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## POLYPHONIC INSTRUMENTS IN GRECO-ROMAN WORLD<sup>1</sup>

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### Abstract

*A few years ago, researching the Greco-Roman musical instruments, we were struck by the surprising absence of specialized monographs devoted to some polyphonic musical instruments that were present before the 2<sup>nd</sup> century BC: bagpipes, launeddas, and polyphonic double aulos. Other polyphonic instruments, pandouras and organs were well studied, starting from more than 50 years ago. For our study we gathered ethnomusicological comparative data from several European archaic populations, and scrutinized available documental sources, both literary and iconographical. The detailed analyses of this material, in Manuel Lafarga' doctoral thesis, and recent publications, allows us to assert that the presence of chords and multiphonic practices is beyond any doubts. This paper presents a brief selection of the most critical iconographic and literary sources, in order to identify the presence of polyphonic practices, an aesthetic capacity which had been long neglected in musicological studies from the of Camerata Bardi' times, in obvious disagreement with the available sources about Greco-Roman artistic, technical, and scientific achievements.*

**Keywords:** *Organology, musicology, Greco-Roman Music, Polyphonic instruments.*

### Introduction and Guidelines

This paper presents physical evidence that contradicts the mainstream idea that Greek and Roman music was monophonic. This idea started in "Camerata Bardi" times (1573-1582) and continues its life at the conservatoires and academies circles because of scholarly inertia. According to this view, Greco-Roman world was exclusively monophonic, with some minor heterophonic elements.

This presumption is not based on any real evidence from the Greco-Roman world. Girolamo Mei's (1519-1594) argument is mostly based on the absence of written mentions to polyphonic phenomenon, but the same can be said about the presence of monophony. Any survival literary source can be used for the information about the presence of a phenomenon, but the absence of evidence does not mean the absence of the phenomenon. This is perhaps one of the biggest conceptual mistakes related the music of these peoples. With the same logic, we can assert that there is no polyphony in North Vietnam minorities, as a special article in the music of Vietnamese minorities in Garland Encyclopaedia does not mention polyphony, but there are recordings from North Vietnam minorities with very complex forms of polyphony.

Till the present day, conventional musicology has disregarded systematic reviews of literary and iconographical sources. There were no monographic studies on potentially polyphonic bagpipes and *launeddas* [1], while two prestigious works from half a century ago were dedicated to lutes and organs [2]. We discussed this topic in a recent series of specialized publications, where we updated

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the existing evidence related the last two instruments [3]. In this paper I will show the most representative exemplars from each of these instruments.

Polyphonic possibilities of the instruments of such design are evident — Greco-Roman double aulos, *sopila* (Istria), *benà* (Sardinia), bagpipes, *launeddas*. Polyphonic abilities are also evident in plucked string instruments, where a single instrument can produce the complete melodic and intervallic range available to musician, using simultaneously several strings, as clearly illustrates the Mantinea Muse and one Eros from Eretria, both are shown in Figure 1.

In the same sense, the visual representations of Greco-Roman organs show performer 's both hands simultaneously over the keyboard, a fact that suggests a simultaneous (not exclusively melodic) performance. The same tendency is similar to that noticeable in the Egyptian and Mesopotamian harp representations, where performers are frequently shown with both hands over the strings, with their fingers clearly separated.

There are only two known iconographical sources of huge harps which are played by two performers simultaneously [4].

### Strings on Fretted Necks, Chords and Other Topics

The number of currently available iconic representations of classic lutes (Greek *skindapsos*, Roman *pandoura*) reaches total of 15 statuettes and reliefs from Greece [5], plus 18 Roman reliefs, almost all of them coming from the 2<sup>nd</sup> to 3<sup>rd</sup> centuries AD. Apart from these, there are also approximately 30 literary sources that mention these instruments [6].

It has been suggested that this scarcity of sources could be related to the fact that these instruments were not widely widespread, or, to their probable association to the public places of poor reputation, such as taverns. The first argument is misleading as the instruments in question were present for many centuries in various segments of daily and public life. The second argument contradicts with the presence of this instrument in the hands of a Muse (in city Mantinea) in the 4<sup>th</sup> century BC, and also in Roman funerary monuments.

We can not deny instrument 's presence in amatory environments as well (among courtiers and quotidian), not only "public events". For example, Euripides mentions "the sweet music of lutes" at weddings [7]. The most ancient classic literary source is attributed to Anaxilas (4th-century BC), who mentions the *tricordos* (three-string instrument) when describing instrumental catalogue of a craftsman in his work *The Lyre Maker* [8].

The most ancient surviving image of the string instrument comes from a cylindrical stone seal from Sumeria, from the later Uruk culture, which is based on a more ancient one dated from 3100 BC [9]. While the most ancient mention of the instrument, *pantur* (*lit.* "small bow") appears in a Sumerian cuneiform tablet from 2600 BC, which contains 23 musical references including several string instruments [10].

The Babylonian notation on another cuneiform tablet from Larsa, known as MS 5105 (dated from 2000-1700 BC) gives us instructions on how to tune a 4-stringed lute using fifth-intervals (C-G-D-A), exactly in the same intervallic order as contemporary musicians are still tuning violas and cellos. This source gives support so to the use of frets with tone and semitone steps, proving the existence of specific musical vocabulary some 4.000 years ago.

The most ancient visual confirmation of the presence of frets on lutes comes from a sculpture found among the ruins of a Hittite castle at Bos-Ojuk, north of Asia Minor: they are organized as a progressive scale on the neck. The relief is at Istanbul Ottoman Museum and is dated around 1500 BC. While they appear in Egypt around 1370 BC on one mural at Nebamun's tomb [11], in the depicted instrumental ensemble we can also appreciate a double aulos woman player with her hands

clearly positioned in an asymmetrical way on both pipes, moreover crossed to the opposite tube [12].

Other two exemplars, both of Hellenistic origin from 4th-century BC (Figure 1), represents without any doubt chord production as they show selective fingering in both hands, possibly using a counter melody, or any other type of polyphony. The figures have no details of strings or frets, but fortunately one of them retains the right hand in an unequivocal strumming position (Eros) and the other one retains both hands “fingering” in a coordinated way (Muse).

The first example, from Eretria between 330 and 200 BC [13], shows an Eros figurine playing a short lute with a lost broad neck (probably 4 strings) and with his left hand disappeared: this hand should fit its fingers in a clearly distinctive position over each one of at least 4 strings. The position of the right hand leaves no doubt that the sounds produced will be chords played together.

The second example is a high-relief from a basement founded at Mantinea city [14]: one side of the monument shows three Muses with a double aulos, a parchment, and a lute. These reliefs are typical for Praxiteles and they were curved probably by one of his disciples. Although the long neck is partly obscure, distinct right-hand fingers’ pulse and its counterpart in left-hand at the end of the neck are clearly visible.

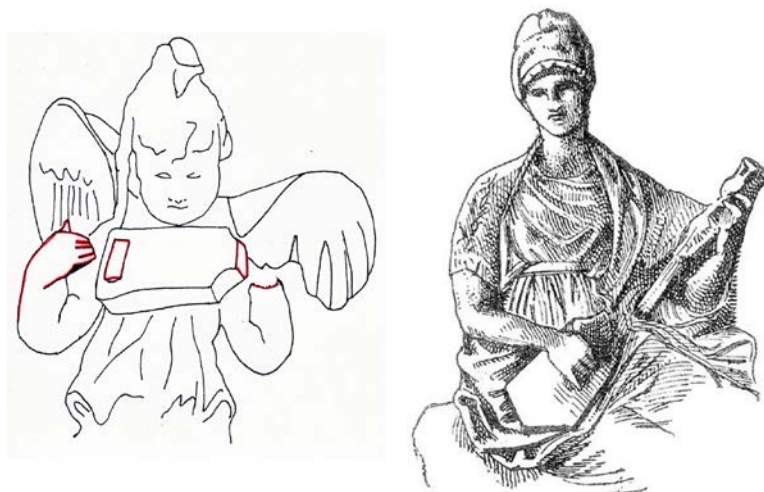


Figure 1. Eros’ terracota playing chords (Eretria, our drawing) and Muse plucking individual strings in both hands (Mantineia, drawing from Encyclopaedia Britannica, 1911)

There is no logical reason in any of these cases to use complicated hand positions aiming to produce unisons or heterophony, due to ergonomic design and to the obvious fact that the instrument allows *per se* the polyphonic performance, while the attempts to justify a monodic and exclusively lineal purpose contradict the intrinsic nature of the instrument ‘s design.

It is useful for the aims of this paper to mention the words of Photius I of Constantinople even many centuries later (9<sup>th</sup>-century AD): “the pandourion is a Lydian instrument played *without plectrum*” [15]. It means that the all five right-hand fingers were free to pluck strings in any selective, alternative, or simultaneous patterns.

### Double and Triple Pipes and Bagpipes

Double aulos was a nearly ubiquitous instrument in Classic World, being present at tragedies, in many official and religious events, in private settings, and during the funeral rites until the fall of so called paganism, and being organized in associations and professional collages which defined and defended the performers’ rights. A strike by auletes in 311 BC left the capital without music

during five days and plunged the city into the chaos, so at the end Rome sent a committee to look for them and to force them to perform their duties, at times attending some of their demands, like devoting them official holidays each year [16].

The term “aulos” gave its name to number of other instruments, as a basic component of different designs which used pipes — e.g. *askaulós* (bagpipe player), or *hydraulis* (water pressured organ). However, only a dozen of exemplars survived to our day, perhaps due to the persecution suffered during Christian times because of its association with pre-Christian, pagan feasts, rituals and worships [17].

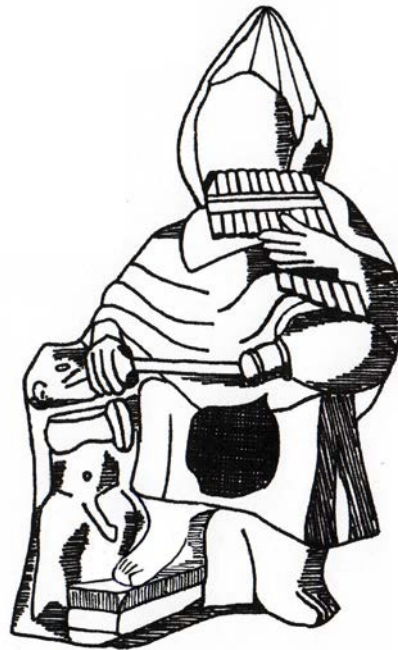


Figure 2. Terracotta of the “one-man band” from Alexandria (our drawing)



Figure 3. Headless bust from Tarsus (Cilicia)

Aulos is virtually the only ancient polyphonic pagan instrument which has not survived in actual European traditions. Unlike bagpipes, *launeddas*, lutes and organs, which made strong reappearance in European sources around the end of the first Millennium and are still present in the folklore and academic music, aulos' track is lost in Western iconography with rare exceptions (e.g. at *Cantigas de Santa María*, and also in some later sources). In our days, it can be founded only in Istria, where is called *sophila*, and in Sardinian folklore, known as *bena*.

We collected — independently from those representing the instrument with identical tubes (probably monodic) — around 100 iconographical pre-Christian sources showing pipes clearly

dissimilar, and also hands captured in different positions over the pipes, or both events at time (some of alluded survival exemplars are also included here), along with a dozen of similar sources earlier even to Roman world, all before the 5th-century AD [18].

These details point to a polyphonic performance, apart of the type and variability of the consequent harmonies, and so confirm that the main intention for double pipes was precisely this: creating the polyphonic variety of resulting sounds. Polyphonic performance was also possible in case of the instruments with identical pipes, but in this case polyphonic performance would require performer 's special intention.

Regarding triple pipes, *launeddas*, which are present in Sardinian folklore already from pre-Roman times, the presentation of Manuel Lafarga, my colleague in this Panel, shows the pertinent data along with a critical Roman source earlier to 4th-century AD, which confirm the presence of this instrumental design also in pre-Christian Roman environments [19].

Around 30 literary and 22 iconographical sources of classic bagpipe survived to the present day [20], and Hittites seem to be again the first to show traces of the instrument before the 1st Millennium BC: we have notices about an inscription founded at Karkemish although it was later lost [21]. There is also an earlier relief from 14th-century BC from Alaca Hoyuk which shows a figure blowing an animal-shaped object in a similar way to a wind instrument. The figure is supposedly a musician, as he is accompanying a lute player [22].

An Assyrian mural relief from the king 's room at Nimrud Palace, dated 800 BC, shows army divers crossing a river under the surface with the help of big skin bags (probably from goats), and breathing the contained air through a clearly designed mechanism inserted in their mouths. It is with no doubt a true representation, due to the high range of realism showed by the rest of palace reliefs, which exemplifies a precedent of the instrument even earlier to its presence in the Classic World [23].

Let me mention two other examples shown in Figures 2 and 3 as curiosities. The first is from the Berlin State Museum and comes from Alexandria: it shows a "one-man band" with a big Panpipe, a one-pipe bagpipe and a *scabellum*, together with a dwarf, accompanying him by playing cymbals. It has been proposed that the artefact pressed with his right foot could be connected to a hidden air reservoir. The presence of multiple instruments in alone musician also might be referring to a non-monodic texture of performed music.

This interesting example caused the appearance of three other figurines (with bagpipes alone) from the same zone and the same epoch, all housed today at the El Cairo Museum. The second example in the Figure 3 is the bust without a head founded at Tarsius (Cilicia), with no date: the special fact here is that the mechanism seems to consist in a prismatic box which can be pressed from different sides, and flows the air to 6 or 7 pipes placed in the back of the instrument [24].

Instruments with three pipes can be seen behind a resting (sitting) satire on a Hellenistic jewel from 1<sup>st</sup>-century BC [25] and also behind a girl facing a snake on a silver Roman coin from 64 AC [26]. Another source, not included in our previous review [27], is a fragment of a Roman disc (ca. 25-75) with just 4.8 cm size pottery oil-lamp: it can be seen a bacchant 's torso dressed with an animal skin and blowing an object sized of a bagpipe [28].

One more of these musicians blowing in animal skins can be observed in a musical quartet ensemble which carved on a stone arch from Takht-i-Bostan (nowadays lost) and dated in 6th-century AD: fortunately in this case the artefact was preserved thanks to drawings of Robert Ker Porter, made during his travels through Georgia in the beginnings of 19<sup>th</sup> century [29]. Another similar one from the same century is in a mosaic depicting carriage careers at the Gafsa 's circus, in Tunez.

These examples illustrate and complete the long life and diffusion of bagpipes in the Classic World, even after the fall of so called paganism.

### “Organon” or complex mechanisms

In classical times, the term *organon* appointed to any complex design, machine or artifact (made from different parts or elements) which be able to move and displace heavy and voluminous objects (e.g. cranes, but also scaffolds and other structures). Later it was applied also to bagpipes and to any musical instrument, e.g. in Augustine times at the end of 4th-century AD, this use remaining until past the Millennium [30].

Without doubt, organs are the most complex musical artefacts which reached our times. Its invention is credited to the Greek inventor Ctesibio from Alexandria (2-3<sup>rd</sup> c. BC), and however there are no direct data until two centuries later, it seems that the instrument was rapidly spread all over the lands of Roman cultural influence. During Roman Empire 's times it was already a municipal instrument, being present in each city which achieved *municipal* administrative range [31], through imperial endowment as in charge to local private benefactors (*evergetes*).

Organs existed in different sizes and levels of complexity. There were even portable organs, as survival iconography confirm, and they were famous as by their timbre as by their power. Hydraulic versions of the organs (including water pressure in functioning) were placed in amphitheatres and other public sites, and smaller models, probably pneumatic, were also found in private domestic aristocratic environments.

Until the 5<sup>th</sup> century AD, around 55 iconographical sources are preserved, along with approximately 42 pre-Christian and 29 Christian references [32]. Physical remains of only three organs has been recovered: one is a pneumatic instrument from Aquincum, fragments of another hydraulic one comes from Dion, and a few fragments of a more complex organ, probably hydraulic, was found in Aventicum (in contemporary French part of Switzerland).

The first of these instruments was granted by Gaius Julius Viatorinus to a fire station team, to a building that collapsed ironically as a result of fire in 250 BC, resulting in preservation of nearly all the metal pieces (including pipes), unlike the wooden structure which supported them. The city museum of Budapest exhibits a reconstruction of the instrument, from the original discovered in the first half of the last century by Lajos Nagy [33]. It had 52 pipes clustered in 4 registers each of 13 pipes: Perrot points that the 4th register showed lips and distinctive angles which could be used to modify the timbre quality [34]. There is no agreement on what was the tonal scope of the instrument, chromatic or diatonic [35], although *Bellerman Anonymi* attributes to the instrument 5 different tunings (or modes), and the range reaching more than two octaves [36].

In Dion, a very important sacred place for Hellenic World, parts of a hydraulic organ ornamented with silver, bronze and reliefs, were recovered in 1992 at the feet of Olympus mountain [37]. It is dated around 1st-century BC, and its 24 pipes represent a chromatic scale with 12 tones and a diatonic one with 7 tones, having five smaller pipes added probably as an extension of the diatonic scale. The instrument is believed to have twelve keys and two keyboards. Unfortunately, the complete sound box did not survive, and the only surviving side (frontal) shows traces of sophisticated mechanisms, with several of the smaller pieces being preserved at a local museum.

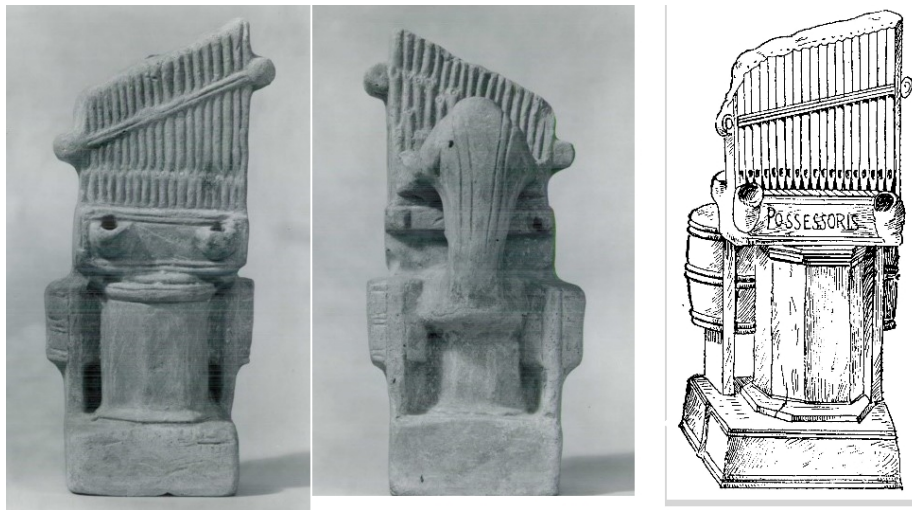


Figure 4. Terracotta: oil lamp founded at Cartage, manufactured in Possessoris' fabrica.  
Photos: Wardle, 1981; drawing from Encyclopaedia Britannica, 1911

Beside these two exemplars, there are several complex fragments of an organ 's sound-box from Aventicum (Avenches, French part of Switzerland), which have allowed to reconstruct and complete some functional details of these instruments [38]. One fragment shows holes to insert more than seven pipes distributed in at least 6 rows (air registers). The rests appeared at Villa Derrière la Tour palace, and it is possible that it would be a 6-register model as those mentioned by Vitruvius. The instrument had 12 keys to be played.

The popularity of *hydraulis* is well exemplified also by the industrial production of scale models as oil lamps, like that showed in Figure 4, being recovered 4 similar designs from Roman Carthage environment. This concrete example was produced at "Possessoris' fabrica" between 175 and 250 AD, pointed by the inscription, and it is the most comprehensive survival source attending details of the instrument: lateral Ctesibius pumps are clearly seen, as the 3 rows of pipes of proportionally length at  $1/1$ ,  $2/3$  and  $1/2$ , indicating the octave, fifths, and fourths intervallic distances [39].

### Concluding remarks

We can now make a general conclusion that the prevailing views on the nature of Ancient Greek and Roman musical practices as monodic is not supported by the available evidence. Great number of polyphonic instruments, both wind and string instruments, present a picture of a rich musical life filled with harmony.

It was probably the introduction of musical practices of Early Christianity with characteristic monophonic singing practices that disrupted the polyphonic pre-Christian practices. After several centuries of domination over pagan practices, polyphony made a gradual comeback and monophony became the leading form of musical expression of the Christian World.



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