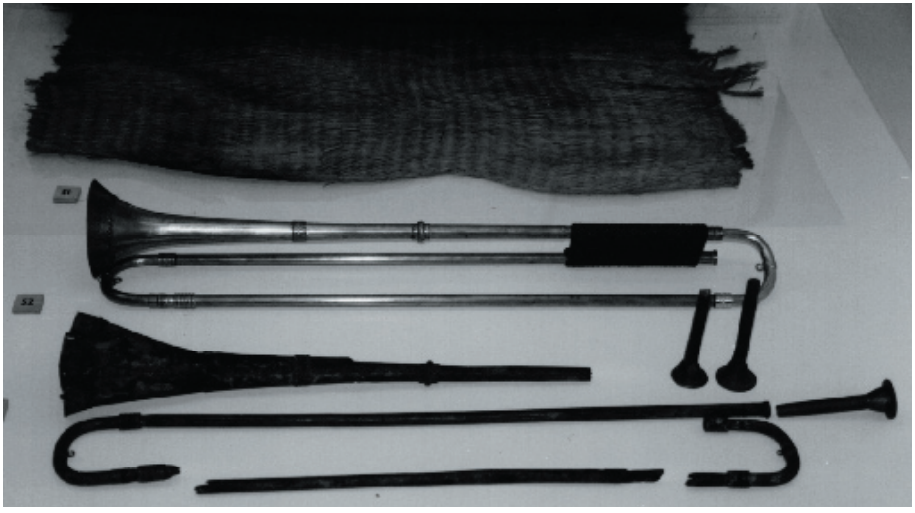

Figure 8
Reconstruction of Lissandro's trumpet, by the author, compared with the surviving parts of the original.

Comparing Lissandro's trumpet to instruments of Nuremberg manufacture

In comparing Lissandro's instrument to the familiar Nuremberg pattern, we find first that the diameter of the bell opening on the Lissandro trumpet is only 94 mm, whereas most German trumpets have a flare of between 104-110 mm. Second, there is no reinforcing wire behind the rim of the garland. Third, the maker's name, the date, and place of origin of the instrument are all engraved to be read from the front of the instrument and not, as in the case of Nuremberg instruments, from the position of the player. Fourth, whereas northern trumpets invariably have one ball in the middle of the bell section, Lissandro's trumpet has two, one a semicircular ring about halfway down the bell and the other a flatter ring one third of the way up from the bell flare. Fifth, the angularity of the bows is noteworthy. Among Nuremberg makers only the Ehe family, active between1600 and 1760, used this form.

The sound of the replica

The instrument is pitched in D at a = 465 Hz, and thus corresponds to the cornetts and recorders in the collection of the Academia Filarmonica of Verona which were made at around the same period.[12] Although it was probably used for signaling and for military purposes, the instrument is well in tune and possesses a fine clarino register. The eleventh and thirteenth partials are rather easily lipped into tune, and the instrument has a pleasant response. It could well be put to use playing music of the early Italian Baroque, such as Monteverdi and Fantini. The overall impression is that the original must have been a fine musical instrument made by a skilled, professional craftsman.

Mouthpieces

Three trumpet mouthpieces were found in the sea bed near the other trumpet parts. One of them is a cast and turned cup, which is soldered to a cylindrical tube. Its measurements are similar to those of a sackbut mouthpiece. The total length is 117 mm, the external rim measures 38.5 mm, and the internal cup diameter is 22.6 mm. The depth of the cup is 18.6 mm, and the throat, 7.8 mm. The second mouthpiece was roughly cast in lead and shaped with a hand-held knife. It looks very crude and was possibly cast on board ship to replace a lost mouthpiece. The third was more precisely cast in tin and has the same external measurements as the second; it was probably cast in the same mold. These latter two are a little smaller than the first mouthpiece, with the following measurements: length, 103 mm; rim, 35.5; and cup, 21 mm wide. The depth of the cup is between 11.5 and 13 mm and the throat, approximately 5 mm.

Evaluation of the playing characteristics of such mouthpieces is somewhat premature. However, there are many other similar trumpet mouthpieces that have been found in various other wrecks from around the world, and I am planning to write an article on them in the near future.

The following questions remain: Who was Lissandro Milanese? Can we learn anything more about his work? What was the trade link between Genoa and Amsterdam? Perhaps more work should be done in Genoa!

Author's note: I wish to express my thanks to Mr. Graham Nicholson, who so kindly helped me with the translation of this article into English.

Geert Jan van der Heide lives in the Netherlands, where he builds reproductions of early trumpets, horns, and trombones. He has conducted extensive research on the construction of early brass instruments.

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NOTES

[1] The *waggelstich* is made with a burin with a broad tip, rather like a chisel. By turning the hand from right to left continuously in a rocking motion, the engraver creates a zig-zag pattern.

[2] Don L. Smithers, *The Music and History of the Baroque Trumpet before 1721* (Carbondale, IL, 1988), Chapter Five.

[3] Don L. Smithers, lecture presented at Sweelinck Conservatorium, Amsterdam, November 1995.

[4] A. Wor, *Lyste van 't gene tot d'Equipage behorende Voor een Retourschip, Fluyt oft Jacht*. (n.d. [18th century]), p. 4.

[5] J.N. Green, *The loss of the V. O. C. Retourschip "Batavia, Western Australia, 1629.* British Archeological Reports, no. 489 (Oxford, 1989).

[6] See H. Ewe, *Schiffe auf Siegeln* (Bielefeld and Berlin, 1973), pp. 46 (for Faversham) and 200 (for Tenby).

[7] See Igino Conforzi, "Girolamo Fantini, 'Monarch of the trumpet'," *Historic Brass Society Journal* 5 (1993): 159-173.

[8] In Berlin, Musikinstrumenten-Museum des Staatliches Instituts für Musikforschung; and Leipzig, Musikinstrumenten-Museum der Karl-Marx-Universitäts.

[9] *Nova Theoria di Musica* (Parma, 1812).

[10] The author asked the divers if they had found anything like cordage or spacer blocks, but nothing of that kind had come to their attention in the vicinity of the other trumpet parts.

[11] Oxford, 1992.

[12] R. Weber and J.H. van der Meer, *Catalogo degli strumenti Musicali dell' Academia Filarmonica di Verona* (Verona, 1970), pp. 77-78.