

**WILLIAM BULL,  
MUSICAL INSTRUMENT MAKER  
(ca. 1650 - 1712)**

**Working Methods and Instruments Analysis**

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## **Background**

**W**illiam Bull has traversed the centuries with the reputation as a fine maker of brass musical instruments while at the same time remaining a somewhat enigmatic figure [1, 2]. John Grano, a renowned trumpeter associated with the composer Handel, records in his diary in 1729 that he was lent ‘*an excellent trumpet of old Bull’s making*’ [3]. This 17 years after Bull’s death.

There is evidence of his ability to play the trumpet. He was a trumpeter to the English Monarchy between 1666 and 1700. He was also a maker of musical instruments and day to day metal ware of the period such as speaking trumpets and powder flasks. He appears to have been held in high regard as a player and maker, and yet Byrne [4] posed the two crucial questions, which at present still, cannot be answered. Where did William Bull learn to play the trumpet and where did he learn to make musical instruments?

The life and works of William Bull has been well researched and published by Maurice Byrne [4, 5]. According to Byrne he was apprenticed to Mary Tibbals haberdasher gaining his freedom in 1671 [6]. When William Bull went to register his mark (Fig.1) at Goldsmiths Hall on 10 January 1689/9 he describes himself as a Free Haberdasher [7, 8].

On 2 July 1666, he was appointed Trumpeter Extraordinary [9, 10] to the newly restored King of England, Charles II (1660-1685). In 1677 he was elevated to Trumpeter in Ordinary :



Fig. 1

*“ these are to require you to swear and admit William Bull in ye place & quality of Trumpetter in Ordinary to His Majesty with fee in ye place of John Christmas deceased to enjoy the same place and with all rights profitts priveledges & advantages thereto belonging ”[11].*

The latter was a job that was based at the Tower of London. On 5 January 1700, William Bull surrendered his appointment and room at the Tower [12].

According to the Lord Chamberlains records, between 1686 and 1700, in addition to his royal duties, William Bull repaired or ‘*made new*’ some sixteen silver trumpets for the King’s trumpeters [13]. There is no evidence that William Bull received trumpets to repair or remake from the Royal household after he retired from service in 1700. In each case, when an instrument was sent for repair the weight of the silver was noted so that at least the same weight of instrument was returned [9,10]. At this time, the weight of silver was expressed in ounces (oz) and pennyweights (dwt) [8]. An example of an entry from the Lord Chamberlains records for 1688 reads [14]:

*« April the 24<sup>th</sup> received m Will Shore’s trumpett and delivered it at ye same tyme to Mr Bull to be new made it being poir 30 oz 1dwt Wm Bull »* [ his signature] [see Fig.1]

[ In the left margin]

*« Mr Shore’s trumpett to be mended. This returned May ye 14<sup>th</sup> 1688 ».*

The Lord Chamberlains records do not mention anything other than silver trumpets being provided for the King or that the trumpeters played on anything else but silver trumpets.

Apart from his position at the tower, William Bull also maintained a family home and workshop outside the Tower of London. Byrne has identified his locations from being close to the Tower in 1673, to the newly developed ‘*west end*’ of London at the Haymarket in 1681 and to Hunts Court off Castle Street, close to St Martins in the Fields Church in 1700 [4].

His movements are of interest in identifying the possible location of his shops and workshops, and also for the little information that can be gleaned from his change of address advertisements. Three newspaper advertisements refer to his working in silver and brass. The London Gazette of 18 March 1677/8 informs

all those who have ‘*occasion for any trumpets of silver or brass*’ and on 7 March 1681/2 No. 125 the Loyal protestant and True Domestic Intelligencer announced that ‘*all Gentlemen may be furnished with trumpets, French Horns, speaking trumpets and Flasks of all sorts both silver and brass*’ [4]. The Post Boy on 18 June 1700 also referred to the fact that Bull could supply ‘*Hunting Horns and Trumpets, both silver and brass*’.

## The Instruments

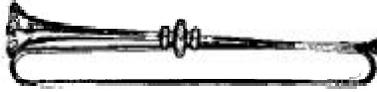
There are only three surviving specimens from William Bull’s workshop.

- A copper alloy Horn in the collection of the Horniman Museum, London the garland inscribed and dated. ‘*WILLIAM BULL LONDINI FECIT 1699*’ (Fig.2). This instrument forms part of the Adam Carse collection of wind instruments which was donated to the Horniman Museum in 1947. (Mus.No:14.5.47/307) The instrument was lent to the International Music Exhibition in 1900 by the Rev. Canon Galpin and it is known that Carse bought the instrument in a sale in 1946 [15, 16, 17].
- A copper alloy trumpet in the collections of the Museum of London, inscribed but not dated on the garland ‘*WILLIAM BULL LONDINI FECIT*’ [ see Fig.3]. The history of this trumpet can be traced back to 1872 when it was exhibited in The South Kensington Exhibition and was the property of Thomas Harper, a leading trumpeter in the nineteenth century [18, 19]. The instrument was donated to the then London Museum, now Museum of London, in 1921 by A.Hill Esq. (Mus.No: A23580) [2, 20] ;



Fig. 2

Fig. 3



- Two silver trumpets. One was in a private collection, but is now in the collections of the Warwickshire County Museum Service, England, also inscribed but not dated ‘*WILLIAM BULL LONDINI FECIT*’ [2]. The other is inscribed but not dated and is in the collections of the Ashmolean Museum, Oxford, England [32].

The evidence for the nature of William Bull’s knowledge of the metal he was using remains solely with these three instruments, the Lord Chamberlains records, his trade advertisements, and with the discovery by Anthony Baines of a manuscript by James Talbot, which can be dated to between 1685 and 1701 [1].

### **Instruments of Silver**

There is substantial evidence of Bull’s ability to work in silver. The Lord Chamberlain’s records show that Bull was only working with trumpets for the Royal Household [21]. The information indicates that Bull has a workshop where he is melting down and re-working the silver into instruments [1, 2, 22]. At least 10 of the instruments Bull received from the royal household were *brokk to pieces* and to be *new made*. Occasionally with instructions to make up the weight of the silver, as with Mr Brooks trumpet, which was 11 oz short and to be new made up to 36 oz [23]. William Bull’s advertisements also refer to silver working.

Halfpenny in his unique position of having been able to examine the Warwick Museum silver trumpet when it was in private hands comments on its method of manufacture. An important factor being that the trumpet appears not to have been completed and as such, it was possible to see features of the instrument not normally visible. In his comparison of the trumpets by William Bull [2], he describes the silver trumpet as being of solid silver including the mouthpiece. The garnishes embossed and spun, while the silver fittings on the Museum of London trumpet are stamped sheet silver, wrapped around a tube and soldered on. The bell was turned on a mandrel and he noted that it was still possible to see ‘*the puckers or pleats within the mouth where they had not been completely buffed out in the finishing*’. It has not been possible to include

analysis of the silver trumpets as part of this study of William Bull's surviving instruments.

### Instruments of Copper alloy

William Bull's advertisements refer to brass working, and his trade card (Fig.4) of 1700 depicts a trumpet of the same style as the one in the Museum of London and a horn similar to the one in the Horniman Museum. However, his instruments and the Talbot papers are the only evidence of his copper working abilities.

Brought to Anthony Baines attention the Talbot papers are a unique collection of documents relating to musical instrument makers of his day. Accumulated by James Talbot, who at the time was Regius Professor of Hebrew in Cambridge, England (1689-1704), the documents consist of uncollated papers accompanied by fragmentary jottings [1].

It is not known why Talbot was collecting the information, but he made detailed measurements of the musical instruments, and amongst other things made notes on their form and material. The description of two trumpets in the Talbot manuscript can be linked to William Bull. Some of Talbot's notes can be attributed to William Bull, but others are obviously a summary of methods that were current at the time. The notes transcribed below follow the seventeenth century spelling and format of the entries. The original handwriting is at times difficult to read (shown in square brackets], words are abbreviated, words are

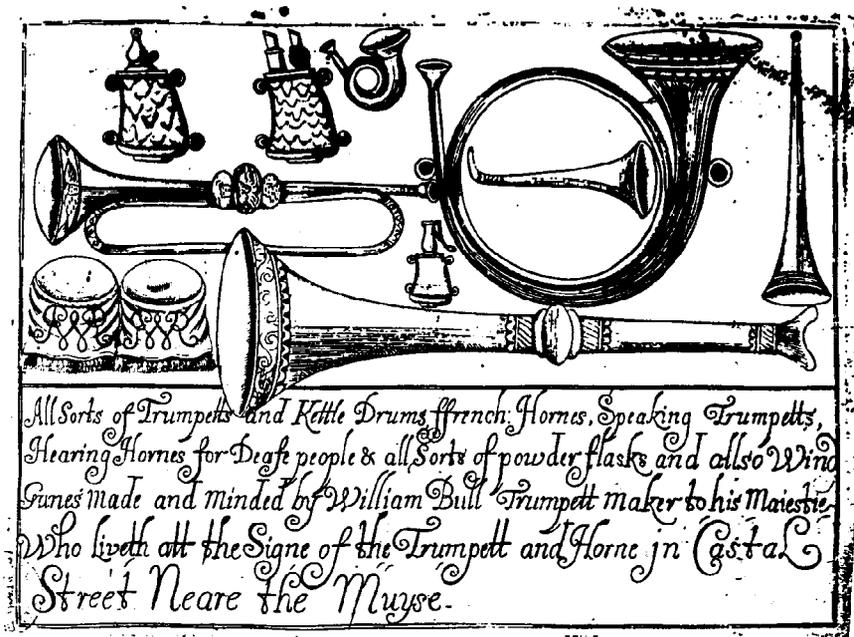


Fig. 4

inserted over other words, and there is much crossed out and blotted with ink; typical of the effect of a quill pen. Abbreviated words have been transcribed in full, but the grammar and punctuation is Talbot's. The measurements of the metal wind instruments are not included here as they are already partly published by Baines [1]. They also form part of a project by Darryl Martin of Edinburgh University who, commissioned by the Galpin Society, aims to faithfully transcribe the complete set of documents alongside the originals [24].

Of interest to this research is the notes on the manufacture of the instruments. The terminology for the parts of the instruments has changed over the years and has been clarified by Barclay and reproduced here (Fig.5) [25].

Transcription of parts of Talbot's papers [26]:

« *Bull's Copper Trumpet* »

[this heading followed by measurements and then]

« *Yards & Pavillions turned on a rod [From] Boss after Garnish [?] in middle of Pavillion: Garnishes over every joynt* »

[ more measurements and then]

« *1<sup>st</sup> Yard runs through right side of boss [?]* »

« *Best mettal Bastard-Brass mixed part solid brass.*

*Worst silver, & worst copper springy.*

*[Great end] of pavillion must be thicker for raising. [Mfr ] of yds drawn as wire through Iron full of holes. [as] wire in [ ? ]:*

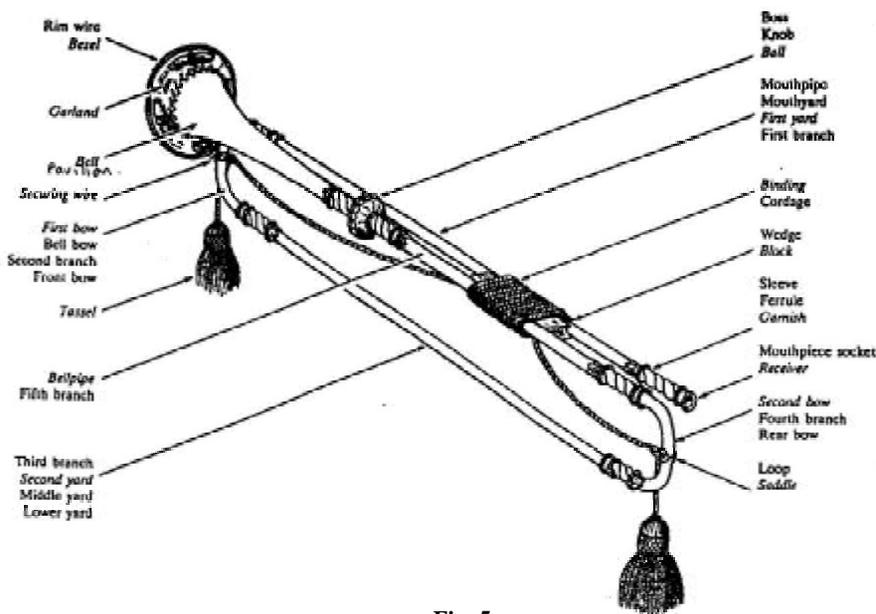


Fig. 5.

*Garland put on to strengthen pavillion. Garnish placed at ye Mouthpiece. Bull ».*

Talbot ends the above piece with Bull's name and this has to be taken as information coming directly from Bull. The cryptic notes which one can only surmise were to be written up into a more formal manner show that Bull was carrying out techniques which were standard at the time. The manufacturing methods are further embellished on Page 9 of the papers. This page consists of jottings set out in two columns, the one side probably referring to the other. Although not directly attributable to Bull, the notes on materials and form were standard processes at the time.

In the left hand column:

*« Tis made usually of pipe brass [inserted over [Laton]] which is a mixture of Copper & a yellow mineral called Calamine [Cadmia inserted above Calamine] this thought ye best by reason its firm malleable durable & cheap: tho some are made of Iron Tin, Wood, [?] (glass) silver , [brighter], gold (Mess.1.Gall.5.pr.11) »*

in the right hand column

*« The yards may be taken asunder at ye joynts B F. ECD to make ye instrument more portable, [viz] and [made ye] small pieces because tis hard to find pieces of [Laton] so large [enough] to make ye [instr] entire ye instrument being usually about 7 foot long ye joynts are hid by ye knobs BCD EF. [?] neither could ye Branches be crooked if entire: ye mettall is usually hammered into plates of ye form of Parallelogram & rounded into a cylinder ( of which [?] in ye brazing) joynted [with] solder. [?] »*

This description of the metal, accompanying the information on Bull's Copper Trumpet, gives an interesting insight into Bull's knowledge of the alloys he was using.

The word '*Bastard*' suggests that the metal is impure in some way possibly as recycled brass, which if mixed with good brass would still be easier to work than as he suggests '*worse silver & worst copper springy*'. Halfpenny [2] considers that Bull was alluding to the unsatisfactory behaviour of silver when spinning out bell sections when he told Talbot that this material was worse (and copper springy worst), and that the mix of bastard brass and solid brass was better for instruments. Diderot writing in the mid 18<sup>th</sup> century says that a certain quantity of melted scrap brass was added to the cementation mix, and the most desirable resultant alloy consisted of 28 % zinc, 1 % impurities and the

rest copper [27]. Bates also provides information that '*traditionally Bastard Brass was an alloy prepared by melting together scrap brass with new copper but no calamine, i.e. a very copper rich brass*' [18]. However, Barclay [25] has encountered a sixteenth century reference to the term 'bastard' being used to describe zinc. Paracelsus refers to zinc by the name '*A bastard of copper*'.

The general habit, even today, of calling copper and its alloys by inappropriate names has to be taken into consideration. The words brass and bronze have been used indiscriminately and, as will be revealed later, Bull may even have used the term brass to indicate a bronze. Alloys containing zinc were often referred to as '*Latten*' [28,29]. Talbot makes a point of using the '*Laton*' and gives a specific recipe for brass. The word bronze for an alloy of copper and tin was not current until the eighteenth century.

However, although Bull himself refers to making '*brass*' instruments the nomenclature is unclear, and his two surviving instruments are very different in composition.

The Horn belonging to the Horniman Museum is a high copper Horn with small amount of zinc and lead. The Museum of London Trumpet is made of bronze.

## **Analytical Method**

To identify the different components, on both instruments, non-destructive analysis was carried out using Energy Dispersive X-Ray Fluorescence (XRF, or sometimes commonly called EDAX). This method of analysis was selected because, at present, it is the only system that allows a whole instrument to be placed in front of the source. All other methods require a sample of the alloy. The results are comparative rather than absolute and are set against known calibration standards. Much time therefore is spent setting up the standards and calibrating the equipment. The method can be described as qualitative, and can be measured quantitatively or semi quantitatively depending on the XRF equipment employed and the method required for analysing the data. The examination is of the surface only. Results are improved if the surface under inspection is uniform and with musical instruments, one has to be aware of the possible effect of the curvature of bells and tubes and any surface deterioration. The focus of the X-Ray source can include an area of ca. 10mm and penetrates to a depth of 1-2 microns.

### **Horniman Museum Horn (Fig.2)**

Dated on the garland to 1699, this Horn by William Bull is one of the earliest pieces in the Horniman collection. Of great interest has always been the artificial

lengthening of the back bow or main tube to the Horn by the insertion of two sleeve joints or collars. There has been much discussion over the reason for this intrusion into the instrument and whether the bell and coils actually belong together at all. [16,30,31]

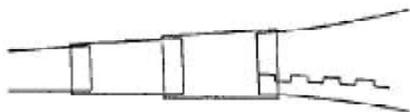


Fig. 6.

Examination with a video endoscope shows that the end of the bell and the end of the corresponding part of the main tube have been deliberately cut clean and then the narrower sleeve fitted over the main tube. The wider sleeve joint fits over both the narrower sleeve and the bell end.

The sleeves are then held together onto the bell and tubes with solder (Fig.6)

X-Radiography also shows details of the structure of the Horn, although the lead in the solder around the sleeve joints masks the union of those particular pieces.

The analysis was carried out at the Royal Armouries, London using a Kevex XRF energy dispersive spectrometer. The results are qualitative and quantitative and normalised to 100% (Table 1).

The analysis shows that the bell and tube and the sleeves are of high copper content with little zinc and lead in the mix. The solder to the wider sleeve is made up of lead and tin with a large amount of antimony. The garland and the mouthpiece receiver are both of very similar composition brasses, although the mouthpiece receiver has always been considered not original [30]. The inscription and date are on the brass garland to the instrument. Although the garland to

| Part of Instrument                   | Cu %  | Zn %  | Pb %  | Sn %  | Sb % |
|--------------------------------------|-------|-------|-------|-------|------|
| <i>Bell</i>                          | 99.36 | 0.23  | 0.41  |       |      |
| <i>Tube</i>                          | 99.20 | 0.26  | 0.54  |       |      |
| <i>Narrow sleeve joint</i>           | 99.25 | 0.24  | 0.51  |       |      |
| <i>Wider sleeve joint</i>            | 99.09 | 0.25  | 0.14  |       |      |
| <i>Garland</i>                       | 73.66 | 23.85 | 2.99  |       |      |
| <i>Mouthpiece receiver</i>           | 73.87 | 23.86 | 2.27  |       |      |
| <i>Solder to wider sleeve joint</i>  |       |       | 51.98 | 46.91 | 1.12 |
| <i>Solder to mouthpiece receiver</i> |       |       | 52.40 | 47.60 |      |
| <i>Stay</i>                          | 69.96 | 29.33 | 0.70  |       |      |

Table 1

the Museum of London trumpet is of silver, the form of the lettering and design is very similar.

The analysis suggests that various parts are contemporary with each other, all of which could fit into a seven teenth century context. However, the solder to the sleeves suggests a more modern intervention or repair.

### The Museum of London Trumpet (Fig.3)

The Museum of London Trumpet has been variously described as being of brass [2, 18], but analysis shows that it is made of bronze with a silver garland and silver garnishes.

The analysis was carried out at the Victoria & Albert Museum, using Spectrace Instruments at 50 kV. The results are semi-quantitative.

The results from the bell (Fig. 7) and second yard indicate quantities of copper and tin, a small amount of lead, and no zinc. Analysis of the garland and ferrule indicates silver.

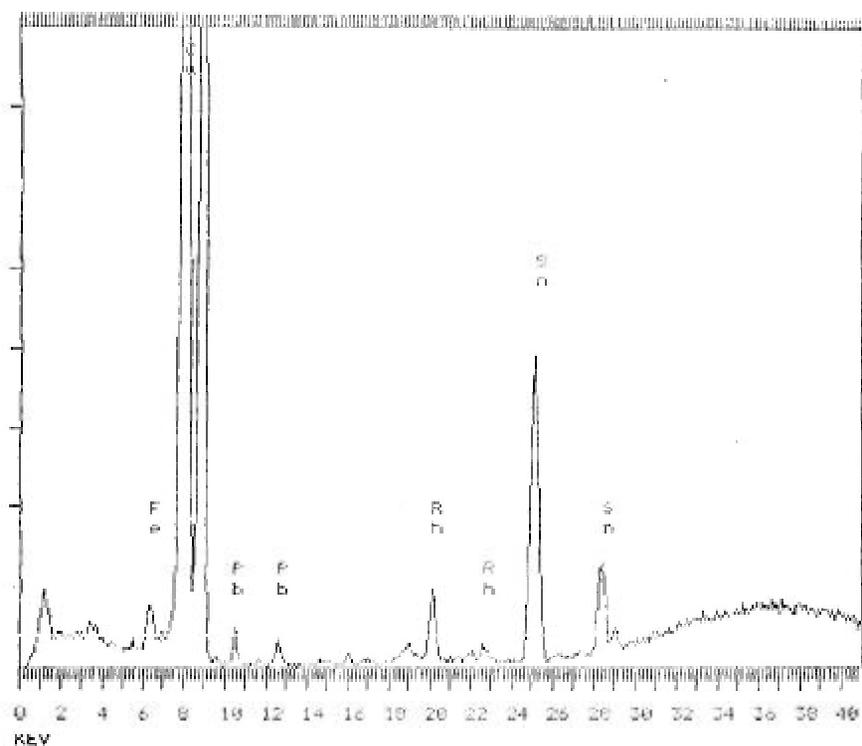


Fig. 7

The unexpected discovery that the Museum of London trumpet is made of bronze and not of brass or copper is fuel for discussion. At this stage, it is too early in the research to put any interpretation on the data. Further work with X-radiography and non-destructive analysis will clarify some areas of concern and further research into the antecedents of the instrument may shed more light. As with the Horniman Horn, the inscription is on the garland not the main body of the piece.

### **The Way Forward**

There appears to be little evidence for William Bull's copper working techniques. The confusion in terminology of the period, whether brass could also indicate bronze, as well as refer to copper makes it difficult to conclude that bronze was within Bull's remit, although certainly within his skills. The items shown on his trade card (Fig. 4) could equally be made of bronze as silver or brass. The Horniman Horn is a high copper alloy with very little zinc, at this stage not really equating to the '*Bastard Brass theories*'.

Work will be continuing on these instruments as part of research towards a PhD with University College, London. The research is based around a systematic study on a series of musical instruments, which include the instruments by William Bull, using standardised non-destructive analytical methods. This aim of this preliminary report was to summarise the information known about William Bull's working methods and to put the results of the analysis into the professional domain for open discussion.

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### **RÉSUMÉ**

#### **Bull, facteur d'instrument (ca 1650-1712)**

***Un résumé de ses méthodes de travail avec un rapport sur les analyses non destructives de ses instruments par fluorescence X***

*La collection d'instruments de musique du Horniman Museum, à la fois riche et variée, comprend un cor en cuivre de William Bull à Londres. Daté 1699, il a été l'objet de nombreuses spéculations en raison du prolongement inhabituel de son pavillon par deux colliers tubulaires. En dehors de l'étude menée par les auteurs en ce qui concerne les caractéristiques métallurgiques du cuivre utilisé dans les instruments anciens, le cor de W. Bull, ainsi que la trompette du même facteur conservée au Museum of London, ont été l'objet d'analyses non destructives. Cette communication présente les résultats de cette recherche et les théories qui en découlent concernant leur composition.*