

CHAPTER 3: ETRUSCAN AND ROMAN INSTRUMENTS

Around 500BC, a great creative explosion of experimentation in instrument morphology took place and a break was made with the old trumpet/horn tradition that had dominated the world of PVAs prior to this date (See Chapter 2)¹¹⁵. This wholesale break with the tradition probably resulted from a combination of technological ability to form the instruments, the growth of awareness that powers vested in the old forms did not evaporate when their morphology was varied and that, organologically speaking, they could perform just as well as the old forms. Added to this may well have been the demystification of the instruments used and the separation of roles such as "music producer" and "voice of the gods." Thus, freed from old constraints, the way was open for experimentation in morphological form. With the Etruscans, a whole series of instruments appear and, if the apparent continuity of tradition between their tuba and that of Anatolia and further East is indeed real, then the source of their suite of instruments seems to have been from this area. Whether or not the instruments were actually developed prior to the arrival of population in Northern Italy is a moot point but the inspiration certainly appears to have circumvented the Greek world and to have rejected the narrow Greek instrumental usage of the Salpinx. The possibility of the Carnyx having developed in the area at this time is discussed in Chapter 6.

It is possible, of course, that the great explosion in instrument types is more apparent than real. It could well result from an increase in the practice of representing instruments on paintings, reliefs and bronze-work, thus bringing to light instruments that had previously existed for some considerable period. Perhaps also, taboos had been removed allowing such representations to be made, as the secularisation mentioned above took place. Just as possible too, is the increase in technological ability of the peoples in this area, allowing freer rein to the design and removing constraints formerly placed upon them. Whatever the answer, it seems hard to ignore the increase of knowledge of instruments at the time and reasonable to attribute it to the development of new instrument types.

Last but not least, is the possibility of a great expansion of interest in things musical at this time. Perhaps more specifically, this interest was in PVAs in particular as no corresponding rise in the number of instrument types seems to have occurred with other instrument groups. Such an awakening interest in PVAs could well have arisen from the realisation of the potential of such instruments when a fully-fledged mouthpiece, with cup and throat were applied. Thus, old forms could be rejuvenated and, with the acoustic characteristics of the mouthpiece, impressed upon that of the instrument cavity, become

¹¹⁵ While this statement might have been a little speculative at the time it was written, I now, wholeheartedly agree with it, following years of further work in this area.

new instruments. Certainly in the 19th century a similar phenomenon occurred with the invention of valves and, for almost a century after this crucial stage, enormous experimentation took place until the modern pattern of instruments emerged.

The Etruscans inhabited North-Western Italy, off the Eastern part of the Tyrrhenian Sea from about 1600BC onwards, while the Southern part of Italy was populated by other Italic peoples. About 760BC a Greek colony of Kyme (Latin Cumae) was established west of present-day Naples, to oscillate over the succeeding years between the Etruscans and the Greeks. By 480BC much of the coastal area of the southern toe of Italy was colonised and fell under Greek influence. It is, thus, impossible to be absolutely certain about the cultural provenance of material that is found along the Southern coast of Italy at this time and the use of the term Etruscan should perhaps be read widely as "West-Coast Italics and Etruscans."

About ten instruments or varieties of instruments are in this area at this time, five of them appearing here for the first time-

- i) Ivory horn
- ii) Short animal shaped horn
- iii) Clay horn
- iv) Short conical instrument with upturned bell
- v) Tuba
- vi) Curved tuba
- vii) Side blown salpinx
- viii)

Three other instruments either continued to be used by the Romans or led to instruments which the Romans used. With these, the Etruscan and Roman usage is considered as a continuous narrative for each instrument in turn. The instruments are:-

- ix) Large highly curved horn
- x) Lituus
- xi) Cornu

i) THE ETRUSCAN IVORY HORNS

These are known only from two finds SD256 from Populonia, (South of Pisa) and SD275 from Prenestina. Both of these are fragmentary but, according to Ducati¹¹⁶ they are in the form of a large diameter gently curving horn with gold fittings. These fittings are made of thin gold sheet decorated with chased scenes of animals and form a band around the mouthpiece and bell end along with two similarly decorated ring mounts. The mouthsupport is slightly elliptical with maximum dimensions of 9 and 10 mm. According to Minto¹¹⁷, (1943, Plate 130), the decoration is of a Graeco-Asiatic school (Greco-asiatico)

¹¹⁶ Ducati, 1927, 172, Tav. 58.

¹¹⁷ Minto, 1943, pl. 130.

and contains elements of decoration from Egypt, Assyria and Mycenae along with representations of the flora and fauna from these areas.

There seems little doubt, therefore, about the source of inspiration for the decoration of this instrument and the presence of this on the horn clearly suggests an origin from Asia. No evidence for the use of these instruments exists other than these two extant specimens but the source of the material was most probably eastern. The instruments may, thus, have come directly from Asia with their connection with Greece being one of trading only.

Regardless of how they were used, they were clearly very exotic, the combination of gold and ivory pointing to their having great value to their owner. Their generally-large diameter would limit their playable range to one or, at most, two notes and thus preclude any form of "musical" use.

ii) SHORT ANIMAL HORN FORM

The use of this instrument has been discussed in Chapter 2, IC 145 from Este having been considered. However, a small cast (?) instrument was also found at Populonia, SD257¹¹⁸. It is 400mm long and in the form of a gently curving animal horn with a taper opening out slowly to a circular bell, diameter 45mm. At its tip is a conical mouthpiece with a rim of about 27mm (scaled) and immediately below the mouthpiece the tube scales at 12 mm. Thus, the throat of this mouthpiece could be in the range 4-9mm, (allowing for a range of wall thicknesses from 2-4mm) and it would produce a considerable bore constriction, (Figure 3.1)

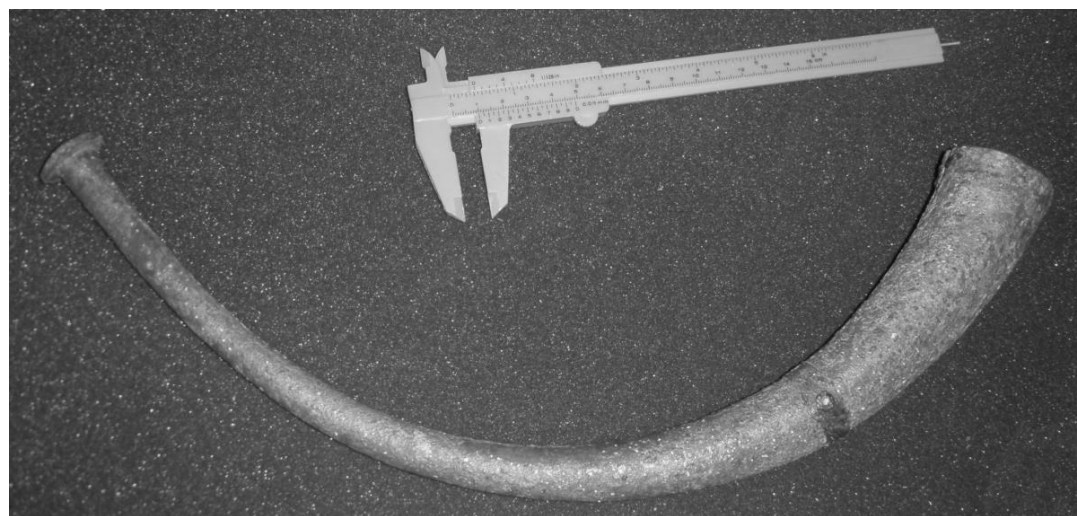


Figure 3.1: The Populonia Horn

This instrument appears to be a well-designed analogue of an animal horn with the manufactured mouthpiece added. No other such instrument has been found in this study and, in this area it represents the first definite proof that the natural animal-horn instrument was refined by being made in metal and also, presumably raised to the status of an instrument proper.¹¹⁹

¹¹⁸ Minto, 1945, 45, Tav. XI.

¹¹⁹ In recent years, I have had the opportunity to study this horn and the above description is in need of considerable refinement.

iii) CLAY HORNS

The one instrument of this type is also an analogue of an animal horn, although made in clay. It was found in the Po valley area of Italy in deposits of the Terremaren culture¹²⁰. It is 430mm long, with a thick wall and lacks a mouthpiece. The tube end is cut off obliquely leaving the instrument difficult to blow. Thus, according to Behn, only the fundamental tone can be played with reasonable ease, the second formant being elicited only with the greatest difficulty.

iv) SHORT CONICAL INSTRUMENTS WITH UPTURNED BELL

Only two references to this instrument occur one of these, (IC24) being on a scene on a situla from North eastern Italy which is dated between the fifth and fourth century BC. It is cited in Behn¹²¹ who gives no further information about its provenance (see plate 3.1a, below).

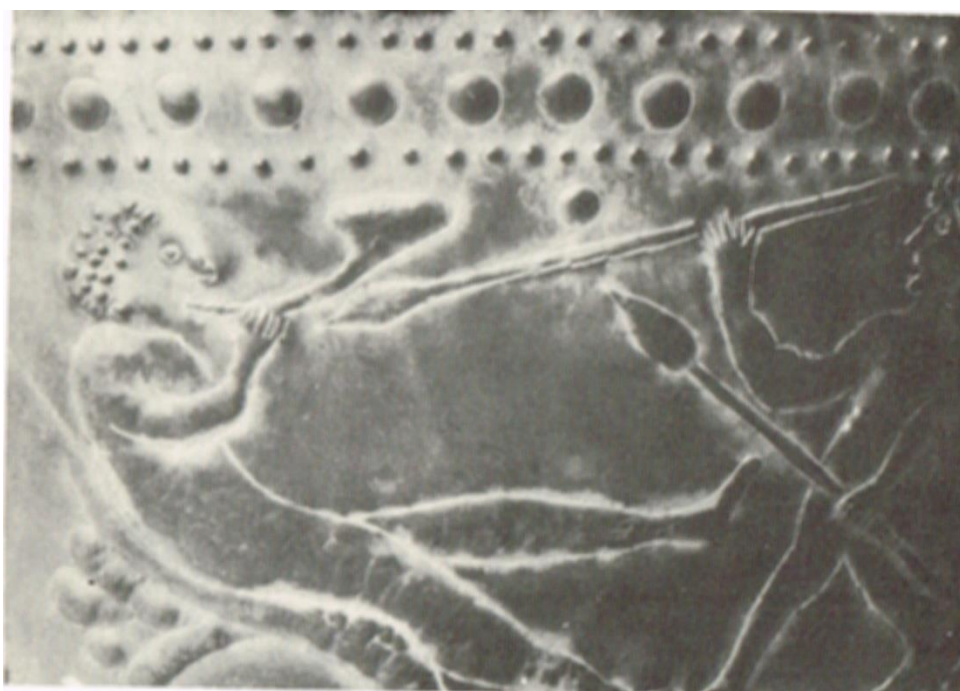


Plate 3.1a: A Short Conical Instrument with Upturned Bell

The representation shows a short tapering instrument with a bell which opens out rapidly into a conical bell end with a certain amount of flare. In form it resembles nothing else from this area, the closest analogy perhaps being with the Egyptian instruments, this being a form of these with a curved tube and bell yard. Similarly it could be said to be related to the Greek salpinx although on the Italian instrument, the tube yard is both shorter and more conical than the salpinx references seen. In addition, this area was not subjected to the Greek influences felt in the Southern part of Italy.

Behn¹²² considers this to be an Etruscan Lituus but this seems unlikely as the early form of this instrument used by both Etruscans and Romans had a long parallel tube yard with a sharply recurving bell. (See Chapter 6, Figure 6.3) This instrument may well have been

¹²⁰ Behn, 1954, 127.

¹²¹ Behn, 1954, 129, Abb. 160.

¹²² Behn, 1954, p. 129.

the result of a low level of design diffusion from another area combined with the local drive to develop the new range of instruments that appear here.

One other representation similar to this exists in the form of a small bronze figure of a trumpeter, dating from the first century BC and found at Hradiste in Moravia. This statue is of a figure holding a conical horn whose bell end turns through a right angle and appears to have a flared end. It is difficult to scale the instrument from the available photograph but it appears to be about 550mm long with a bell diameter of about 120 mm. Unlike the instrument discussed above, however, (IC24) its curvature is mainly over the central part of the instrument, whereas IC24 has its curved portion immediately below the bell itself - much like the Celtic Litui. (See Chapter 6, Figure 6.3).

On the uses to which this instrument was put one can say little with confidence. That is, other than either the tonal qualities of the instrument or the performance of the gentleman in IC24 is not too good as he appears about to receive the judgement of a critic!

Several hundred years later, the Sassanians produced a somewhat similar instrument which is illustrated on a relief from Tak-i-Bostan. (IC35)¹²³. This instrument too, has a curved, apparently slightly conical tube yard, which is considerably longer than IC24, its conical bell turning through 90°. (Figure 3.2)

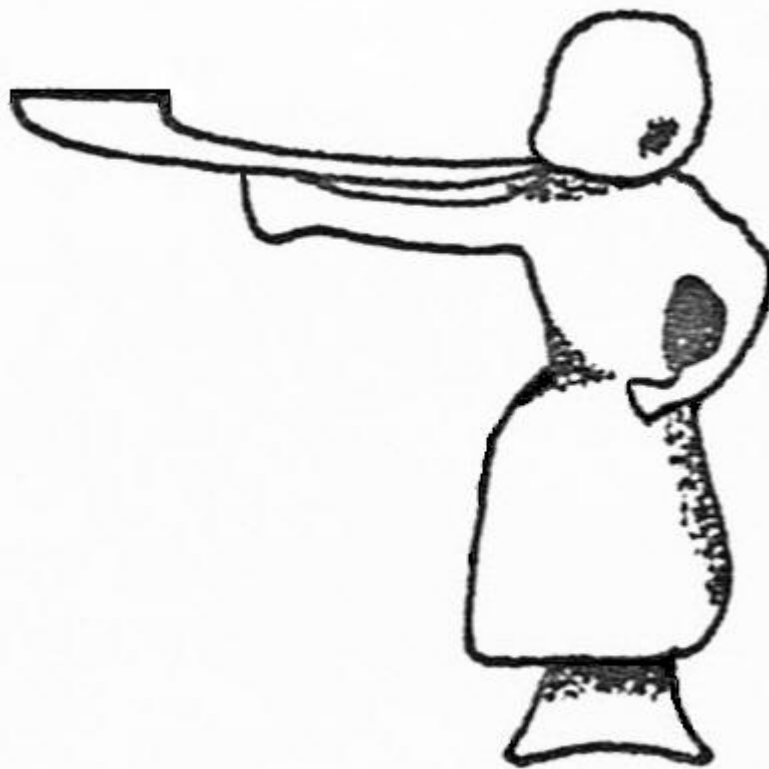


Figure 3.2

It is not possible to relate these two instruments with certainty but the Etruscan instrument may, in some way have been a forerunner of the Sassanian one

¹²³ Behn, 1954, Abb. 107.

v) THE TUBA

This has been discussed in Chapter 2.

vi) THE CURVED TUBA

Instruments of this type are produced by nature in the form of animal horns on species such as the eland and the oryx. It is not possible, therefore, from iconographic material, to tell whether illustrations depict natural or man-made material. Thus, on IC76, where a form of curved horn is being blown, this may be of horn or metal¹²⁴. Behn, who cites this, gives no other information other than it is from "einer unteritalischen Vase" (a lower Italian vase) but the dress of the player is somewhat Greek in appearance suggesting an origin from Southern Italy. (Figure 5.3)



Figure 3.3

No other illustrations of this instrument are found in this area although similar ones do appear somewhat later on Sassanian silverware, eq. IC21.¹²⁵

vii) THE SIDE-BLOWN SALPINX

Only one example of this instrument exists, SR2, now in the British Museum. It is shown on a small statue of a trumpet player, found near Naples and dated to about 470BC. The player holds the instrument to his left, blowing through what must have been an aperture on the tube which appears quite parallel. At the bell end of the instrument the tube opens out to a larger diameter following a short tapered portion.

¹²⁴ Behn, 1954, Abb. 153.

¹²⁵ Dalton, 1964, pl. XXXVIII.

This is the earliest representation of a side-blown instrument in the Mediterranean world and it is interesting that it appears in this area where experimentation in mouthpiece design seems to have been carried out. Instruments of the salpinx type have a very slender tube yard and, when lacking a mouthpiece present a small diameter to the lips and create a severe problem of embouchure. One way of overcoming this problem is to terminate the tube obliquely, thus presenting an oval shape to the lips which they can accommodate more easily. (Figure 3.4) However, the obliquely cut instrument end requires the player to hold the instrument at an angle pointing both to his front and to the side. A further method of providing a blowing aperture shown in Figure 3.4b is to cut out a section of tube wall. With such an aperture the tube can be held directly across the mouth, pointing to the right or left, the major axis of the oval mouthpiece lying in the same direction as the axis of the lips. (See Chapter 5, for further discussion of blowing apertures.)

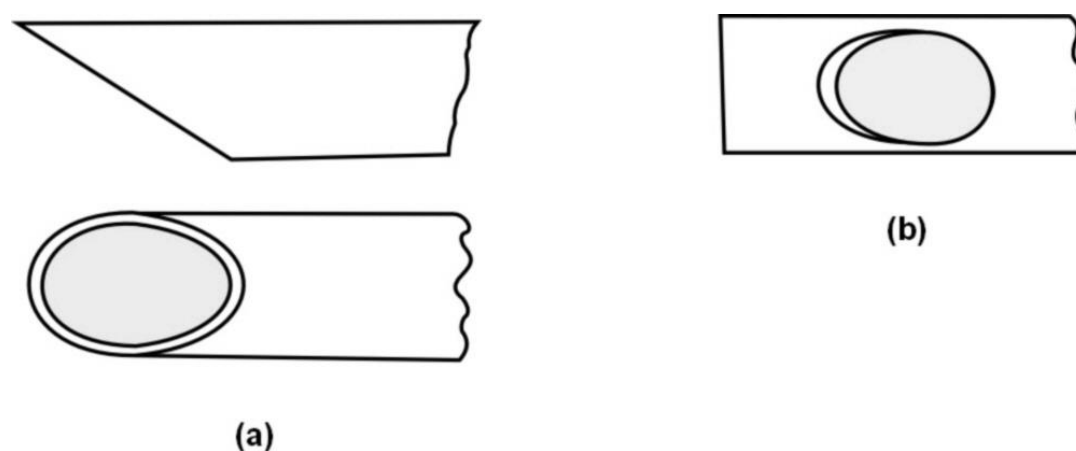


Figure 3.4: Blowing Apertures

Whatever steps are taken to provide a blowing aperture on a thin-walled tube, however, no effective throat can be provided. Thus, this instrument would be severely restricted in its range by this feature and would most likely be superseded by instruments with mouthpieces proper, when they were introduced or developed in this area. This suggests that this area, Campania, awaited the development around 470BC.

The further significance of this particular instrument as a pre-cursor to the carnyx is discussed in Chapter 6.

viii) THE LARGE HIGHLY-CURVED HORN

Only one representation of this instrument exists, IC153, Figure 3.3 and this is separated from (ii) Animal-shaped horn because of its seminal position in the development of both the Lituus and the Cornu. This illustration shows a player blowing a large highly curved horn, It scales at 810mm. long with a bell diameter of over 150mm and appears to be curved in one plane only. Horns of such a size are rarely found in nature and this representation is, therefore, quite likely to be of a metal horn analogue.

The significant difference between this instrument and SD257 the small horn from Populonia, lies in its curvature and its diameter. Both these tend to suggest manufacture from sheet rather than by casting and in the production of such a sheet metal instrument the maker would have carried out the more difficult of the processes involved in making

either a lituus or a cornu. Varro, (DR183) writing in the first century BC wrote that "The cornua now made of bronze ("ex aere") were formerly made from horns of the wild ox."

The Lituus

With several Roman instruments, a difficulty lies in identifying instruments referred to in documentary material. This is no problem in the case of the lituus, however, as several authors have described in terms that are quite unambiguous. Cicero, for instance, (DR8) traces the parallelism of the term "Lituus" as an instrument, with its use to describe the staff of augural office, "a wand which was crooked and at the top slightly curved." This wand, he claimed took its name from the instrument on account of this likeness. Seneca, in DR18, contrasts the "cornu reflexum" (turned about) with the lituus which is "adunco aere" (of bronze bent in the manner of a hook). In addition IC71, a gravestone of Iulius Victor "ex collegio liticinum cornicum" depicts him with both a lituus and a cornu.

Although the lituus is frequently mentioned in contemporary literature, (29 references in this study) it is not as frequently represented as the other instruments. Of these few representations, however, two give a fairly clear idea of the derivation of this instrument. On one of these, IC11, its form is seen to be of a roughly parallel tube with a strongly recurving bell, to which are attached cords or straps. Thus, this instrument appears to be the simplest metal analogue of a reed or similar tube yard plus an animal horn bell. (Figure 6.3) Clearly, the biggest technical problem in constructing such an assembly lies in achieving a joint between the yards that has mechanical integrity and seals sufficiently well to allow the instrument to be blown satisfactorily. This problem is exacerbated on an instrument such as the lituus where a turning moment on the bell can readily cause this joint to fail.

An illustration in Collaer's book¹²⁶ shows the solution adopted on these horns from Bolivia, where the same problem of attaching horns to tubes has been tackled. On these instruments, a cord can be seen that feeds through the bell and is, presumably, threaded through a hole in the bell and tube. This cord holds the horn and tube firmly in a fixed relationship, allowing any residual gap to be plugged using wax, resin or clay. A similar such cord is visible on IC11 although it may not feed through the cavity of the bell itself and perhaps simply passes across from bell to tube yard. IC71, a later Roman representation shows cords looped between the bell and tube yards. (Figure 3.5) It is clear from this looping of the cords, that they no longer perform any structural function but remain as purely vestigial features.

Four iconographic references, IC2, 6, 11 and 73 date from the 4th century BC, the oldest of these, IC11 being dated to 490-470BC. The second of these, IC6, from the Tomba dei Relievi at Caere¹²⁷ depicts an instrument very similar to the two instruments SD212 and 231 found at Caere which have a possible date of late fourth century BC. These are made up of a parallel tube yard 1.20m long and about 20mm diameter which is attached to a bell yard of 400mm length which opens out to about 80mm diameter. This bell yard is

¹²⁶ Collaer, 1975, Pl. 5-50(b), p.297.

¹²⁷ Giglioli, 1935, Tav. CCXLII/III and Ducati, 1927, 394.

fabricated from sheet and a sleeve is fixed over the joint between the yards. (See Chapter 6, Figure 6.3). According to Fleischhauer¹²⁸, this instrument is in G and currently sounds its 2nd to 8th formants when blown.

Measuring over a metre in length and only 20mm or so in diameter, this tube yard would be extremely difficult to manufacture. Both forming of the tube into a circular cross-section and its sealing by whatever means were used would be a difficult operation. It is obvious therefore, that the considerable length of the tube yard was a deliberate design feature presumably having been intended to increase the range of useful notes that the instrument could produce. There is, on the extant instrument, no evidence of mouthpieces having been used and the evidence from IC16 tends to re-enforce the view that they were not used on these instruments.¹²⁹

On this reference, a sarcophagus relief from Amiternum, dating to the first century BC, a Lituus player is seen in a funeral procession along with two cornu players and several other musicians. The lituus player, however, while blowing an instrument which scales at 1.45m long and is of a typical lituus form, plays it as a side-blown instrument. While, according to Ryberg¹³⁰, “the scaling and illusionistic relief of this sculpture lack the sophistication achieved in the Augustan period that followed the Late Republic”, there is little doubt about the way this instrument is being blown. The lituus player is clearly seen full face with the instrument pointing to his left, while the two cornu players who follow him are seen in profile with their instruments angled and resting on their shoulders. Beneath these players is a row of four aulos/tibia players, the rear three of these being seen in profile with the two pipes held before them, only the right arm being clearly seen. However, the fourth player, the one at the front of the procession is quite clearly seen full face, at right-angles to the other players. Both his pipes are seen down across his chest and his arms held out to either side. In addition to this, on the largest photograph of this scene, in Masson¹³¹, the 50mm or so protrusion of the tip end of the tube yard past the player's lips can be seen, (Plate 7.1)

Thus, a reasonable conclusion is that the lituus player is accurately portrayed and is, in fact, blowing a side-blown instrument. As discussed above, a lateral blowing aperture provides advantages over a small tube end diameter but not over a conventional mouthpiece. With the appearance of this side-blown instrument of about 100BC, therefore, it would seem that the lituus of this period was not provided with a mouthpiece.¹³²

The Roman Lituus

Only one iconographic reference to the Lituus found in this study is clearly of Roman origin, IC71. This is a carving on the gravestone of M. Iulius Victor "ex collegio liticinum cornicinum" and shows the cornicen holding a lituus and a cornu. It was illustrated in 1677 by Casp. Bartholinus, although the illustration is very small. After this,

¹²⁸ Fleischhauer, 1960, 501.

¹²⁹ This instrument has since been examined by the author and is described in Holmes 2010, 134ff, Figures 46, 47, 48.

¹³⁰ Ryberg, 1955, 56.

¹³¹ Masson, 1973, no, 124 on p. 167.

¹³² This now appears to be a sweeping over-generalisation as what appears to be an Etruscan lituus with an attached mouthpiece was sold on the open market recently, although only a single photograph of this has been seen by the author.

the stone was lost, and according to Olshausen¹³³, the next illustration of this, Fabretti (1690) was an enlarged copy of Bartholinus' illustration, as have been all illustrations since. (Figure 3.5)

The cornu seen on this illustration has a relatively large diameter and would seem to date to around 100BC. In the case of the documentary material, references in the first few centuries AD are all in the works of poets or historians. It appears, therefore, that around the turn of the millennium, the lituus went out of favour to be replaced, most probably, by the tuba. To the pragmatic Romans, interested in the acoustic performance of an instrument, and not prepared to accept the more difficult lituus where the tuba would suffice seem to have dropped the instrument quite readily. In some ways the tuba is superior in performance to the lituus, its conicity increases its effective length and, more importantly gives it a range of notes that are better related harmonically. From a manufacturing point of view too, the tuba is preferable to the lituus as its manufacture involves straight tubes only and no curves as on the lituus bell.



Figure 3.5: The Gravestone of M. Iulius Victor

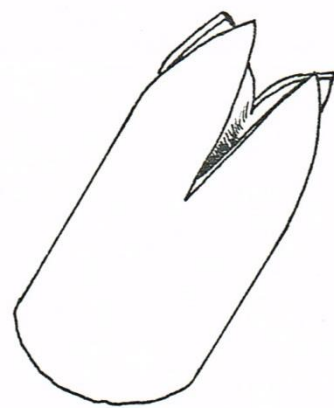
THE ETRUSCAN CORNU

The cornu appears to have developed from an animal horn (DR183) but by the fourth century BC had attained a fairly standard form. This is also seen on plate 3.1b, (IC2) where a conically-bored tube is formed into an oval with major/minor axes (ratio approximately 1.25) and with a structural strut across the major diameter. IC2 appears to be the most primitive of the instruments illustrated and, if it has a mouthpiece at all, has one with a rim of the same diameter as the tube tip. From the illustration, the cross strut across its centre appears to have been simply made from a tube slit at its end and opened out to suit the instrument tube. (Figure 3.6.)

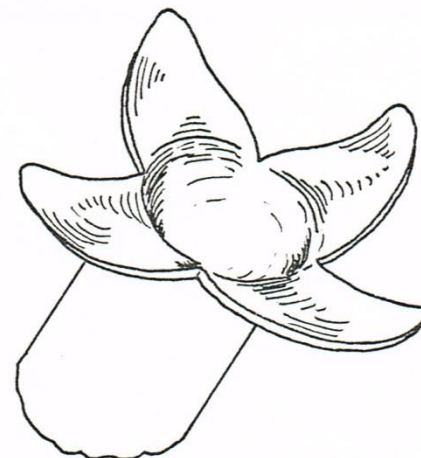
¹³³ Olshausen, 1891, 846/7.



Plate 3.1b



Initial form
cut out



Flaps bent back
to accommodate
tube curvature

Figure 3.6

Measured along its centre line, the instrument is 2.46m long (scaled) and has a cone semivertical angle (α) of 22.7mrad. A further instrument from the fourth century BC (IC73) appears to be a much more developed version of the cornu, its length being of the same order as IC2's (2.81m scaled) but its conicity being 19.2mrad (cf. 22.7). This instrument is shown with a mouthpiece, although the representation is not clear enough to give much detail.

From two centuries later (c. 300BC) comes a further representation (IC135) which has a length of 2.51m (Scaled) and a conicity of only 16.3mrad. This brings the instrument much closer to figures for modern instruments (12.5 for the oboe to approx. 6.5 for the alphorn)¹³⁴ although it is still considerably more conical than these and would, therefore, have retained something of the coarseness of tone of the earlier instruments. A cone-shaped mouthpiece can be seen at the tip of this instrument and this may possibly be taken as evidence for the use of a developed mouthpiece. The instrument retains the cross strut that remains within the limits of the tube itself although it appears to be joined to this tube by three braces attached to the strut. (Figure 3.7)

¹³⁴ Smith and Mercer, 1975, Table 21

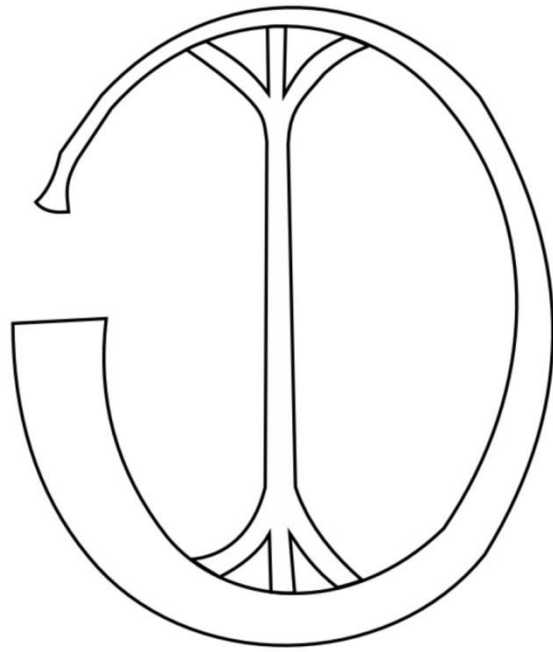


Figure 3.7

One other form which developed was somewhat shorter than the ones described above, an example found at Caere, SD216, being about $1.34m$ long and having a cone semi-vertical angle of $27.9mrad$.¹³⁵ Its cross strut is circular, narrowing out towards each end and fitting into a plate that is riveted into the instrument tube. At the tip end, the instrument has a shallow looking mouthpiece opening out to a rim of about $32mm$ (scaled).

A similar-looking instrument appears on a gravestone of a cornicen from Mantua, IC143.¹³⁶ It is remarkably similar in form to SD216 and attests to this type of instrument being used into Roman times, although this gravestone is not datable. This illustration shows the Cornicen holding the instrument mouthpiece in his right hand, i.e. separated from the cornu itself. It would appear, therefore, that this archaic form had continued to be used, although, not without the later Roman innovation of a removable mouthpiece.

Two other iconographic references to Etruscan cornua, IC84 and 115, show instruments roughly the same form as the early ones discussed, suggesting that little further development took place as during the remainder of the Etruscan civilisation.

THE ROMAN CORNU

There is little doubt that the Romans took over the cornu from the Etruscans, the earliest Roman illustration, IC16, first century BC, showing two cornu players blowing instruments of a very clear Etruscan type. The representation is not clear enough to establish a value for the cone angle but the bell diameter of $117mm$ is very similar to the earlier Etruscan instruments (IC73: $111mm$ and IC135: $122mm$).

About 9 or 8BC, the Arch of Susa was built and on this appears an illustration of two cornu players blowing instruments. (Figure 3.8) These instruments, however, although they still have the large diameter tube of the archaic form, curve over the heads of the players and are formed into a 'G' shape rather than the earlier oval form. All later instruments adopt

¹³⁵ Baines, 1976, pl. II.

¹³⁶ Behn, 1954, 139/40, Abb. 176.

this form, with the radius of the curvature of the bell yard being greater than that of the tube yard.



Figure 3.8

As well as this change, later instruments tended to have smaller cone angles achieved either by having smaller bell yard diameters or by increasing the overall length of the instrument. On IC89, for instance, an illustration of a cornu player preparing to play for a gladiatorial contest, the player is holding an instrument with a bell diameter of about 138mm (scaled) but an overall length of 2.6m. This doubling of the instrument length would halve the cone angle, reducing it to a much more "musical" 13-15mrad. (Instrument tip cannot be scaled on IC89). In increasing the length of the instrument in this way its fundamental formant would be lowered in frequency, and the number of formants that could be elicited, increased. Perhaps more significantly, however, its tone colour would change as would the ease with which the tube's formants could be pitched and held. Both these changes are suggestive of a growing desire to use this instrument in much the same way as we use modern instruments; to pitch discrete notes precisely and to hold them at that pitch for given length of time. This view is further strengthened by the development of ensemble playing of PVAs with, for example, the hydraulis (IC12, 22, 40).

However, the change is clearly not all gain as the organological changes taking place here are such that the lips of the player are being increasingly controlled by the formants of the tube. In modern times this is what we desire of an instrument, but in the earlier instruments of the Etruscan period, coarse and unstable as the notes of the instrument may have been, a measure of control over their tone-colour rested with the player. That is not to say that these were in any way variable tone-colour instruments but just that the player's lips still had a greater control over the tone-colour produced.

Nevertheless, from about 50AD onwards developments were towards smaller cone angles and longer instrument lengths. Only one iconographic reference (IC126) shows a large diameter bell later than this period (161-181AD) and this could be taken to show the lingering on of this type of instrument (or could simply be poor artistic representation).

Four extant instruments, (SD239, 243, 260 and 261) were found at Pompeii and thus date to before 79AD. One of these, (SD239) is illustrated on plate 3.2a, from which it can be seen that this, as did the other three, lack mouthpieces¹³⁷. According to Fleischhauer¹³⁸

¹³⁷ Klar, 1971, 310, Anm. 24.

¹³⁸ Fleischhauer, 1960, 502.

this instrument is 3.33m long and the following dimensions are scaled from this. It is made up of a parallel tube yard about 2.5m long and 20mm diameter. The mouthpipe is about 430mm long and tapers down uniformly to 8.4mm diameter where the end 47mm long section tapers rapidly down to 5.2mm diameter. A carrying strut of 1.23m length meets the tube at the tube/bell yard intersection being fixed both at this and the other end with a 'T' shaped pipe fitting. From one of these junctions, the bell yard opens up with what appears to be a slow exponential flare to 78mm diameter at the bell end. Around the tip of the bell is an annular bell disc of 100mm diameter. According to Fleischhauer¹³⁹, when provided with an appropriate mouthpiece, 17 notes can be produced on a close copy of this instrument.



Plate 3.2a

Three other fragments of instruments have been found in Austria. (SD238, 273 and 274) and the form and dimensions of these appear to correspond reasonably well with the Pompeii instruments.¹⁴⁰ In Kaff's paper, reference is made to the tube seam of the instrument being soldered (die Lötnaht) and says that this is not of the modern form but is a straight seam. This contrasts with the seam clearly seen on SD263 (Plate 2.4a) where a toothed seam similar to that used today is employed and it would be surprising if a straight seam had been used at a point where the tube was yet to be bent to achieve the instrument's curvature. Kaff¹⁴¹ also talks of the instrument wall thickness being 1 mm which is rather thick for sheet metal work of this period and would produce a rather heavy instrument.

In use, these instruments are seen on the Arch of Constantine (IC103, c. 80AD) and the column of Marcus Aurelius (IC106, c. 170AD), while similar instruments, apparently lacking the annular bell also are seen on IC23, (109AD) and IC 92 (C. 250AD).

¹³⁹ Fleischhauer, 1960, 502.

¹⁴⁰ Shenk, 1946, 46; Kaff, 1952, 57.

¹⁴¹ Kaff, 1952, 58.

Many other iconographic references show a bell yard terminating in a much-gentler cone and having at the end a cup-shaped disc rather than the straight annular one described above. (Plate 3.2b) On several of these references these instruments are being played alongside tubae and in these cases the tubae themselves also terminate with a similar shaped feature. (Plate 2.3b).



Plate 3.2b

These instruments also have carrying struts which extend beyond the tubes of the instrument and terminate in a decorative way. In most cases they end in a simple spike but on IC22 this is extended somewhat beyond the tube, has a decorative spike at the end of the strut and a curved brace on the tube itself. It appears quite possible, on this instrument, that this strut passes right through the tube yard and is braced hard up to this. (Figure 3.9a) The most elaborate terminal feature seen on these struts is on IC104, on Trajan's column, where a lunate disc is attached to the end of the strut which extends 500 to 600mm beyond the tube itself. (Figure 3.9b) In this case, the disc would have a clear function as a visible standard in battle. It would serve as a further rallying point, in addition to the field standards carried, the cornicines always standing near the field standards during a battle.¹⁴²

¹⁴² Fleischhauer, 1960, 502.

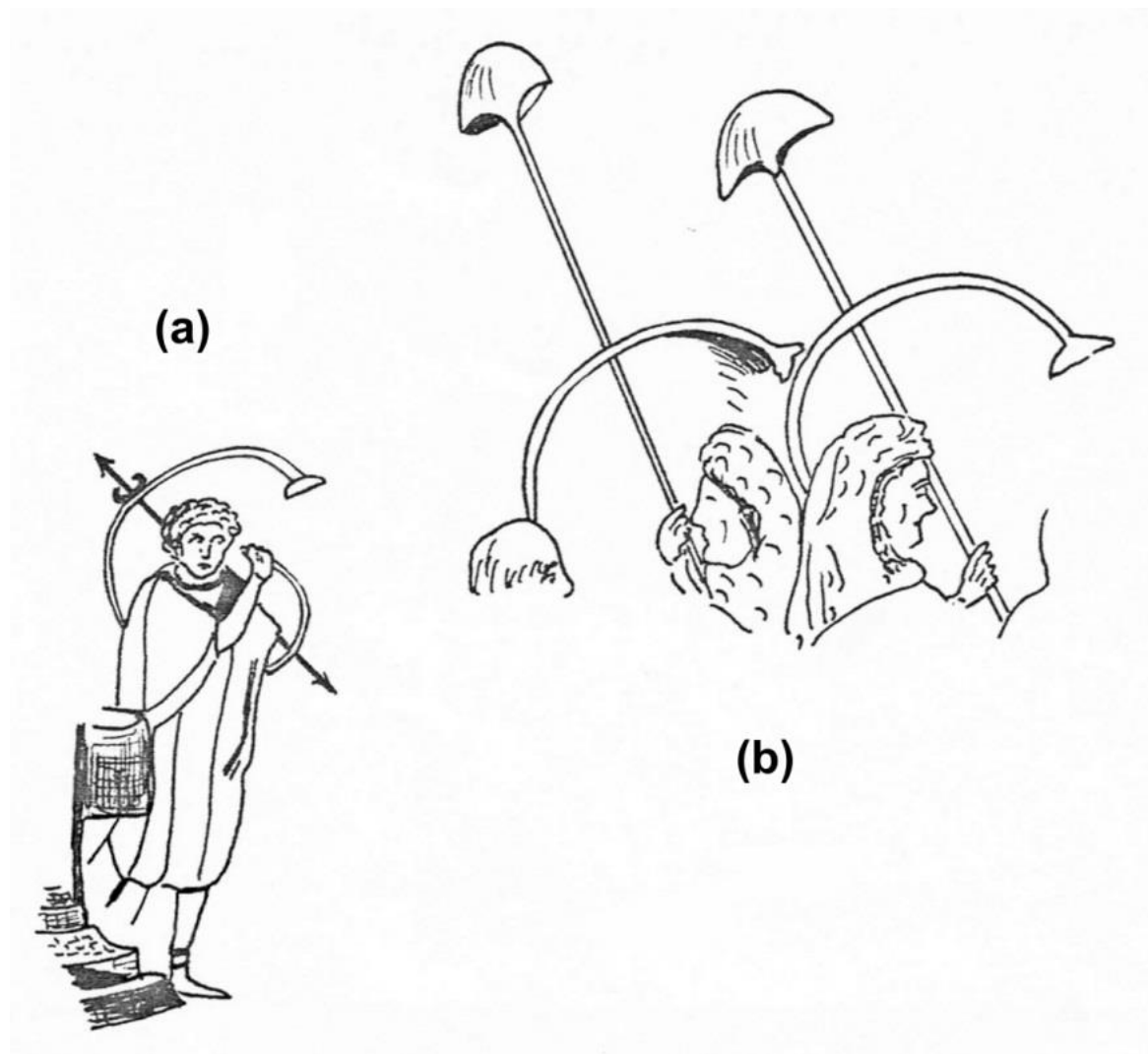


Figure 3.9

Thus the cornu seems to have been taken over from the Etruscans and by about 75 AD had developed into the form that was eventually spread throughout the Empire.

THE BONN/MAINZ INSTRUMENTS

Among the instruments used by the Romans, the only one that seems to have been used by them for the first time is the enigmatic instrument depicted on two tombstones, one at Mainz (IC1) and one at Bonn (IC142). These are parallel bored instruments with a slightly-flared bell, curved back on themselves and looking somewhat like a modern trombone. (Figure 3.10; Plate 3.3a) Unfortunately, neither of these illustrations are integrated with any material that can be scaled and so it is difficult to estimate their sizes. In an attempt to gain some idea of scale the bell diameter of IC142 was equated with the cornua on IC108 (Trajan's column) as the relationship of bell diameter to instrument tube diameter appeared to be about the same on each. This scaling, along with a rough estimate of what the original would look like (based on IC1), gave an instrument length of 1.4 m. In spite of the crudeness of this measure, it gives a length very close to that of the Roman tubae measured viz. 1.3 m, and very much less than those of the Cornua measured. It seems quite likely that this instrument was a development of the tuba having been folded for portability. In carrying out such a process the major difficulty would have been in forming the tight curves in the tube and the representation on IC142 appears to be a very faithful one showing a tube whose curvature is made up of two arcs with a fairly acute angle between. Such a shape is typically formed when a tube is bent without adequate support on the inside of the curve during the bending process. (pl 3.3 (a)).

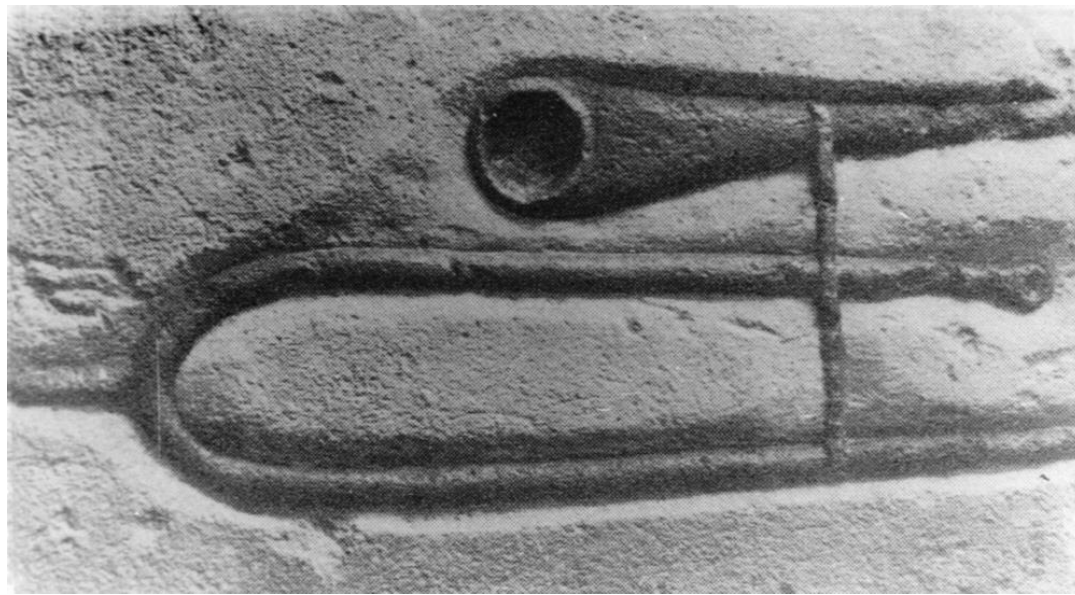


Plate 3.3a

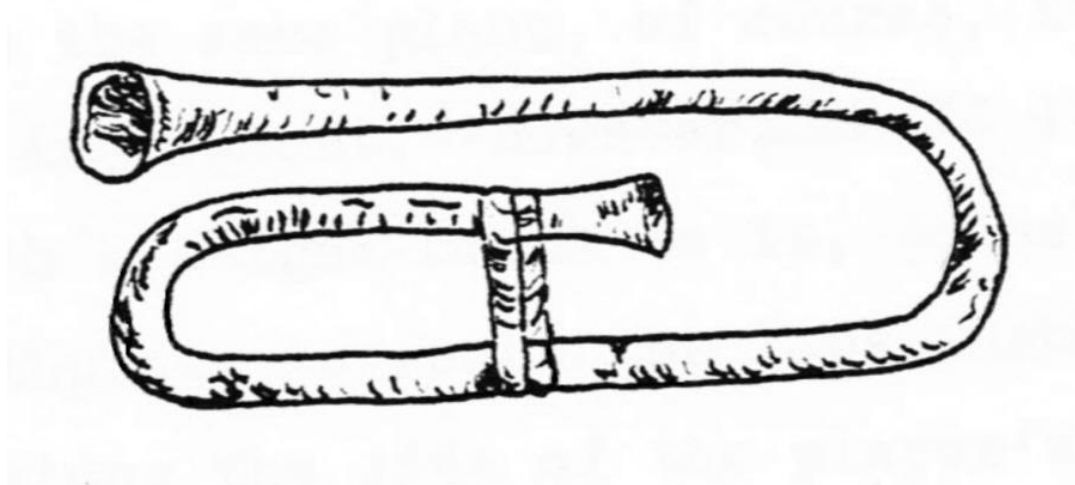


Figure 3.10

The instrument shown on Plate 3.3a (IC142) is clearly a developed form as the spike on the outside of the tube bend is in the right position to absorb shock when the instrument is mistreated and hence protect the tube there. In addition to this, the three tubes are well strapped together by a band passing over all three tubes. This would adequately locate the mouthpipe relative to the bell and tube yards, thus easing the playing of the instrument. On IC1 the mouthpipe is only strapped to the tube yard and this may well represent an earlier form.

Both illustrations are in low relief and this essentially two-dimensional representation does not allow the disposition in space of the various parts of the instrument to be determined. If all the tubes lay in the same plane, of course, it would be impossible to blow the instrument. However, on IC142 the mouth- pipe is illustrated with a slight crank in it, possibly bent just enough to allow the mouthpiece to reach the lips when the rest of the instrument passes along the side of the player's face.

IC1 is depicted on the tomb of Andes who is shown on this relief on horseback. The instrument then, was most probably developed for use of a cavalryman who would be left with one hand free for controlling his steed while blowing.

No other representations of this instrument are seen in the Roman world and no actual examples have been found. It seems particularly significant, therefore, that two instruments have been found in the area of the Rhine and it is reasonable to propose an

origin from there. This area was a frontier zone throughout much of the Roman occupation and would, thus have been a point of interchange between the Romans and the indigenous population. It was this population that produced the Celtic Lituus (See Chapter 6) and was, no doubt aware of the carnyx as a cavalry instrument. When confronted with the Roman tuba, therefore, with its unwieldy length it was, no doubt, a local craftsman that set about 'liberating' it from its set military format. As to the problem of bending the tube, he would have already met this if he had at any time been engaged on carnyx production, where the forming of the bell tube is a problem of similar technical complexity.

What the users of these instruments called them is not known although several authors have attached different names to them. Behn¹⁴³, for instance, called them Bucinae. With the only location of the existing illustrations being in this frontier area and with their presumed imperial dating, however, this name seems unlikely to refer to these particular instruments. As early as the 2nd Century BC the player of the bucina, the bucinator was referred to by Polybius (DR17) and Jerome (340-420AD) tells that the buccina (a classical period spelling with two c's) is the instrument of the shepherds. ("Buccina pastoralis est." DR177). Jerome then qualifies this by saying that it is made from a curved horn (cornu recurvo efficitur) and here, ambiguity in Latin parallels that of English in that 'horn' does not necessarily imply an animal origin. However, Vegetius (DR21, c. 386AD) uses the term aere curvo (aes, aeris = made of copper or bronze) presumably to distinguish this instrument from one made of animal horn. If, as is suggested here, this instrument is a derivative of the tuba then one might expect it to be called something like a "tuba curva," and for the name to appear sometime after the colonisation of the Rhineland. Vegetius, in the quote above (DR21) comes closest to the use of such a term in "aere curvo" but this appears to refer to the instrument played by the cornicines.

ETRUSCAN AND ROMAN USE OF SHELL TRUMPETS

The use of shell trumpets was not of great significance in the musical life of these peoples, only one reference, IC30, having been found where they are depicted in use. On this, a battle scene from an early Etruscan sarcophagus, a warrior is seen blowing a conch shell.

Other references which occur are to Triton a mythological sea god, half man, half sea creature who blows a shell of Triton tritonis. (IC79, DR28 and 29).¹⁴⁴ This mythology was adopted from Greek legend and incorporated into Roman legend with Triton blowing the concha.

Fleischhauer in a paper in 1960 presents his case for this instrument, the shell trumpet, actually being that referred to by the Romans as the bucina., However, the use of the term bucina is so frequent and the depiction of the concha so infrequent that this case appears a little manufactured.

¹⁴³ Behn, 1954, 140.

¹⁴⁴ Otto, 1953, 81.

ROMAN MOUTHPIECE DESIGN

Although the Romans achieved a satisfactory design of mouthpiece, aesthetic considerations probably played as large a part as acoustic ones when carrying out detailed design. There appears to be little standardisation in the design of mouthpieces, the cups in particular were designed to regular forms such as shallow conical or spherical surfaces.¹⁴⁵ As no mouthpieces have been found with instruments, the assignment of mouthpieces to specific instrument types is somewhat arbitrary and the criteria used are as rule-of-thumb as 'that looks right for a Tuba.'

One mouthpiece that 'looks right for a Cornu' (SD276) is illustrated in Figure 3.11 (a). It has a 35.7mm diameter rim and a hemispherical cup leading to an oval throat of 4.25/5.65mm diameter. The overall length of the mouthpiece is 133.4mm and at its downstream end is terminated by a complete fracture of the shank. Mouthpieces of this type are the commonest to be found in the Roman world.

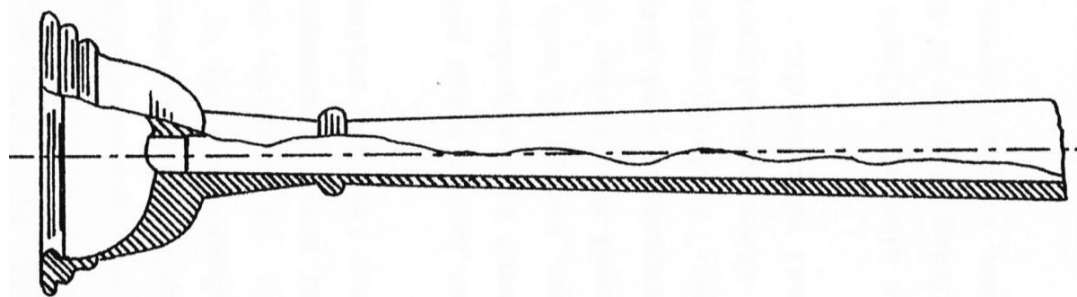


Figure 3.11a

A further mouthpiece of much smaller overall form, SD277, is shown in Figure 3.11b. This has a rim diameter of 21.7mm and a cup about 10.5mm deep leading into a throat of only 2.5mm. It is clearly designed for a much smaller instrument than SD276 and its small throat would favour the production of the higher formants on this. As it seems to be a unique find, and to come from the Rhineland area, it may be correct to associate this with the locally developed instruments discussed under the heading of "Bonn/Mainz instruments."¹⁴⁶

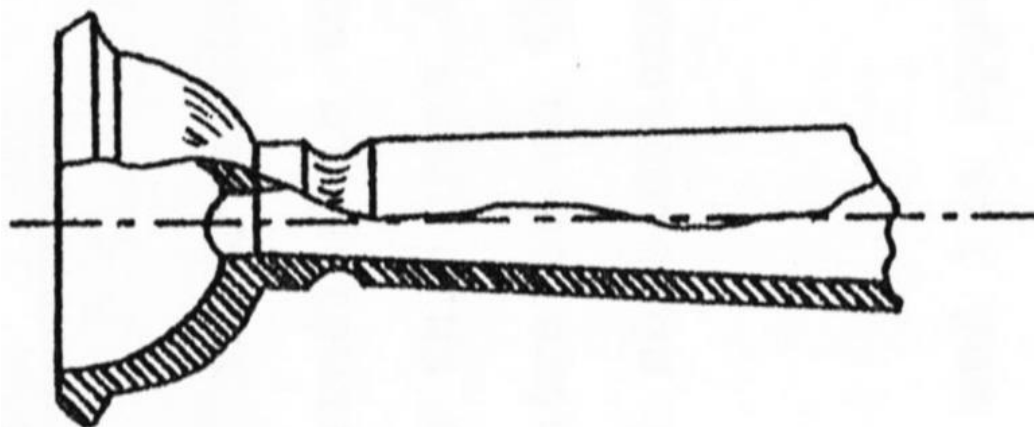


Figure 3.11b

Figure 3.12 (from Behn, 1954, Abb.181), shows some of the variety of Roman mouthpieces that have been found, although he fails to identify any of these.

¹⁴⁵ Klar, 1971, Abb. 24.

¹⁴⁶ Since this was written, another mouthpiece similar to that in Figure 3.11(b) has been examined by the author at St Albans in the UK, Roman Verulamium.

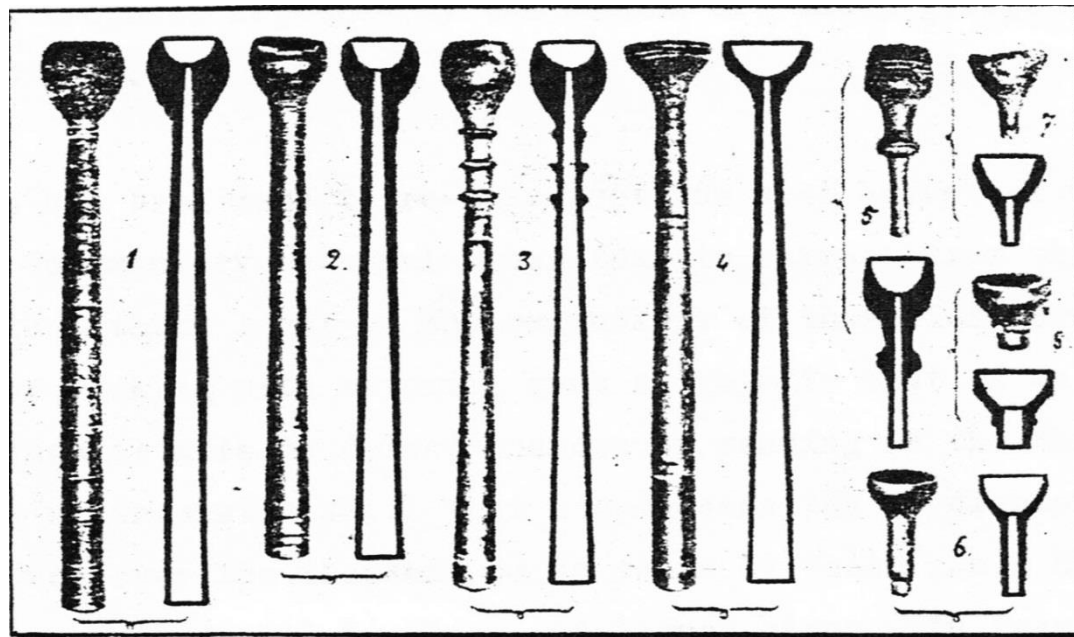


Figure 3.12

Plate 3.3b, Upper, illustrates SD231, the mouthpiece found on the Antonine Wall at Castlecary Fort.

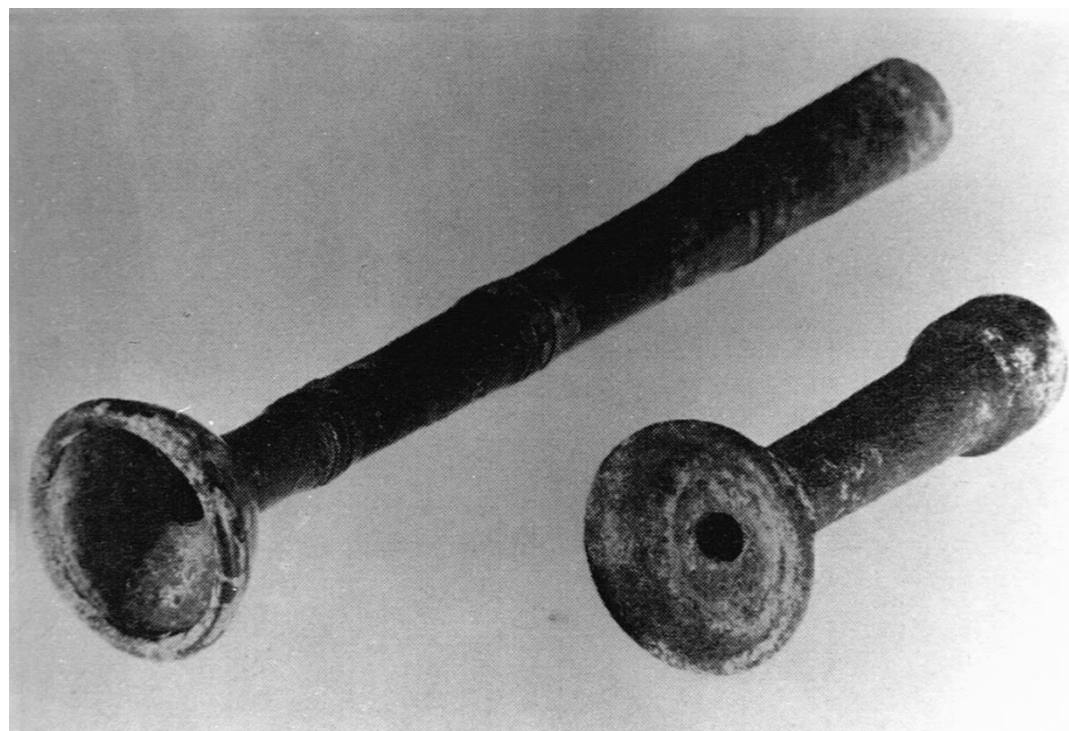


Plate 3.3b: Roman Mouthpieces

THE USE OF PVAS IN ETRUSCAN AND ROMAN TIMES

It is only proposed to discuss this area of instrumental use very briefly as this has been very extensively studied in the past and the exhaustive study by Wille¹⁴⁷ covers this area in great detail. In addition, this study has concentrated on the morphology of these instruments and the technical conclusions that can be drawn from the evidence of their use.

Changes in the usage pattern of the lituus and its apparent replacement by the technically simpler tuba have already been noted.¹⁴⁸ However, a usage of both the tuba and the cornu in groups of three developed which became the common feature, replacing the use of pairs of instruments seen throughout the Etruscan and Republican period of Rome. An early

¹⁴⁷ Wille, 1967.

¹⁴⁸ The term 'Technical' should have been qualified here to refer to the technical aspects of manufacture.

representation of this form (IC120, 50-74 AD) shows three tuba players and three cornu players, playing during the Ludi of a Servir.

By the time of Trajan's column, c. 113AD, the majority of scenes containing players of instruments have them grouped in threes, a few have single players and only one has two cornu players together.

This grouping is mirrored in contemporary Celtic representations where carnyx players are shown in group of three, IC49 (Gundestrup) and Celtic trophies captured by the Romans are shown grouped in threes (IC109).

No attempt has been made to re-interpret the vast amount of Greek and Roman documentary material other than to extract from this those portions that throw light on the organology of these instruments. The task of working with material such as this is that of an accomplished linguist able to detect nuances of meaning in the texts and having a linguistic skill that encompasses the development of these tongues over the thousand or so years of their use. However, the documentary material has been catalogued along with translations and their source. In the case of particularly relevant material where available, these have been made by the author! It is felt that this catalogue provides a basis for a more rational study of the literary references and a preliminary data-source to which the mass of material not yet located can be added when identified as relevant.

