

Music and Sounds in Ancient Europe

Contributions from the *European Music Archaeology Project*



Editors

Stefano De Angeli, Arnd Adje Both, Stefan Hagel,
Peter Holmes, Raquel Jiménez Pasaolodos, Cajsa S. Lund

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Our history as Europeans reveals a strong network of exchanges, relationships, loans and shared developments. In this rich and wonderful tapestry, music plays a major role, both as a foil to the natural predisposition of this language to contamination, and for its exceptional importance in the generation of personal identity.

Travelling back in time through Europe's musical past, therefore has a huge cultural and political value. Through the discovery of ancient instruments and the resulting ability to understand and appreciate the music which was played and heard throughout Europe, from the Stone Age up to the end of the Viking period, and in some cases beyond, we can in fact go to the source of our identity and see the wealth which comes from the meeting of different cultures. The European project EMAP - European Music Archaeology Project and the travelling exhibition *ARCHAEOMUSICA – The Sounds and Music of Ancient Europe*, were developed with this primary goal in mind, within the framework of the Culture Programme of the European Commission.

The travelling exhibition, enriched by presentations and workshops, involved ten different institutions and seven different countries. A great amount of research and organization has gone into it and this has borne fruit. Here, in Lazio, there has been a great deal of public interest in the project and it has been enthusiastically supported by many young people. This is a great success story, one in which we are really proud to have been able to participate, and it confirms how crucial it is to establish a common cultural identity: not only to promote a peace, but also to develop conditions within which we can do things together, sharing planning and scientific investigations, into the significance of cultural heritage within the European and Mediterranean *koiné*.

Nicola Zingaretti
President of Lazio Region

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Foreword

In Europe, musical instruments have been found which date back to at least its early occupation by anatomically modern humans, around 40,000 years ago. In many respects, study of these has however been a relatively recent field as, before the beginning of the 1980s, pre-historic music had played a comparatively small role in archaeological as well as in musicological research. Of course, the music of cultures which did not produce evidence such as music-related images or writings is very difficult to explore. Often only a few potential sound tools are found, mostly in fragmentary state and hardly ever in playable condition. Here purely evaluation-based archaeology and musicology, even if aided by iconology and philology, are of limited use. The important questions which arise from such studies can only be addressed by physically exploring the possibilities offered by playable interpretations of the available evidence.

From Neolithic times, many well-known archaeological cultures have left musical instruments or other traces related to musical practices. From the Bronze Age onwards, we possess an ever-growing amount of archaeological, iconographical and, surprisingly early, textual evidence about music, which embed musical instruments and their sounds within their social and cultural context. In the case of Classical Antiquity, even certain aspects of actual musical pieces can be reconstructed, thanks to preserved examples of musical notation as well as a number of extant music theoretical works.

Until not long ago, music-archaeological research has concentrated on smaller cultural areas or time spans. Only recently has the available information been enabling a more global perspective on past musics to be achieved, in which cultural interrelations become apparent, and can sometimes be traced across vast spatial, temporal and cultural distances.

Drawing on several study groups established in the early 1980s, an international team of archaeologists, musicologists, instrument makers, musicians, composers, sound designers, film-makers and computer artists formed in 2010 to take the challenge of exploring 40,000 years of European music from different perspectives. In the resulting *European Music Archaeology Project* (EMAP), ten institutions from seven countries collaborated with numerous associated partners from 2013 to 2018, supported by the cultural programme of the European Commission.¹

The project focused on Europe's ancient cultural roots from an unusual perspective, combining musical, scientific and sensorial aspects. Musical instruments of the European past were explored with special reference to the exchange of musical knowledge between diverse cultures, culminating in the powerful experience of a travelling multimedia exhibition called *ARCHAEOMUSICA – The Sounds and Music of Ancient Europe*. This was accompanied by an extensive programme of performances and workshops. The exhibition presented the highlights of ancient European musical instruments, brought together for the first time in the form of high-quality, playable reconstructions, capable of reproducing, as closely as we are currently able, the original voice of the instruments. Wherever possible, they were made from the same materials as the originals, sometimes also using similar production techniques. The replicative processes have evidenced the sophisticated

¹ This project ranked first out of the 80 projects entered for the EU's most prestigious cultural competition in 2012, Strand 1.1 of Education, Audio-visual and Cultural Executive Agency (EACEA). Coordinated by the Comune di Tarquinia, Italy, EMAP was jointly organized by the University of Valladolid (Spain), the Austrian Academy of Sciences (Austria), the German Archaeological Institute (Germany), the University of Huddersfield and the Royal Conservatoire of Scotland (UK), the University of Tuscia and the Regione Lazio (Italy), Musik i Syd (Sweden), and the Cyprus Institute (Cyprus).

knowledge and skills which are required for producing and playing these instruments, and thus, the significant place of music in ancient societies. In the exhibition, some of the instruments were available for visitors to touch and play, while recordings were provided of others. A set of multimedia installations and an interactive audio tour explained the making, playing and cultural contexts of these fascinating sound tools from the past, and a larger documentary called *Blasts from the Past* is accessible online. This shows the processes which lead from an archaeological find to accurate reconstruction of an instrument and provides performances which bring ancient instruments back to life.

The present volume reflects most of the strands of our project. A great variety of music-archaeological topics are here addressed by prominent music archaeologists who have been involved with EMAP in various ways, and to whom we wish to express our gratitude for sharing their fascination with this unique field of research.

The editors





Primordial Sounds

1.1 Prehistoric Sound Worlds.

Use and Function in the Remote Human Past

Cajsa S. Lund

Today, in the modern world, we hear sounds almost continuously. In Prehistoric times there was much more silence. Now, most sounds come from gadgets and machines. In Prehistory, sounds from nature predominated.

How did people listen? We know that *Homo sapiens* has changed very little as a species during the past 40,000 years. Those changes, which have been ascertainable in human living patterns, clearly arose more from changes in their environment than from changes in people themselves. Obviously our listening habits depend upon the availability of sounds around us, but the importance, which we attribute to sounds, also helps to determine how we hear. Certain sounds are important for us to respond to, others not. For Prehistoric people it must have been important – sometimes perhaps a matter of life or death – to recognise animal sounds, in order to locate prey or detect from whence predators threatened and equally importantly to react appropriately to the sounds of natural forces. Can we develop any understanding of how people listened in ancient times?

The music. It is even more difficult to determine what kind of music may have existed in Prehistoric times. That music did exist is certain, for all over the world music appears to be as prevalent as speech. Thus far, ethnomusicological research has not come upon a single society who do not display some form of musical activity.

It should be noted, however, that when ethnomusicologists refer to music they include a great deal more than those sounds which we contemporary Westerners normally associate with music in our everyday speech.

Clues to Sounds. Our knowledge about intentionally-produced sounds in the remote human past is based upon archaeological finds of sound instruments, either intact or in fragmentary form – the material traces of supposed ancient sound makers. Some artefacts were without doubt made expressly to produce sound, for example bone pipes with finger holes, whereas in other cases we are faced with exciting questions. Are the bone

pieces with carved notches scrapers which were used for sound production or are they something completely different? If so, were they occasionally also used as sound tools?

Preserved sound instruments, certain and possible, intact and fragmentary, must necessarily be reconstructed to make it possible to test their methods of playing and their tonal qualities. But this does not suffice as the sole basis for understanding their use and function in Prehistory; for the sound of such a device depends not only on its construction but equally upon what sort of playing technique was employed for it and how the performer grouped the sequences of sounds. This, in turn, depends on what the performer was striving for, which is connected with *why* they were producing sounds. By studying the use of sounds by ethnic groups all over the world, both historically and ethnographically, we can put forward possible reasons why sounds were produced in Prehistoric times.

Sounds are of practical use. Human history is characterised by the struggle for existence, a battle fought with ever-newer weapons. Sounds are but one of these – and perhaps one of the first to be consciously used. Heavy labour, such as the hollowing out of a tree-trunk to construct a boat, is made easier if the work is organised by use of rhythmic patterns. Hunters lure their prey by imitating their sounds. People communicate over long distances with different acoustic signal languages and they have also learnt to communicate in a similar manner with domesticated animals. Thus sounds can have practical value.

Sounds in ritual and magic. Many peoples believe in a world full of demons and other evil beings which threaten to harm them through accidents, illness and natural catastrophes. With the help of certain actions, they believe, they can protect themselves against such things. When equipped with a mask, and by distorted voice, speech and movements, some societies believe that persons can acquire the power to withstand such forces – a magic power. Actions which have appeared to prove effective are repeated and become fixed as rituals. These are developed into complicated magical ceremonies. Music, song and dance often make

up the most important elements in such rituals.

Sounds have an influence. But sounds have the power to influence not only nature and the supernatural powers, they influence people themselves, too. In ancient Greece and China, for example, it was considered that the right sound made persons good and well balanced. The wrong sound made them antisocial, insensitive or lazy.

Sounds for enjoyment. In Prehistory, too, sounds must have played a considerable role in ceremonial and magical rites, in practical labour and communication as well as for entertainment and pleasure, not least in children's games.

Some sound activities were possibly restricted by taboos. Could women pluck their men's bowstrings for the sake of the sound? Were children allowed to amuse themselves with adults' signal drums and bird calls? Some sound tools were perhaps more important as status symbols or material possessions than as sound producers. It is possible, therefore, that in certain cases they have been considered as objects with intrinsic

magical/healing powers. We know, for instance, that the aborigines of Australia placed bullroarers on circumcision wounds in order to speed up the healing process.

One sound – many purposes. Ethnographers observe that different functions often co-operate or co-exist in one and the same action. Furthermore, the same type of sound production may have objectives which change according to social context. It is reasonable to assume that the same was true in Prehistory.

The lost instrument! Studies on Prehistoric sound worlds are based on surviving sound-producing devices. It must not be forgotten, however, that the human voice may have been the dominant means by which our Prehistoric ancestors created their music and soundscapes, in the shape of lullabies and other lays, in magical sagas, dirges, creation myths and epic tales utilising repeated tonal formulae, inciting cries and calls, and such like. Indeed, the human voice is for ever a lost instrument!

1.2 Music at the Dawn of Humanity

Arnd Adje Both

We cannot know when our European ancestors first engaged in musical activities. Whenever such activities involve using only the body or the voice, they leave no material trace. To create an archaeological record, music-making needed to shape the environment – perhaps by leaving traces where ringing stones in the form of stalagmites were hit or by the creation of sound tools and musical instruments as such. However, most prehistoric tools would not survive for long as the materials from which they were made, such as wood, bark, hollow plant stems, animal skin, sinews or twisted gut, decay all too quickly. Only where the most durable materials were involved we are able to detect more or less unequivocal evidence of musical activity.

Among the surviving prehistoric sound artefacts are flutes or clarinets of bird wing bones and mammoth ivory, bullroarers of antler, rattles and scrapers made from bone, antler, teeth and shell, and most probably ringing stones (lithophones). In the Neolithic period, horns made from the shells of marine snails and a number of instruments made from fired clay appear in the record, including rattles, whistles, drums, and horns resembling animal horns.

Even where instruments and sound tools survived, it is often difficult to tell much about their intended usage. Prior to the beginning of the Bronze Age (in Europe in the second half of the third millennium BCE), only very few representations of musicians, dancers or instruments are known. Interpretation of earlier musical life mostly relies on the archaeological context when known, and on the decoration of the sound tools themselves, along with parallels to the playing techniques and social functions of comparable modern instruments.

A controversial find from Slovenia is the thigh bone of a young cave bear from the Divje babe cave, bearing traces of human workmanship as well as marks made by animals (Fig. 1 a-c). It has been dated between 58,000 and 48,000 BCE, to a period shortly before the first evidence of European settlement by anatomically modern humans, and belongs to Neanderthal culture. At one end

the bone has a gash and holes are found on both sides of the bone, which could be interpreted as the finger holes of a flute. The find has led to heated debate among scientists, primarily concerning whether the perforations are of human origin or caused by the bites of cave lions or hyenas. Importantly, it could decide the issue of whether the Neanderthals had the ability to produce music, or whether this ability was first acquired by modern man. There is a number of other Stone Age finds of cave bear and other bones with comparable perforations, which are yet to be studied.

Towards the end of the last ice age, almost contemporary with the settlement of Europe by anatomically modern humans, both the earliest certain instrument finds and the first evidence of figurative art are evident. One route of settlement was along the Danube, which carried the meltwater of the receding ice masses to the Black Sea. In the valleys of some of its tributaries in Southern Germany, the caves of Hohle Fels, Geißenklösterle and Vogelherd have yielded musical instruments being dated to 38,000 BCE. They are wind instruments, with four to five fingerholes, which are made from the wing bones of vultures and swans or from mammoth tusks (Figs. 2-4). Along with small sculptures made of mammoth ivory, they provide the earliest evidence of human art. The oldest instrument of this kind (Fig. 2) was discovered in the immediate vicinity of a Venus figurine in the front part of the Hohle Fels cave.

It is not yet clear whether these bone pipes are edge-blown flutes (instruments with a sharp edge against which the breath is directed) or clarinets (instruments with a vibrating reed). This is because both ends of most of the finds are damaged. Only the oldest pipe has one intact end, marked by a diagonal cut which might have served to mount a single reed of birch bark or some other material. However, it could just as well have been the distal end of the instrument. Additional finds with comparable traces of workmanship would be needed in order to clarify the matter.

Most extant Palaeolithic ‘flutes’ are produced from bird wing bones, taking advantage of their natural long cavity. It is all the more

astounding that the pipes were also produced from mammoth ivory, in the most sophisticated technical process known from that period (Fig. 4). After a long cylinder had been carved from the tusk, it was split longitudinally into two halves, which were subsequently hollowed out and finally glued back together. One reason for going to all this effort may have been a special cultural significance of the original mammoth material. Another motive might have been that significantly longer instruments could be fashioned from mammoth ivory, and these would have had distinct sound characteristics – in this case, a lower pitch.

The tradition of wind instruments made of bird bones can be traced throughout the entire Stone Age and beyond. A particularly rich find complex comes from the cave of Isturitz in the French Pyrenees. Fragments of over twenty instruments were found here, most of them dating to the Palaeolithic period. The cave was possibly valued for its peculiar acoustics and might have been used for ceremonial gatherings. At several locations within the cave, natural lithophones formed from limestone deposits produce notes of various pitches when gently struck.

Many of the Stone-Age pipes display more or less complex scores on their surface, sometimes spaced regularly, but often also quite irregularly placed. Much has been speculated about the significance of these patterns, with interpretations ranging from marks indicating locations for prospective finger holes, their use as tally sticks or to symbols relating to religious concepts.

Some enigmatic finds of large numbers of bird bones without finger holes have been made in Isturitz as well as in a number of caves in the Pyrenees, the Cantabrian Mountains and the French Massif Central. These might be simple whistles, panpipes, if tied together – or, indeed, not musical instruments at all. Tubes of different lengths might, for example, also have been used to apply pigments to cave paintings. Panpipes made of animal bone are known from Eastern Europe, but only from the Bronze and Iron Ages, several thousand years later.

Another type of bone flute, typologically similar to the modern recorder, is more easily identified as a sound tool. Such instruments have a fipple plug with an open duct leading to the aperture's edge – though the plug never survives, as it would likely have been made from a perishable material like beeswax. The first Palaeolithic finds of this type, coming from the French Pyrenees and the Massif Central, lack finger holes and should therefore be regarded as whistles rather than flutes, especially since they are also very short and therefore high-pitched. Later finds from France and Denmark, which date to the Neolithic, do possess finger holes. Palaeolithic and Mesolithic whistles were also manufactured from the phalanges of hoofed animals such as reindeer or red deer, and Neolithic ones, from the teeth of wild boar. Some Neolithic bone pipes from the Netherlands scarcely differ in form from medieval and modern whistles used for bird hunting.

Numerous Palaeolithic and Mesolithic objects found in various caves in the above-mentioned mountain ranges in France and Spain may be bullroarers fabricated from reindeer antlers (Fig. 5). Comparable Mesolithic and Neolithic finds are known from northern and southern Europe, Denmark, southern Sweden and northern Italy, for example. These flat, pointed objects with a perforation at one end are frequently decorated on one of the flat sides with abstract or figurative scoring. If these objects are fastened to a cord or string and swung through the air in a circle, their movement produces a buzzing, humming or even wailing sound, depending upon the velocity and weight and size of the object. Bullroarers are known to exist in many cultures worldwide and frequently have a function linked to powerful taboos. They are often used in initiation rituals during which the ancestors are summoned, their voices being associated with the sound of the swinging bullroarers, but they can also be used in entirely secular contexts. Up into the 1960s and 1970s schoolchildren repurposed wooden rulers for use as bullroarers, of course ignorant of the fact that such instruments have been played for at least 20,000 years.

Constructing a Palaeolithic Clarinet

Jean-Loup Ringot

The aerophones found in Geißenklösterle (southwestern Germany) were originally interpreted as flutes, and they may have been played as such. But the similar artefacts found in the cave of Hohle Fels have prompted music archaeologists to consider whether these may have instead functioned as reed aerophones. Such an aerophone can be more specifically classified as an early form of the clarinet. We will now build such a clarinet.

Required materials and tools

- a bone, in this case the radius of a swan
- a piece of birch bark for the single reed
- an animal tendon, in our case a piece of string
- some wax
- a sandstone slab to use as a sandpaper
- some flint tools: a blade, a drill and a burin

Getting down to work!

First of all, one end of the bone is beveled by rubbing it on the sandstone slab, then four holes are made, first using the burin and then the drill (Figs. 1-2).

The piece of birch bark is cut to size, placed on the beveled end of the bone, and fastened in place with the help of the string, which is then tightly sealed with melted wax (Figs. 3-5).



Fig. 1 The chamfer is ready



Fig. 2 The material: sandstone and flintstone tools



Fig. 3 The reed is fixed...



Fig. 4 ...and sealed with wax.



Fig. 5 Our Palaeolithic clarinet is ready to play!

The first evidence of the use of horns made from large conch shells in Europe dates to the beginning of the Neolithic Period. Shell horns have been found in caves in Sardinia, along the Italian Riviera and in southern France, and there is also a hoard from the hill Ösel

in Lower Saxony, Germany (Fig. 6). The latter is important as it provides evidence that there were early contacts with cultures in the Mediterranean area, which is the only place in Europe where marine snails of that size are to be found. Animal horns may have

been in use in a similar function from times immemorial; but as these decay rapidly, they are not attested before the Iron Age.

Stone Age rattles and scrapers were found at a number of archaeological sites. Notched bones found in French caves, which produce a scratching noise if rubbed with another object like a shell, are among the oldest relics that may have been used in this way. Neolithic and early Bronze Age bone scrapers were excavated in the Solsem Cave on the Norwegian coast – these likely being used in rituals – as well as others found on the Swedish island of Gotland. The artefact from Gotland is a scraper made from a jawbone of a wild boar, and it was found with a shell rattle next to it.

Grave goods provide evidence that a culture which made extensive use of rattles flourished throughout the large arc around the Baltic Sea during the Mesolithic and Neolithic. The rattles were made of perforated elk, deer, seal and wild boar teeth, and they seem to have been fastened to clothing in long rows containing up to 150 and more teeth. The teeth that were sewn along clothing about the leg and arm are similar to the metal bells and rattles attached to clothing used in many shamanist traditions up to the present time, which confer magic protection.

A possible percussion ensemble made of mammoth bones excavated in Mezin (Ukraine) has been dated to the Palaeolithic era, around 20,000 BCE. Several roundhouses, used primarily as human dwellings, with foundations and roofs of mammoth bones and tusks were excavated at this site. One of the roundhouses had an inventory different from the others, suggesting a use for ritual gatherings. Various mammoth bones painted with red zigzag lines were found there, some bearing traces of hard impacts. Near these bones were also found rattle bracelets of mammoth ivory, a large shell rattle and a mallet made of reindeer antler, which was apparently used to play the bones. Experiments have resulted in the discovery that the shoulder blades and thigh bones of mammoths have particularly good acoustic properties and that the jawbones may have served as scrapers.

Apart from natural lithophones such as the stalagmites mentioned above, there are also artefacts which appear to be portable ringing stones of various dimensions and accordingly different pitches, such as those excavated in d'Étiolles south of Paris. These were made of flint and look like blades, but they are too large to have been used as tools. In d'Étiolles they were found carefully aligned next to each other, as might be expected in the case of a xylophone.

Membranophones are normally made of wood and skin and would not survive in the soil. Rather than the drums themselves, one might expect that drumsticks produced from hard materials might have been preserved. Possible candidates are tools made from elk and deer antler, found in southern Sweden and Denmark and dating to the Mesolithic, approximately 8,000 to 6,000 BCE. Comparable drumsticks of hard animal material are still used by several hunter-gather cultures of the circumpolar area.

Now that we have looked at a broad variety of instruments, the question arises whether there is any evidence that stringed instruments existed during the Stone Age. Such instruments appear to have first entered Europe from the ancient Near East in the Bronze Age, toward the end of the third millennium BC, as evidenced by Cycladic sculptures of harp players. It is not known whether simple stringed instruments existed before that time in Europe. The earliest hint of the use of stringed instruments comes from a Palaeolithic engraving in a cave in the French Pyrenees (Trois-Frères), which depicts a half-human, half-bison figure – possibly a shaman – who may be playing a musical bow. However, the figure has also been interpreted as a flute player, and since he appears in the midst of a hunting scene with many different animals, he could also be holding a hunting bow. Unfortunately, the original engraving can no longer be studied since it has faded extensively since its discovery and what we know of it comes only from a sketch of unknown accuracy made in the 1920s.



Fig. 1a-c Cave bear 'flute' from Divje babe I cave, Slovenia.



Fig. 2 Vulture bone pipe from Hohle Fels cave, Swabian Alb, Germany.



Fig. 3 Swan bone pipe from Geißenklösterle cave, Swabian Alb, Germany.



Fig. 5 Bullroarer from Grotte de la Roche, Lalinde (Dordogne), France.



Fig. 4 Mammoth ivory pipe from Geißenklösterle cave, Swabian Alb, Germany.



Fig. 6 Shell horn from Ösel, Lower Saxonia, Germany (3,000 BC).

1.3 Sounds and Caves

Rupert Till

In the cold winters of Prehistoric Europe, at a time when there were no stone buildings, the entrances to caves provided humans with shelter from bad weather and from dangerous animals. However, the deeper tunnels of these spaces were alien territory, where lurked dark mystery, as well as sometimes dangerous animals that humans might have wanted to avoid. Caves are warm in the winter and cool in the summer, and they provided a stable base for a mobile population. Around 40,000 years ago a creative explosion saw humans decorating these dark spaces with paintings and engravings, and there is evidence they made music as well.

These caves became dramatic audio-visual environments. Most evidence of Prehistoric human life in caves is at their entrances, where there was light and where smoke from fires could drift away. Voyaging deeper into the caves provided a very different experience. People ventured down into the depths of the caves only occasionally, perhaps to take part in rituals associated with coming-of-age, fertility or seeking wisdom from long-dead ancestors; in many cultures caves are entrances to the underworld, special places where spirits live. As in most human rituals, it seems that in these cases music was involved. Sound in these caves is very different to that outside. As you enter the intense darkness, the dramatic silence wraps you like a cloak. There is little background noise, no sounds from animals, birds, insects or wind, and along with the deep blackness, this makes you feel as if you are in another world. Just as bats and even monkeys use sound in caves to find their way around, there is evidence that humans used the remarkable acoustics of these spaces to navigate. With flickering lamps that only lit one meter around them, the best way to know if there was a tunnel ahead or a gaping hole in the ground was from the different sounds that you could hear as your voice came back to you changed by the surroundings.

Caves have very interesting acoustic soundscapes. Their enclosed space and damp stone walls reflect and contain sounds, sustaining them as what we call reverberation, much as we hear

today in a bathroom or cathedral. Added to this, long tunnels and flat surfaces cause echoes to bounce around, as if a voice is responding to your calls. These differences in acoustics could be used to help navigate. The sound of running water rushes up from holes in the ground, where underground rivers race in the darkness. Water drops fall from the roof, creating miniature explosions in the reverberant atmosphere. These sometimes fall onto stalagmites, some of which ring like bells when water hits them, the cave softly singing to itself. All around you sound provides clues to the size and shape of the space around you. Ancient people marked some of these acoustically interesting positions. Some stalagmites were marked with red dots, and in Arcy-sur-Cure Cave in France there is an example where only one of two adjacent stalagmites is marked. Of course, it is the one marked with this abstract art that rings. Other ringing rocks have had the ends snapped off in Prehistory, perhaps as keepsakes. In Tito Bustillo Cave in northern Spain (Fig. 1a-b) a whole section of stalagmites and stalactites that ring like a xylophone when struck are marked out as special with more red paint. This suggests that 30,000 years ago or more people used these ancient sound-makers like musical instruments. More conventional musical instruments, made by people, have been found in many caves, especially pipes made of bird bones and mammoth ivory, but also bullroarers and rasps made from deer antler. It seems that caves from Germany through France down to Spain were home to musical rituals, where strange sounds echoed through the air, sustained by the long reverberation.

Singer and researcher Igor Reznikoff has found that certain parts of caves respond to the human voice, for example particular niches amplifying bass tones to make a sound like a roaring bull. He has been able to find paintings in total darkness by using his voice to search for interesting acoustic properties, and there is evidence that unusual acoustics encouraged people to paint in particular places. Some of these acoustics are very remarkable. In France, Isturitz Cave (in which ancient bone pipes were found) has

a large chamber where sound resonates intensely for seven seconds, longer than in most churches (Fig. 2). In La Garma Cave in Spain it seems that paintings such as hand stencils were made in the smallest hidden side chambers, where the sound – with almost no reverberation – offered an underground traveller a secret place to connect with the surrounding environment. Evidence suggests that in Spain it was these intimate sounding places that

were chosen for ritual decoration (Fig. 3).

Overall, caves were unique environments for early humans, used for tens of thousands of years for music and sound making as much as they were for painting and shelter. The soundscape of caves was radically different from the noise of life outside. They were sacred spaces full of the voices of ancestors echoing through the air.



Fig. 1a Lithophones in Tito Bustillo Cave in Asturias, northern Spain.



Fig. 1b Lithophones in Tito Bustillo Cave in Asturias, northern Spain.



Fig. 2 Anna Friederike Potengowski in Isturitz Cave playing as a flute a reconstruction of a vulture-bone pipe found there by archaeologists.

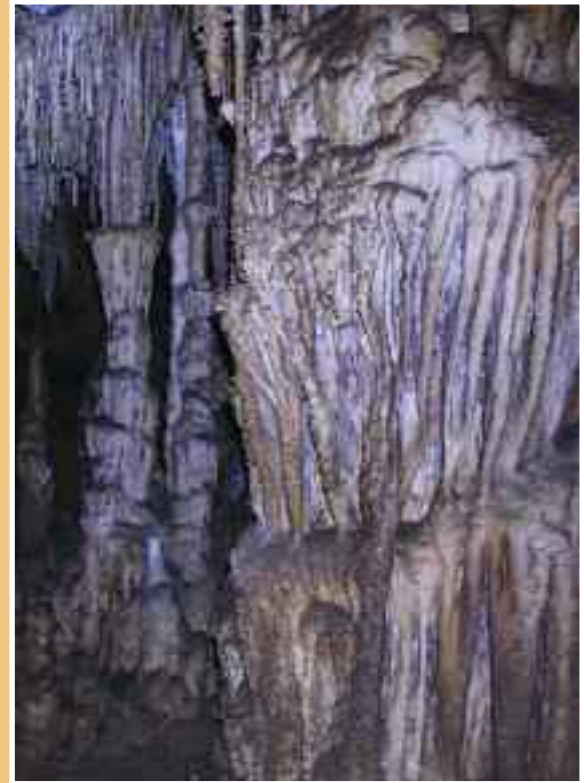


Fig. 3 Lithophones in Las Chimeneas Cave in Cantabria, northern Spain.

1.4 Wind from the Sky, Wind from the Earth. The Earliest Bone Pipes and Whistles

Carlos García Benito

Some of the earliest musical instruments discovered in Europe are bone pipes and whistles. These have been recovered at archaeological sites across the continent. The oldest examples date from the early Upper Palaeolithic (ca. 45,000-10,000 BP) – the Aurignacian period (ca. 45,000-35,000 BP) – and are associated with the first European communities of anatomically modern humans. Some of these instruments are also found throughout Prehistory and into the historical period, including contemporary folk traditions in Europe (e.g., among Spanish sephards), so it may be claimed that bone pipes and whistles have been in continuous use for over 40,000 years.

The aerophones that appear in the archaeological record are fabricated primarily from bone. There is a practical explanation as bone is both strong and durable in comparison with plant materials, which warp and degrade at a quicker rate. Although wooden examples of pipes are known, they are very rarely recovered from excavations due to the rarity of preserved organic remains. We have two such pipes, both made in Elder wood: the 42 cm long pipe from Charavines in France from Neolithic (ca. 2,600 BCE) and the flute of Hagnau-Burg in Germany from the Bronze Age (ca. 1,050 BCE). It is a possibility that, as in European traditional cultures and others, musical instruments were initially manufactured from organic matter such as wood and other plant materials. Prehistoric people may have subsequently decided to use bone because it is more durable. The bones used in the fabrication of these instruments are predominantly bird bones (primarily bones of predatory raptors) and are typically the ulna or radius of the animal. These particular bones were most likely chosen because they have an adequate size and a cylindrical shape and are completely hollow. However, we must not forget that the bones may have embodied a symbolic meaning. There are also other examples fabricated from the bones of larger mammals, usually herbivores. These include whistles made from

the toe bones (phalanges) of deer, reindeer and other mammals as well as perforated pipes usually made from the long bones of sheep and goats. There are also examples of these instruments that have fabricated from horn and antler.

The whistles of Prehistoric origin are crafted in a number of stylistic forms, with the most popular being the phalangeal whistles, which appear in the archaeological record beginning in the Middle Palaeolithic (ca. 150,000-40,000 BP) and are dispersed throughout Europe. These whistles usually functioned as Helmholtz resonators (i.e., sound was produced in the same manner as when a person blows over the top of an empty bottle), with a single hole allowing for the production of only one or two notes. Other very common whistles were produced from stag antler. A notable example was recovered from the Iron Age site of La Hoya in Spain (Fig. 1). The remaining artefacts are made from various sections of animal bones and have a bevelled hole or notch for creating the sound. Outstanding specimens of these were excavated at the Upper Palaeolithic sites of Roc-de-Marcamps in France and Davant Pau in Spain (Fig. 2).

Bone pipes can be categorised in two distinct groups: those with and those without perforations. There are non-perforated examples from the entire Prehistory. These have been in sets and also in isolation. Some scholars have interpreted those found in isolation as hunting whistles that could have produced up to two or three notes, but this is contentious as a variety of other functions can be attributed to the artefacts. Non-perforated bone tubes may have been, for example, components of blowguns, or they may have been storage devices or tools used in the production of paintings, snorting of drugs, or consumption of food. The bone pipes discovered in sets have been interpreted in some cases as panpipes, or *syringes*. Examples include artefacts from the Neolithic caves of L'Or and Sarsa in Spain and the Hallstatt Culture site – transition between Bronze and Iron Ages – of Przeczyce in Poland.

The perforated pipes constitute a large group of artefacts and encompass various kinds of aerophones. The classification of these pipes depends upon their mouthpieces; they are interpreted as end blown instruments (i.e., flutes), reed instruments (i.e., clarinets or oboes) or lip reed instruments (i.e., trumpets or horns). Accurate classification of the artefacts in question is often not possible as the archaeological remains are fragmentary and incomplete in many cases. Many artefacts are simply referred to as “flutes” or “whistles”. However, these terms may be erroneous because the mouthpieces of the majority of documented instruments are missing and only fragments of the instruments’ bodies have been preserved. Perforated pipes include the spectacular from Palaeolithic sites of Hohle Fels in Germany, Geißenklösterle in Germany and Isturitz in France or from Neolithic site of Dobokrai in Russia. There are also a number of perforated instruments that have been found with their mouthpieces more or less intact. The mouthpiece is identifiable due its size; it is a hole larger than the finger holes located at one end of the instrument, it may be semicircular, circular, rectangular or quadrangular in shape. These instruments can be categorised with relative confidence as either straight flutes (recorders) or transverse

flutes. Examples have been excavated at the sites of Veyreau in France (Chalcolithic, ca. 3,800 BP) (Fig. 3), Vesterbølle in Denmark (Second Iron Age, second-first centuries BCE) and Malham in England (Second Iron Age, second-first centuries BCE).

These kinds of aerophones are also documented, although the examples are scarce, in European Prehistoric art. One of the most striking pieces is a Palaeolithic engraving of a half-man, half-bison anthropomorphic figure playing what appears to be either a nose flute or a mouth bow (a chordophone). Scholars believe that the figure, engraved in the French cave of Trois-Frères (Fig. 4), is a depiction of a shaman or sorcerer. Other examples are seen in the post-Palaeolithic art of the Iberian Peninsula, known as “Levantine art” (art of eastern Spain). One of the most important is the scene interpreted as the “capture of live deer” (Fig. 5a-b) at the site of Muriecho L (Spain). Here, we observe four figures holding objects that appear to be flutes, clarinets or horns at the height of their heads and close to their mouths. Although certain identification of the objects as musical instruments is rather difficult, other figures in the scene that appear to be clapping, shouting, singing or dancing suggest that the objects are indeed musical instruments.



Fig. 1 La Hoya possible antler whistle.
Vitoria-Gasteiz (Álava, Spain), Archaeological Museum of Álava.



Fig. 2 Davant Pau whistle.
Banyoles (Girona, Spain), Regional Archaeological Museum.

Fig. 3 Veyreau flute (France). Reproduction for
Archaeomusica exhibition by Carlos García Benito.
Original : Paris, Musée de la Cité de la Musique.



Fig. 4 Shaman of Trois-Frères (France).



5a



5b

Fig. 5a-b Scene of Muriecho L (Huesca, Spain).

1.5 The Bullroarer. A Global and Timeless Sound Instrument

Cajsa S. Lund

Bullroarers are used, or have been used, throughout the world and through the ages, by populations in Africa, America, Asia, Oceania and Europe. Archaeologists have found them from Palaeolithic times and onwards in Europe, their existence in ancient Greece is documented, there is information in medieval texts, there are ethnographic and ethnological records, and they are still used in our modern societies.

Ethnological studies claim that the word “bullroarer” was itself of English folk origin and was universally adopted in 1880 as the scholarly term. There are a great many vernacular local names all over the world; at least around 650 have been documented in a recent study.

Description. A bullroarer can roughly be described as a thin, flat, oblong object, with a length of approx. 12-15 cm, shaped as a rectangle or an oval with a pierced hole in one end (in the central point) for a string (Fig. 1). This describes a ‘standard’ bullroarer; there are many different sizes, from ca. 6 to 80 cm, and also a great variety of shapes (Fig. 2). Some bullroarers have notches instead of a hole for fastening the string and some have a stick attached to the other end of the string, as a handle. Several ethnographic bullroarers are highly polished and/or decorated with painted or carved geometrical figures and other motifs. There are popular bullroarers in Europe with notches around the edges or with pierced holes all over the surface, and this affects the sound.

The main material used for traditional bullroarers appears to be wood. The archaeological finds, however, are of bone or antler. Another but rarer material is shale of which some finds in Norway were made, such as the Neolithic bullroarer from Tuv (Fig. 3). This has notches instead of a hole for the string, is 6.4 cm long, and is dated to ca. 2,800 BCE. We can make an assumption that wood was also the prime material in Prehistory but such bullroarers have not been preserved because of the perishable material.

The sound production. When the bullroarer is swung in large circles in the air, in front of the body or over the head, it will rotate rapidly around its own axis. Its edge thus sets the surrounding air in vibration, which causes the characteristic buzzing, or humming, or wailing, or roaring – you name it! – sound. At the same time the string is twisted. When the increasing twist halts the rotation, the bullroarer turns back and the string will untwist and subsequently twist in the opposite direction – until the whole process is repeated. Whenever the rotation stops for a moment, the sound will also die.

The timbre may vary with factors such as the material, size and shape of the bullroarer, the sharpness and the shape of the edges, the rate of rotation, the material and the length of the string, and the strength, endurance and expertise of the swinger.

The sound can be controlled and modulated by swinging the bullroarer more slowly (deeper sound) or faster (higher sound), thus making the coding of information possible. The low-frequency component of the sound travels long distances, and is clearly audible far away – imagine a soundscape on a quiet night and with many bullroarers performing together!

Multi-functional sound instrument. Bullroarers are used for magical as well as practical purposes, and for entertainment (especially as toys) but also as musical instruments, even in present-day orchestras. In ancient Greece the bullroarer was used in the Dionysian Mysteries.

An extremely wide variety of magical rites, functions and mythologies of the bullroarers is well documented worldwide from the 1800s and onwards. In several early indigenous cultures women and girls were not allowed to see or hear the bullroarers. The magical functions can roughly be summarised as weather magic, fertility rites, initiation rites, rituals having to do with death, as a means of achieving a state of trance, and of getting into contact with supernatural forces.

A fact of interest in this context is that the indigenous reindeer-herding Nenets in North West Siberia still used the bullroarer as a ritual instrument in the late 20th century. In Scania, Sweden, as late as in the 1940s, young men attracted bats with bullroarers. The animals were killed, dried, pulverised and then used for brewing an aphrodisiac potion. In Norway fishermen used traditional bullroarers as a magical protection against dangerous winds in the fjords but also as a signal instrument for gathering the local team of fishermen.

Practical functions of popular bullroarers are known, too, from several other countries in Europe, for example Poland, the former Czechoslovakia, Germany, Slovenia, Hungary, Sweden and Denmark where the roaring sound served to frighten away birds and animals, especially pigs, from plantations.

Today, in many countries, the bullroarer is chiefly a sound toy and preferably played by boys, using all kinds of objects, from a home-made bullroarer of wood or bark to a modern plastic ruler with a hole or a fishing sinker of metal. Boys favour the physical movement when swinging a bullroarer as well as its “tough” sound, like that of a motorbike or a car.

Archaeological finds. As mentioned above there have been archaeological finds of bullroarers, not least from Palaeolithic Europe, made of bone or antler. The problem is that we do not know for sure if the artefacts in question were indeed bullroarers. At least some may as well be netting or fishing tools, basketry implements, pendants, etc. One artefact that even “sceptics” indeed dare to interpret as a probable Palaeolithic bullroarer was found in the cave La Roche in Lalinde, France and is dated to ca. 14,000-12,000 BCE. This well-known find is made from a reindeer antler, is 16 cm long and decorated with geometrical incisions and incrustation of red ochre (Fig. 4).

Another well-known find is the ‘brummer’ from the Mesolithic settlement Kongemose in Denmark (Fig. 5). This is a thin propeller-shaped artefact of bone (probably red deer), 11 cm long and about 8,000 years old. Its identification as a bullroarer, however, is far from certain.



Fig. 2 Recent bullroarers of wood, made in Sweden by both children and adults.



Fig. 1 Traditional wooden bullroarer from Scania, Sweden.



Fig. 3 Neolithic bullroarer of black shale from Tuv, Norway. Reconstructed by Ake Egevad. The original find is of red shale.



Fig. 4 Replica (made by Jean-Loup Ringot) of the Palaeolithic bullroarer from La Roche, France.



Fig. 5 Mesolithic bullroarer from Kongemose, Denmark.

1.6 Beating the Mammoth. A Percussion Ensemble from Ukraine

Alexei Kosykh

A sunset – the hunt is over. The massive carcass of the killed mammoth rises up with its tusk to the evening sky and the birds. A large group of the hunters sit, stand and dance around the fire. This is *Stone Age: The Feast*, one of the several wall paintings created in 1883 by the famous Russian painter Viktor Vasnetsov in the hall of the State Historical Museum in Moscow (Fig. 1).

But the Palaeolithic humans killed mammoths not only for the meat, as suggested by the painting. They used their skins for clothing, and they built roundhouses from their bones. One of such hunters' sites consisted of five dwellings for fifty to sixty inhabitants. The site was discovered during archaeological excavations in Mezin (Mezyn), a village on the right bank of the Desna River in northeastern Ukraine.

The site occupied 1,200 square meters on the slope of the bank and dates back to the Upper Palaeolithic (ca. 20,000-18,000 BCE), the time of the last glacial period, which was characterized by a tundra-like environment in this region. Mezin pertains to the so-called eastern Gravettian toolmaking culture of the Cro-Magnons. These early modern humans hunted mammoths, lived in hunting camps (Fig. 2a-b), built mammoth dwellings and used, among other tools, flint burins and scrapers for cutting and the treatment of mammoth skins as well as bone awls and needles for sewing clothing. They also produced carved figurines from mammoth bone that depicted women with emphasized hips and breasts.

The Mezin Dwelling no. 1, which was analyzed in 1954-1956 by the fieldwork team of the Academy of Sciences of the Ukrainian Soviet Republic, is of particular interest for us. This circular dwelling (now displayed at the National Museum of Natural History at the National Academy of Sciences of Ukraine in Kiev) is 20 square meters in size. It consisted of a floor made from mammoth skulls and a frame made from tusks, which were presumably covered with mammoth skin (Fig. 3). Within the collapsed dwelling, a thighbone,

two lower jawbones, a shoulder blade, a pelvic bone and a fragment of a skull of a mammoth were found together with mammoth tusk, shells, reindeer antler and mammoth ivory artefacts (Figs. 4 and 5a-c). All the mammoth bones were decorated with ochre stripes and zigzags and are outstanding finds in the archaeological record of Prehistoric Europe. They must have been very special objects for the people of Mezin.

Not only painted decoration but also percussion marks were preserved on certain parts of the thighbone (80 x 20 cm), lower jawbones (53 x 50 cm), shoulder blade (57 x 63 cm) and pelvic bone (63 x 43 cm). These marks were presumably produced by heavy percussion with a beater, which was most likely a reindeer antler (3.5 x 30 x 18 cm) or a fragment of mammoth tusk (32 cm) found in the dwelling. The archaeologist Sergei Bibikov, who analysed the finds from Mezin, interpreted these bones as percussion-related objects used for musical activities. He also suggested that the Mezin Dwelling no. 1 was a special space for keeping these objects and the ochre pigments as both the bones and pigments were requisites for seasonal feasts. Subsequently, these finds became the subject of research undertaken by a team of specialists. These included specialists in archaeological wear patterns (Galina Korobkova from the Institute of Archaeology of the Academy of Sciences in Moscow), criminalistics and forensic trace evidence (Victor Berger from the Forensic Science Institute in Kiev and Anatoli Rubezhanski from the Medical Institute in Dnepropetrovsk), ethnomusicology and music archaeology (Riurik Sadokov from the Institute of Ethnography of the Academy of Sciences in Moscow), experimental archaeology (Yaroslav Shapoval from the Institute of Archaeology of the Academy of Sciences in Kiev), conservation and restoration (Clara Nikitina from the State Hermitage Museum in St. Petersburg) and Prehistory (Vladislav Gladilin and Larissa Soldatenko from the Museum of Natural History of the Academy of Sciences in Kiev), all of whom

worked under the direction of Bibikov. The team discovered that the mammoth bones in question are highly resonant, particularly where most of the heavy percussion marks are localised.

Bibikov divided the finds into “fixed percussion” (resonant thighbone, lower jawbones, shoulder blade, pelvic bone), “mobile percussors” (reindeer antler, mammoth tusk) and “shakers” (ivory bracelet). The sound properties of the original bones as well as comparable bones were tested during several experiments during jam sessions in 1976 and 1980. The recording made in the course of these experiments, in which the percussionist Vladimir Kokol’nikov of the Kiev Conservatory of Music performed, was released as a vinyl EP disk in 1981 by Soviet record giant Melodiya. Side A contains an introduction and some remarks made by Bibikov followed by samples of the sounds of the thighbone, shoulder blade, pelvic bone and lower jawbones produced by beating and scraping them with the reindeer antler. Side B is the recording of an ensemble playing on four mammoth bones. Since there are no depictions of percussion instruments or percussionists in Palaeolithic art, Bibikov could only speculate about performance techniques and the rhythmic patterns that were created with the Mezin percussion instruments. Both ethnographic comparison with contemporary indigenous peoples and the suggestion that some of the Palaeolithic female figurines made from mammoth bone may represent dancers were taken into account to get an idea of how the instruments might have been used. Of special interest is the *yaranga*, a round tent made of reindeer hide, traditionally used by the nomadic peoples of Arctic Russia. The *yaranga* served both as a dwelling and, for special occasions, as a place for making music and dancing.

A photo taken during the 1976 jam session with the mammoth bones shows the seated positions of the musicians (Fig. 6). On side B of the recording, we hear the beats and scrapes produced with the antler beaters and the shaking of the ivory “bracelet”, forming a rhythmic pattern in moderate tempo with the use of accents,

syncopation, dotted rhythms, dynamics (*crescendo* and *diminuendo*) and changes in tempo (*accelerando* and *calando*). The ensemble simultaneously played two rhythmic lines. Although this may be an entirely modern musical interpretation of the way the instruments were played in Prehistory, the recording nonetheless gives us an idea of how the bones were originally played and what they sounded like.

While the mammoth bone ensemble from Mezin is a unique archaeological find, there are related artefacts that have been found at other archaeological sites. These include Molodovo in Ukraine, Yodinovo and Kostyonki in Russia, where mammoth tusk beaters and bone scrapers were excavated, as well as Pavlov in the Czech Republic, where mammoth ivory figurines that appear to be dancing were found. The practice of using reindeer-antler beaters appears to have been a tradition that persisted for a very long time – from the Mesolithic through the modern era. Beaters made from reindeer antler have been excavated at Mesolithic sites in Skateholm, Sweden, and Vadbæk, Denmark and are still in use as drumsticks used by Saami shamans.

The interpretation of the artefacts from Mezin as musical instruments was criticised by several scholars such as Bo Lawergren, Olga Soffer, and Francesco d’Errico. Such criticism may stem in part from Bibikov’s anachronistic ideas (i.e., his referring to the ensemble as an “orchestra” and “sextet”). However, the idea that the mammoth bones were used as sound-producers is plausible. While Ian Cross, Ezra Zubrow and Frank Cowan called our attention to the flint-knapping process as a possible source of musical rhythm, Bibikov (and then Iain Morley, and Ludmila Lbova) postulated that sound was produced using the bones of mammoths as these animals constituted the main food source of Upper Palaeolithic hunter communities. As mammoths sustained human life during the Upper Palaeolithic era, it is conceivable that their bones were endowed with symbolic meaning and used to create sound.



Fig. 1 Viktor M. Vasnetsov's painting "Stone Age: The Feast" (1883). A sketch for mural painting at the hall of the State Historical Museum in Moscow. Oil, canvas. Moscow. Tretyakov State Gallery.

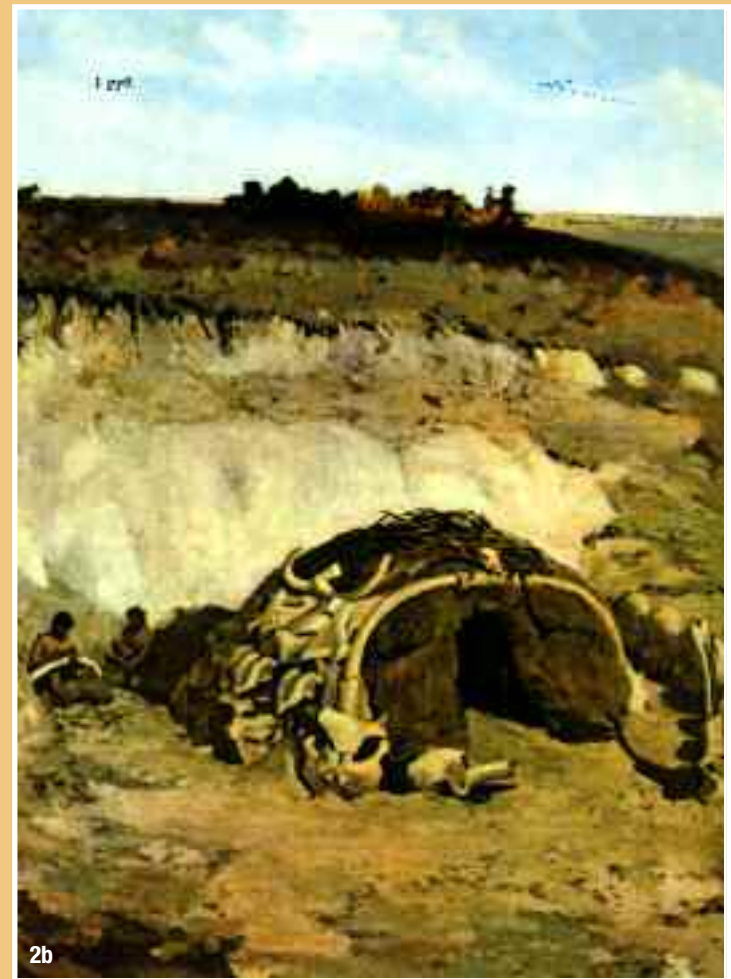


Fig. 2a-b Mezin Scene.



Fig. 3 Mezin dwelling n. 1 during excavation and reconstruction.



Fig. 4 Ornamented mammoth bones: two lower jawbones, a pelvic bone, a thighbone, a blade and a fragment of skull.



Fig. 5 Beater from reindeer antler.



Fig. 6 Mammoth bone jam session, Kiev 1976.

1.7 Bark without Bite. Animal Tooth Rattles from Stone-Age Burials around the Baltic Sea

Riitta Rainio

Strings of shells, bones and teeth are some of the most commonly found artefacts of earlier Prehistoric origin. These strung rattles are some of the earliest evidence of potential musical activity, and their presence in many graves of the Mesolithic and Neolithic in Europe points to their significance and importance in funerary and ritualistic aspects of Stone Age life. Archaeological evidence for the widespread use of tooth rattles comes predominantly from northern Europe (7,000-2,300 BCE), from burial sites in Sweden, Denmark, Germany, Latvia, Estonia and Russia. In these graves of hunter-gatherers, tooth pendants are the artefacts found in the greatest numbers. The rattles consist of strings of up to 150 individual teeth of various animals, such as wild boar, red deer, elk, fox and dog and precise excavation methods have enabled the original placements of the artefacts to be determined (Fig. 1).

Strings of teeth were placed on belts, worn as necklaces, sewn onto clothing as adornments and onto headdresses, aprons, bags and baby pouches (Fig. 2a-b). All the pendants are perforated or grooved and the teeth always hung from their root section. Microscopic analysis of the pendants suggest that these were not only utilised as part of a burial or funerary rite but were used during the lifetimes of the individuals, this being evidenced from the wear patterns that can be seen under a microscope on the surfaces of the artefacts. The areas around the perforation or groove (i.e., around the fastening loop) are often rounded and polished to a shine, which is suggestive of repetitive long-term use. Studying the teeth with a microscope also yields tantalising clues as to how the teeth would have been strung together. Additional wear patterns can be seen along the lengths of the teeth; these abrasions being thought to be the result of the percussive effects of teeth which were in contact with one another during use. This contact would have created a rattling sound, which marked the wearer's movements with rhythmic sounds. The pitch of this rattling sound

varied with the sizes of the teeth. By coordinating the timing of one's movements, it would have been easy to generate a musical pulse.

These artefacts are important cultural indicators as evidenced by their wide distribution and the great distances that some of the artefacts travelled. The animals from which a small group of the teeth are taken did not dwell near to the excavation sites, and teeth of aurochs, bear, elk and seals were sometimes transported overland or by sea, carried by trading expeditions or through networks of localised exchange cooperatives specializing in, among other things, culturally significant items. In this respect the tooth pendants are comparable to amber, flint and specific shell types which were circulated around the Baltic Sea area during the Stone Age. Furthermore, the interest in these rattles appears to have continued for a considerable period of time, probably over several thousand years. It is significant that such rattles were employed up to recent centuries in the work and cultural practices of non-industrialised societies and communities. We are well versed with the use of teeth, hooves, shells and bird bills in dance clothing from the Pacific Northwest of North America. Native Americans used rattling aprons, headdresses, mittens and necklaces in ceremonial and seasonal dances, which were major events in their communities. We also know that Siberian shamans, holy persons who played a central role in maintaining equilibrium between the physical and spiritual realms, used rattles and jingling noise-makers on clothing to either appease or repel certain supernatural forces. These amulets often had specific magical meanings that a shaman might employ as he or she manipulated the spirit world via sound. The use of rhythm and dance also provided a means of modulating physiological arousal and altering states of consciousness.

These tooth rattles are important because they provide a rare insight into the musical and acoustic practices of the northern Europeans of the Stone Age. Although the meanings of these

practices may remain somewhat obscure to us, it is easy to associate the strings of teeth with frightening forces, as exemplified by barking, growling or grimacing animals. The tooth pendants may have represented the forces or voices of the animals, and the movement of the teeth attached to clothing may have been thought

to animate the animal spirits. The fact that such mobile artefacts were continually laid in graves seems to suggest that the life after death was not meant to be completely motionless or silent. On the contrary, the deceased were obviously still moving or dancing in the afterlife.



Fig. 1 Grave 2 at Ajvide, Gotland, Sweden (ca. 2,700 BCE). Animal tooth pendants were found in a couple of overlapping rows between the thighs or knees of the deceased. Reconstruction in Gotlands Museum.



Fig. 2a-b Grave 6 at Skateholm I, Sweden (6,000-4,300 BCE), contained the body of an adult woman as well as the remains of a newly born baby intermingled with 32 perforated wild boar teeth. These could very well be the remains of a baby pouch with rattling tooth decoration.

1.8 Sounding Clay. Horns, Rattles, Flutes and Drums in the Neolithic

Arnd Adje Both

The so-called Neolithic Revolution, in the last phase of the Stone Age had great relevance for the manufacture and use of musical instruments. In the Periods before the Neolithic, i.e., the Palaeolithic and Mesolithic, the physical form of the natural materials used to make musical instruments played a key role in defining their finished morphology and, to a large extent, their playing characteristics. With the introduction of moulded and fired clay into the available range of materials, these restrictions were largely swept away. Thus, pottery instruments could be designed, made and experimented with and, in using the new plastic medium, new instrumental characteristics could be developed. We can see this process at work, for example, in the case of the Neolithic pottery horns which were found in Hungary and in caves in the Massif Central of southern France (Fig. 1). Their slightly curved shapes strongly resemble animal horns, suggesting that their precursors were of this form, although we have no evidence as animal horn is a perishable material. However, because of the malleability of the clay used, the funnel-shaped bell of these pottery instruments could be widened to produce a shape not found in any animal horn. The particular design appears to have been created as a means of intensifying the sound emitted, allowing it to be audible over a wider area.

Rattles and flutes, the latter less frequently in the archaeological record, are among the first-known pottery instruments in Europe, dating to approximately 5,000 BCE (Figs. 2-3). In the Neolithic they appear to have been restricted to various southeastern European cultures, but individual finds are also known from central Europe (a rattle from Roßleben in Thuringia, Germany). Many of these instruments have animal shapes, but the pottery rattles were also

given streamlined human forms, which are clearly female. There is evidence for domestic ritual use and the use of these instruments in funerary contexts. Finds in settlements and graves suggest that they were available to all social groups.

A significant Neolithic find assemblage is comprised of pottery drums, which were common between 3,500 and 2,200 BCE, especially in central European cultures, although there are also a few northern European finds from southern Sweden and Denmark as well as occasional finds from southeastern Europe. These instruments vary in shape and size. They are usually characterized by an open-ended base and a neck flaring upward, with hook-like projections and perforated knobs or rings attached at regular intervals to the upper edge (Fig. 4). These additions were probably used to stretch the drum skin tightly over the drum body. Being perishable, no skins have survived, only the drum bodies being found. Sometimes a handle is provided on the side of the instrument, suggesting that these drums might have been suspended. This is a common phenomenon on drums worldwide as suspension leaves the hands free and also allows the performer to dance or march in processions with the instrument. Many of the Neolithic drum finds are decorated with symbolic markings ranging from simple motifs to complex elements. Some of this decoration resembles megalithic art or motifs found in Scandinavia on the shamanic drums of the Saami. The finds come from settlements as well as graves, which strongly suggests that they must have been important for long periods of time and in use in a variety of contexts. Most of the instruments appear to have been intentionally broken and ritually deposited, suggesting a ritual use.



Fig. 1 Neolithic pottery horn of southern France (3,000-2,500 BCE).
Rout (Hérault), Grotte des Trois Chênes.



Fig. 2 Rattle in turtle-shape, Măgura Gorgana, Pietrele, Rumania
(4,350-4,250 IBCE).



Fig. 3 Rattles in pig-shape, Măgura Gorgana, Pietrele, Rumania
(4,350-4,250 IBCE).



Fig. 4 Drum from GroBeibstadt,
Germany (Bernburger culture, 3,200
BCE) and reconstruction.

1.9 Sounds from the Sea. Prehistoric Shell Trumpets

Gian Maria Di Nocera, Francesco Marano

The beautiful shell known as *Charonia lampas* or *nodifera* is the largest gastropod in the Mediterranean. Measuring 30-35 cm, sometimes up to 40 cm, it is found on rocky sea beds at a depth between 8 and 50 metres over a vast area, including the North Sea, the Atlantic Ocean, the Mediterranean Sea, and the Indian Ocean. The shell is notable for its white-greyish colour with brown “flames”. From Pre- and Protohistoric times onwards, it has been worked into a sound-producing tool: a hole being first cut into the shell along one of the spires (forming a lateral hole) or, more frequently, near the apex, which is subsequently removed (forming an apical hole). By blowing air through the hole while vibrating the lips against the mouthpiece, a standing wave is created in the air inside the instrument, thus producing sound in the manner of a trumpet. The presence of an artificial opening suitable as a mouthpiece is generally taken as sufficient proof that an archaeological find of a shell was used for producing sound.

In ancient communities living along the coasts of the Mediterranean, it was probably quite common to collect conches directly in the sea – in zones with shallow sea beds, or else along the beaches. Numerous specimens have been found at eastern and central Mediterranean sites, with the greatest number coming from the Arene Candide cave in Italy (Fig. 1) and, above all, the island of Crete, where the sites Knossos, Phaestos and Myrtos stand out.

Shell trumpets have been present in Europe since the Upper Palaeolithic, though only a single example is known from this period, this being found in Magdalenian levels in Marsoulas cave in France. A larger number of shells date to the Neolithic era, particularly those found in Liguria in Italy. Most *Charonia* trumpets there were found within burials, especially those of infants. Unfortunately, the relevant excavations were carried out long ago, so the available information is incomplete, especially with regard to the context and chronology. From the Arene Candide cave alone, eighteen shell trumpets were

retrieved. Some evidence of Neolithic shell trumpets has also emerged outside Liguria: a *Charonia nodifera* with removed apex being found in a burial at the early Neolithic site of Su Carroppu in southern Sardinia (sixth millennium BCE). In the Grotta dei Piccioni (Abruzzo), an extremely interesting site with stone circles and burials, including some of infants, was uncovered. There, a *Charonia* shell has been found, covered in red ochre, with its apex removed plus a small hole cut into the side. The grave goods found in these burials are particularly rich, especially in pottery but also with significant lithic industries and bones. Some authors have suggested that these aerophones were used in cult contexts. As the instruments are often found where infants have been buried, they have been interpreted not only as musical instruments, but also as objects connected to burial rituals. Of the shell trumpets from Neolithic levels at Knossos, Crete, not all were found in tombs. Particularly noteworthy is a shell with removed apex from Germany, found near Wolfenbüttel, much farther north than all other examples. It formed part of a hoard pertaining to the *Linienbandkeramik* culture, together with several items from the lithic industry, most of which had been inserted into the shell.

Shell trumpets continued to be used in the Chalcolithic period, with examples found in Hungary. Throughout the metal age, they continued to be used in the Mediterranean region, and especially around the Aegean. Indeed, there is further evidence from Crete, especially from the Myrtos site, where several *Charonia* shells were found in the early Minoan levels. In addition, a *Charonia* with a modelled apex, interpreted as a trumpet, was found in a post-Palatial building at Kephala (1,400–1,200 BCE). Finally, three small replicas of shell horns in *terracotta*, painted in red and white stripes and dating back to the Middle Minoan period (1,800–1,700 BCE), and a more recent shell with a modelled apex dated to 1,500–1,450 BCE have been found in a shrine at Knossos.

Some shells from Cyprus are associated with a cultic context, the most ancient dating to the Bronze Age. It was found in a rectangular enclosure, which was probably used for religious purposes, at Hala Sultan Tekke. Other shell trumpets have been found at the sanctuary of Kition. A *Charonia* shell with a removed apex was found in a *thólos* tomb dating back to the Late Helladic period in Peristeria, Messenia. A *Charonia* trumpet was found in Tomb 1 of the Poggio dell'Impiccato necropolis in Tarquinia, dating to the first half of the eighth century BC. This shell, with a clearly cut apex, had been laid near an urn. Other notable Pre- and Protohistoric shell trumpets have also been found at Tell Qasile and Tel Hazor, both in Israel. At Tell Qasile, a *Charonia sequenzae* with a modelled apex was situated in the latest levels of the Bronze Age. At Tel Hazor, a *Charonia* with a removed apex was found in the levels dating to the end of the ninth century BCE.

The use of large shells to generate sounds continued in the historic period, one example being a find from Motya, Sicily (fifth century BCE). This artefact was probably associated with the nearby sanctuary of Kothon. It is still difficult to trace the exact contexts in which these shell horns were used, even though the historical era provides more information about their possible contexts (see chapter Phoenician and Punic conch trumpets).

Written sources, for instance, indicate that these instruments were used to give military and naval signals probably linked to fishing activities. A connection between Triton's trumpet and the religious world, which seems plausible for the Motya find among others, also emerges in some modern manifestations, as in the procession of the Madonna of Piedigrotta in Naples, during which the shell horn is blown. Archaeological contexts also suggest that there may have been a deep link between this instrument and the religious sphere during Pre- and Protohistoric times, when the shell trumpet may have been attributed a "magical" value. Curt Sachs has already pointed to some communities of Madagascar, where the shell horn used to be blown on the occasion of funerals, the evocation of the dead, healing ceremonies etc. *Charonia* shell horns are also still used during religious festivals in India, Japan and Tibet; in the Fiji islands and in the New Hebrides, such horns were blown during sacred drinking rites. In India they were sounded at times of sowing and harvest. Apart from serving as a sound tool in sacred contexts, shells have also been used, in original or modified shape, as a vessel for libations



Fig. 1 Trumpet from *Charonia lampas*.
Arene Candide, Italy.

1.10 Green Instruments. The Sounding Herbarium

Cajsa S. Lund

Summertime. You are wandering through a meadow, anywhere in Europe. You pick a dandelion, remove the flower from the stem and pinch it at its larger end. Now you have got a wind instrument. You can also pluck a blade of grass, clamp it between your thumbs, and make whistling and squawking sounds when you blow on it the right way. The meadow is actually full of raw material for “green instruments”.

Wherever you are, there are almost always plants that can be used for making green instruments: from low down in the plains to high up in the mountains, in meadows, by the sea and lake shores, in pastures, in the woods, by roadsides, in dry, sandy soil, and of course, on cultivated land (Fig. 1).

When you walk along the beach, you might pick up some brown seaweed called bladderwrack, or *Fucus vesiculosus* in Latin, and pop the air bladders; they make a loud noise when they burst. You can do the same with the white snowberries (*Symphoricarpos albus*) in your garden.

At the lake shore, you can cut off a section of reed, about 12-15 centimeters long, close to a node, or “knee”, so that the reed has one open end and one closed end. Cut a vibrating “tongue” near the closed end of the reed and you obtain a simple clarinet (Fig. 2). An oat straw or a hollowed-out fig or laurel stem can also be used to make an instrument.

A wind instrument, such as a flute, clarinet or trumpet, can be produced from a length of elder branch, whose soft marrow is easily removed. Flutes can be created from naturally hollow stems, such as dried stems from knotweed, knotgrass, bistort, tearthumb and smartweed. Such stems have nodes, or “knees”, like bamboo or reed, whence the Greek term *Polygonum*, “many knees”, for the plant family. You blow into such a flute as you would blow into a bottle, and a row of different-sized flutes like these will make a panpipe (Fig. 3). But do not use the stem of *Heracleum sphondylium* – commonly called eltrof or hogweed in English – as it can cause burns on your skin.

Making willow or birch-bark whistles is a springtime activity, when the sap rises and the bark comes off easily (Fig. 4). This was a

common tradition in our pre-industrial societies and it was usually connected with various ancient magic rites. The following story from Sweden dates back to the mid-18th century: “In the spring we fetched water from a stream that flowed southwards. The water was taken where it murmured the most loudly. Then an adult would blow into the water with a willow flute that a child had used. The child had to drink this water for three days on an empty stomach. This would ensure that the child would have a very good ear for music”.

There are also a variety of dried seedpods that can be used as rattles; hazelnut shells as well as the stones of cherries and other fruits, can be turned into whistles (Fig. 5); even a hollowed-out carrot or a simple piece of bark can become a trumpet.

Many early texts recount how simple sound instruments were created from different plant parts, usually spontaneously and just for the day, from the Roman poet Virgil (70-19 BCE), whose bucolic shepherds make music using oats, to various folkloristic books and ethnological records from all over Europe.

We know that in early days green instruments were used not only for pleasure, but also for utilitarian purposes. Whistles of kerns or hazelnut shells were excellent signal instruments for communicating across long distances. By blowing on a leaf wedged between the thumbs, hunters could imitate a red deer or hawk, and a baby’s braided birch-root rattle with pebbles inside would keep goblins away. The making of bark and willow whistles would traditionally be accompanied by rhythmic chanting and singing that acted as a kind of spell. All these are vestiges of ancient rites of spring.

Various types of green instruments were certainly produced and used in our Prehistory as well, but almost invariably they are lost to us. Only in a very few particularly favourable environments such instruments happen to have been preserved. One example is a collection of around thirty pierced hazelnut shells from the hunter-gatherer Stone Age, found in a bog in southern Sweden. Threaded on a string they might have served as a rattle - but no string was preserved, as it was probably made of rawhide, animal tendon or another perishable material (Fig. 6).



Fig. 1 Green instruments.



Fig. 2 Reed pipe.



Fig. 3 Panpipe of plant stems.



Fig. 4 Bark whistle.



Fig. 5 Kern whistles.



Fig. 6 Rattle of hazelnut shells. Free reconstruction by Åke Egevad of a Mesolithic find from Scania, Sweden.





Instruments through the Ages

2.1 Gentle Sounds from the East. String Instruments in Antiquity

Ricardo Eichmann

Wind instruments are known from early in Europe's Late Palaeolithic era, some 40,000 years ago. Stringed instruments, by contrast, were apparently added to the inventory of musical instruments much later. No archaeological or iconographic evidence for their presence exists, before the early Bronze Age in West Asia, namely in the Levant and Mesopotamia (mid-fourth millennium BCE).

The precursors of stringed instruments may well have been musical bows, such as are employed in some cultures up to the present time. It is likely that these instruments were originally hunting bows, which were probably already known in the later Palaeolithic. In African cultures musical bows are used in performances which serve to strengthen a group's social cohesion. In Namibia, for example, they accompany "story songs", songs which explore issues in personal or public life, relating to hunting or cattle breeding. A standardized song repertoire does not exist; instead, the songs are the improvised result of direct communication between the musician who relates the stories and his listeners. The group reacts to the singing, thereby inspiring the musician. With such performances, both musician and audience reinforce the social bond necessary for organizing the group's life. Because of its low volume, the musical bow is most suitable for entertaining small groups, and the rhythmic characteristics of the instrument outshine the melodic ones.

To date, there is no clear archaeological evidence for musical bows in the ancient Near East or Europe. Highly debated are a representation of what might be a musical bow in a cave in the French Pyrenees (Trois-Frères; Late Palaeolithic) and fragments of wooden bows from Ageröd, Sweden, (Mesolithic) and the Molina di Ledro pile dwelling in Italy (Bronze Age).

More complex stringed instruments are attested in the

second half of the fourth millennium BCE in West Asia, being represented on painted pottery, carved reliefs and seal impressions. These instruments are harps (Fig. 1). Occurring in various contexts, some of the earliest types are bow harps and triangular harps, respectively indicated by a bow-shaped form or a basically-triangular frame construction. The earliest pictorial representations show bow harps with three to five strings. In one depiction from Choga Mish, Iran, such bow harps are being played as part of an ensemble accompanying a banquet; the ensemble also including a singer, a drummer and someone playing a wind instrument. The second type of harp, the triangular harp, is included in a depiction from late fourth millennium BCE from Megiddo, Palestine; this showing a standing musician holding a triangular harp which appears to have nine strings. This unique depiction was engraved on a 42 cm by 21.5 cm paving stone near an altar in a sanctuary. Such early images of stringed instruments appear in scenes depicting ritual practices which took place in representative, administrative and religious contexts.

In the course of the third millennium BCE, lyres begin to appear in the inventory of depicted stringed instruments. The most outstanding examples are the so-called bull lyres (Fig. 2), which frequently appear in Mesopotamian iconography and were played on prestigious and official occasions, such as banquets. These instruments belonged to the Sumerian civilisation and were basically constructed of wood, which may have been decorated with precious materials. Instruments of this type with bull heads made of precious metals (gold, silver) were excavated from the royal cemeteries of Ur in southern Mesopotamia. They may be considered to have represented significant elements of Sumerian identity. Like the burial rituals they took part in they were characteristic of a new era in southern Mesopotamia which began in the late fourth

millennium BCE and was dominated by the appearance of cooperating, competing and sometimes warring city states. Many innovations date to this time, including copper working, writing, bureaucracy and complex architecture. Organised music-making was obviously one aspect of such innovative activity.

From that time onwards, musicians and musical instruments were an essential component of religious practices throughout West Asia, being employed particularly to communicate with the gods and to maintain the welfare of the state. By the first millennium BCE, at the latest, lyres were widespread throughout the region, including the Mediterranean area. They appear, for instance, in the context of a cult scene depicted on a Mycenaean sarcophagus from Hagia Triada (Crete, mid-second millennium) and in the hands of metal figurines from the first half of the first millennium BCE (Crete).

Another important member of the ancient West Asian string instrument inventory, was the lute, images of which appear at the end of the third millennium BCE (Fig. 3a-b). Lutes are characterized by strings running parallel to a string bearer and the sound board, which was usually covered with animal hide. In the case of lutes, the number of different tones that could be produced no longer depended on the number of strings as each string was capable of producing a multitude of notes when the strings were stopped with the fingers at different points, thus reducing their vibrating length. Although ancient West Asian lutes usually had only two or three strings, they had a range that exceeded an octave.

Cuneiform texts provide convincing evidence that ancient musical scales had seven steps to the octave and could be variously structured for producing several modes. Extant instruments indicate that some lutes may have been equipped with frets and moving these to different places would have allowed the preselection of the notes of particular scales. At their upper end, the strings were attached with the help of cords

wound around the neck; to tune the basic note of a string, those cords rolls were pushed upwards or downwards.

Lutes first appear in images on stone cylinder seals dating to approximately 2,200 BCE during the so-called Akkadian Period. One of those seals belonged to a professional musician (*nar*), whose name Urur is inscribed in cuneiform (Fig. 4). The earliest known depictions of musicians with lutes appear (as do those of musicians with other types of instruments) in mythological contexts along with gods and demons. It is possible that the images on the seals indicate the duties of the musicians, namely singing songs relating to myths to the accompaniment of their instruments. In the third millennium BCE musicians appear in detailed lists of professions. They include musicians responsible for ceremonies (*nar*) as well as those who performed exclusively cultic duties. Both underwent several years of training and were employed in palaces and temples.

In the third and second millennia BCE, musicians and musical instruments, including lyres and lutes, were widely distributed by the political elite through palace-controlled overland and maritime trade networks. Instruments, and in some cases, musicians themselves were sent as diplomatic gifts. Around the 14th to 13th centuries BCE, such practices led to the development of an “international” style in the royal and elite cultures of Asia Minor, Mesopotamia, Syria and Egypt. It included luxury objects with stylistic and iconographic features that were found across political and cultural borders. Through maritime trade, such goods circulated in the Mediterranean, reaching the Greek world as evidenced by the cargo of the Uluburun shipwreck south of Turkey – which also included a trumpet made from a rhino horn.

However, musical practices and musical instruments alien to the Greek world do not seem to have been valued everywhere. At least in pre-Hellenistic Greece, there are no indications of the employment of lutes. Lyres were apparently preferred and deemed to be fully adequate for musical life. This changed only

at the time of Alexander the Great, whose campaigns in central Asia possibly contributed to the popularisation of lute-playing in the Mediterranean area. From then on, club- and box-shaped necked lute constructions were common in the Hellenistic world as well, likely called *pandoura*; these were further developed in Roman times and late antiquity (Figs. 5-6). Strings were now adjusted with tuning pegs and the sound box covered with wooden soundboards, such as in the case of the so-called “Coptic” lutes from Egypt (Fig. 7a-b). During the fifth to eighth centuries CE a lute type emerged in pictorial representations on luxurious floor mosaics and wall paintings all around the Mediterranean (Fig. 8), several examples of which came to light during excavations in Egypt. Apparently, the sociocultural

musical practices of Hellenistic times led to the widespread dispersal of this instrument type. Awareness of these instruments spread northward across the Alps by means of Psalter illustrations (Fig. 9).

In antiquity, string instruments constituted an integral part of the cultural and political identity of the elites. As far as we know, they also contributed to the development of civilisation in Mesopotamia during the Late Bronze Age at the latest, in Europe in the course of the following centuries. The instruments – lyres and harps in the case of ancient Mesopotamia and lutes in Islamic times – were also used to explain and comment on music theory.



Fig. 1 Representation of a harp player from a seal impression from Chogha Mish, Iran (second half fourth millennium BCE).

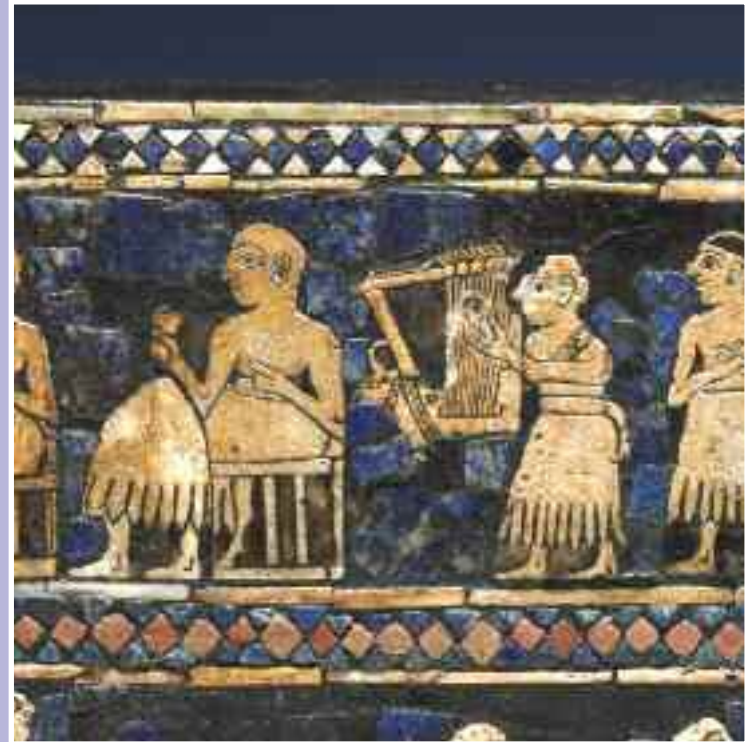


Fig. 2 Representation of a lyre player on a decorated lyre soundbox(?) from Ur, Iraq (middle of third millennium BCE).



3a



3b

Fig. 3a-b a. Remains of a two-stringed lute from a tomb of the 18th Dynasty (16th /15th century BCE) in Deir el Medina, Egypt. Egyptian Museum Cairo / b. Reconstruction by Susanna Schulz.



Fig. 4 Representation of a lute player (left) from a seal impression from the Akkadian Period in Mesopotamia (2,300 BCE).



Fig. 5 Representation of a lute player in a relief from Mantinea, Greece (fourth century BCE). National Archaeological Museum, Athens.



Fig. 6 Representation of a lute player in a relief from Merida, Spain (first century CE).



Fig. 7a-b Coptic lute from a tomb in Saqqara, Egypt (fifth-eighth century CE). Cairo, Coptic Museum. b. Reconstruction by Susanna Schulz.



Fig. 8 Representation of a lute-playing bear. Wall painting from Quseir el 'Amra, Jordan (early eighth century CE).



Fig. 9 Representation of a musician with a lute. Illustration from the Utrecht Psalter (820-835 CE). Utrecht, University Library, Ms. 32, fol. 25r.

2.2 Warriors and Bards. The Dominant Lyre

Stefan Hagel

It was in the High Middle Ages when the precursors of the violin became widely prominent in Europe. Played with a bow and therefore capable of producing loud and sustained notes without blocking the player's mouth, this new kind of lute quickly earned the favour of singers. So they discarded the instrument which had formerly distinguished their profession, for ages beyond memory; the history of the European lyre was coming to an end. Usage of the instrument retreated eastwards and northwards, with the last survivors, assimilated into an entirely different playing context, found in 20th-century Siberia.

This story of rapid obsolescence many centuries ago stands in a curious contrast to the lyre's unbroken presence as a pan-European cultural icon. In strangely unhistorical forms, lyres supposedly resembling instruments of Classical Antiquity are the dominant symbol for musical culture, decorating not only opera houses, concert halls and other musical instruments, but also books, furniture, jewellery, and even animated television ponies.

Of course, Europe has always acknowledged its common cultural heirloom when looking back to ancient Greece and Rome. No contemporary instrument would ever have been able to express a lost ideal of primeval musical harmony as fittingly as one whose sound was lost as well, while it was at the same time associated with the legendary poets, when, at the dawn of European history, poetry and music had formed an unbroken whole. It had been to the sound of the lyre that Homer had sung the battles of Troy and the wanderings of Odysseus, and Sappho, the longings of love; way back in mythical times, Orpheus had soothed the creatures of the wild and Amphion built the walls of Thebes with it. From the Greek model, poets composed *lyric* poetry in many languages, just as the word and concept of *music* itself was almost universally adopted from the Greek.

However, the lyre was by no means associated especially with the Greeks, and though they held it in the highest esteem, the same was also true of other peoples in the Mediterranean as well as the

Near East and toward the North. About the actual age of the instrument type, we know nothing. Lyres are generally made of perishable materials: a soundbox with two arms joined by a crossbar, all normally made of wood, with gut strings running from the bottom of the instrument over a bridge, through the open space between the arms up to the crossbar, around which they were fastened and tuned. Like many other instruments, such a construction would survive in the soil only under the most favourable conditions. Therefore, we normally know of the lyre's presence only where it was either depicted in lasting artwork or deposited in tombs: lyres popping up here and there, according to the development of artistic expression and subject to the representational preferences of its patrons. All the more is it fascinating how all these mosaic pieces start to form a larger picture, in which we can discern at least three distinctive forms of lyres from the outset. Near Eastern specimens of various sizes tend to have a flat bottom and diverging arms; this is already true of the famous large instruments with a bull-shaped body from Sumeria, and equally of the small flat ones found between Syria and Egypt. In contrast, from the Aegean eastwards through Italy, Spain and parts of France, lyres usually sport a round base and parallel arms – though around the seventh century BCE the Greeks adopted a flat base for their typical concert lyre (“*kithára*”). In the north, a series of Late Antique and Early medieval graves in Germany and England have yielded the third distinct type, long and slender, with a knob for fastening the strings at the rounded bottom. Closely related forms turn up in medieval images. We would associate this type with Germanic peoples and perhaps regard them as derived from Roman models were it not for an isolated representation of the same shape in the hand of a Scythian from the fourth century BCE, predating the earliest “Germanic” find by half a millennium. Seeing how stable particular forms may remain over many centuries, we are in no position to assess their Prehistoric development, let alone trace it back to a hypothetical common origin, which may have been

at any point between the Stone Ages and the third millennium BCE.

Although lyres of different cultural pedigree have occasionally met and sometimes been played together, one would normally have remained aware of their various forms' strong ethnical associations. Famously, a Latin poet of the migration period imagines how different peoples would extol his patron in song:

*Romanusque lyra, plaudat tibi barbarus harpa,
Graecus Achilliaca, crotta Britanna canat.* (Venantius Fortunatus 7.8)

“Let the Roman praise you to the *lyra*, the Barbarian to the *harpa*, the Greek to the *Achilliaca*; let the Briton *crotta* sound”.

These instrument names at the time all denote forms of lyres, although it is difficult to pin down the shapes meant by the Roman *lyra* (after all a Greek word) and the obscure Greek *Achilliaca*. The Germanic *harpa* would have been the slender instrument, and the Celtic *crotta* probably a more rectangular variant. These latter two references serve to show how instrument names often survive even when the instruments themselves have disappeared. In this way a culture manages to preserve the traditional prestige associated with a name, creating a seeming continuity in spite of historical changes. So the *crotta* ceded her name to the modern *crwth* or *rote*, and the *harpa* to the harp, just as the Greek *kithára* linguistically spawned guitars, citterns, chitarras, gitterns and zithers.

The case of the harp is of special interest, because it is associated with King David in the Bible, a figure of immense importance as embodying the ideal Royal saint and poet-instrumentalist. However, the modern idea of David as an actual harpist was only caused by the change in meaning. Ancient and early medieval depictions show him as a lyre player, and this is also the biblical background. There, the figure of David, apart from his role as monarch and founder of a lasting dynasty, resonates with archetypes of healer, warrior, lover and outlaw. A modern reader

may be puzzled by the seeming contrast between the skilled musician soothing King Saul's mental affliction and the shepherd confronting and slaying Goliath. For many ancient cultures, however, these were just two aspects of a model leader or aristocrat. Already the Sumerian king Šulgi praises himself for his exorbitant musical abilities no less than for his skills in warfare and other royal occupations, setting a model for Near Eastern cuneiform cultures. Prior to deciphered European texts, a Cypriote vase from the Early Iron Age, perhaps a bit earlier than the historical David, gives an example of elite self-representation on that island: a warrior, distinguished by helmet and sword, presents a typical Mediterranean lyre. Perhaps the plectrum-strummed lyre, where the right hand gives the rhythm, while the fingers of the left damped and plucked the strings, was especially suited for sword-fighters whose right hand was much more likely to be maimed than the shield-protected left? At any rate, the instrument is associated with some of Europe's outstanding epic heroes. Homer depicts Achilles, king of the Myrmidons and deadliest fighter before Troy, as enjoying himself with the lyre, singing the deeds of men. Similar iconic figures are encountered at the other end of Europe, where Germanic and Celtic peoples upheld olden warrior ideology until the Middle Ages. So King Gunnar, in the Nordic variant of the Niflung myth, famously uses his lyre to put the beasts in Attila's snake pit to sleep. More grimly, in the aftermath of the Second Battle of Moytura, the Irish hero Dagda goes to retrieve his lyre from the enemy, and when he magically summons it across their hall, it kills nine men on its way. He subsequently manages to escape by enchanting the remaining enemies with tunes of sorrow, of joy and finally of sleep.

The lyre's magical properties also point to its cultic function. The instrument was widely used in temple orchestras in the Near East, most prominently in the Jerusalem temple. Some hundred kilometres north, in Ugarit, it was itself awarded divine honours. In Greece, it was ever-present among the gods as Apollo's main attribute along with the bow. Accordingly, among men it provided

the typical accompaniment for hymns as well as paeans – songs of healing whose name derives from the older physician god Paiēōn.

And of course there was the bard: a professional musician, either attached to the court of a patron or travelling the lands. He praised the deeds of the living and their forefathers alike, creating the idealised history of an epic past, but also preserving traditional knowledge in his verses. His art ranged somewhere between verbatim memorisation and free improvisation in a formulaic language, as has also been observed in recent traditions. However, many European strands of epic song have disappeared together with the minstrels' traditional instrument, while a few have adopted new ways of accompaniment. Nowadays, lyres are thriving only south of the Mediterranean, in Arabic countries and large parts of Africa, with tunings that differ from those which had been in use from Sumeria to our Middle Ages – and anyway in regions outside the scope of this book.



Fig. 1 Lyre (*kithára*). Reconstruction based on iconography: S. Wallace and S. Hagel.

2.3 Breathing Fear and Awe. Trumpets and Horns through the Ages

Peter Holmes

The first brass instruments to appear in Europe were the Conch-shell trumpets, doing so around the Mediterranean in the Upper Palaeolithic Period, around 17,000 BCE. However, some are also found in central Europe, many hundreds of miles from where the original animal lived, indicating that these were seen as valuable objects and were most-probably used in key rituals.

Natural animal horns were probably also used as sound tools about this time but, of them, no traces remain. However, we do know that, by the time such instruments appear in the archaeological record, horns had acquired mystical associations, being related to Gods of hunting, birth and rebirth and the female; they remained ritual instruments well into the Roman Period and beyond.

Non-horn brass instruments emerge from the mists of antiquity around 2,500 BCE in the form of a single piece of iconography from Saqqara in Egypt. It seems improbable that trumpet-like brass instruments made of natural materials would not have been in use before that date, but none have survived the ravages of deposition. At any rate, sound tools made of natural materials such as horn, bone, wood, clay and animal shells are still in use today.

To piece together the story of musical instruments, music archaeologists have to rely, in addition to the relatively few physical remains, on iconography, ethnographic studies and literary sources to create a coherent picture. It emerges that the Prehistory of musical instruments was not one of steady development up until today, but one where a particular instrument, which was tightly integrated into a society's culture, could be developed both technically and organologically only to disappear without trace when that culture disappeared.

A perfect example is the so-called 'bronze lur', the exquisite bronze horn from the end of the North-European Bronze Age. Being a natural horn to all intents and purposes, it was basically a sort of tenor horn. One pair of lurs from Brudevaelte are six feet seven

inches long, which is almost identical to the modern tenor horn's six feet six inches. Also, the lur's mouthpieces, cast integrally with the mouthpipe, have a cup of very similar form to the modern tenor horn's. About 500 BCE, however, this Prehistoric sibling of the tenor horn, disappears from the record (see also article 2.4).

A modern player might look at these simple sound tools and wonder, because of their limited acoustic potential, how they might have contributed significantly to the rituals of their time. However, while we might see brass instruments as the tools of the musician, in the Stone and Early Metal Ages, in a world inhabited by all manner of spirits, they were seen as tools of those very forces. In some parts of the ancient world, all loud noises were looked upon as emanating from supernatural sources and the trumpet emerged very early on as possessing special powers, allowing it to take control over otherwise uncontrollable forces. As the loudest human-made sound, the voice of the trumpet ranked alongside thunder and the sound of violent earthquakes and was seen both as a communication from the celestial sphere and an apotropaic device for warding off evil spirits and dangerous forces. At times, the instrument became the voice of the God, at other times a tool of the priest to summon the God or their power or protection. In this context, its shape may be governed more by symbolic associations than musical needs. For instance, the silver trumpet of Tutankhamen (1,350 BCE) (Fig. 1) and its insert was in the form of, and carried the decoration of the lotus leaf, the symbol of rebirth and resurrection. In addition, the silver, a metal of the temple, may have been conceived as bestowing it with a great power. Such power still resonates much later in Christian eschatology – compare only the verse from the Bible which Handel so famously set to music in his *Messiah*: "The trumpet shall sound and the dead shall be raised, incorruptible".

The brass has also been associated with warfare. The trumpet-like instruments took on a role in battle and thus became the marker

of military and social status, a signifier which was transferred to rulers and, perhaps only secondarily, to priests.

The iconography and disposition of finds of horns and trumpets in the ancient world frequently shows recurring combinations of instruments. For instance, side and end-blown Irish Horns appear together, as do right and left-wound bronze lurs, the Etruscan *lituus* and *cornu*, the Iberian trumpet/horn and *aulós*, and the Roman *tuba* and *cornu*. Such a duality of different complementary forms gives rise to the idea of there being a force at work in these communities which sees such complementary duality as fulfilling a ritual role. There is a number of possible candidates for the complementarity but gender is one which has resonance both with instrument forms, representations, and with the needs of the societies which utilised the instruments.

In the northern regions of Europe, metal decorative elements have survived from the Bronze Age which had been attached to animal horns. Typically, pieces were added to the tip of the horn as early manifestations of the mouthpiece, to the bell end, forming a garland, and in the centre, forming a predecessor of the boss. Early fully-metal instruments survive from Ireland and the Baltic/Scandinavian Region from around 1,500-1,000 BCE, being clearly the result of extensive earlier development. Their makers had developed elaborate and precise foundry techniques for casting horns with thin walls, at about the same time when in Egypt instruments were produced from sheet copper, gold and silver, which could be worked to much finer gauges, making lighter instruments.

By the Late Bronze Age, we can detect two very different classes of brass instrument. One had a conical windway, typically terminating with a relatively small tube diameter of no more than 1.5 cm at its tip and opening out to 9-10 cm at the bell end. The other type of instrument had a large bore, of the order of 2-3 cm diameter.

From the beginning of the Iron Age (earliest evidence 700 BCE),

new technical capabilities become available. These focus principally on the use of pre-hammered sheet metal to create the fabricated objects, which at first largely replaced the earlier cast ones. This, however, required finding new ways to make airtight seams. The Etruscans used natural resins to seal a flanged seam which was held together with wire wrapped around the tube's periphery. Iron-Age peoples from temperate Europe varied this by riveting the two flanges together. Later a lapped over seam was covered with a sealing strip, soft-soldered over the joint. To join separate tubes together, the Etruscans inserted one tube end over the next and forced a cast ring over the two tubes to squeeze them together, filling the joint with soft solder. Others adopted the practice but created longer sleeves into which tube ends could slide. The soft solder in general use however possessed little strength compared to modern hard solders. It was the Romans who first hard-soldered the seams on the bells of their *cornua* in much the same way as a modern instrument maker might do.

Making in sheet and the newly-learned sheet-metal working capabilities led to the fantastic exuberance seen in the huge variety of Celtic horns (*carnyces*) spread all over pre-Roman Europe. With the new technical skills being passed from one community to another, each area was free to exploit its own characteristic designs which created a huge number of local instrument identities.

During this development, the conically-bored instruments appear to have undergone processes which either maintained or enhanced their conicity, thus enabling them to sound a range of notes pretty close to the partials of the natural harmonic series. The large-bored instruments, on the other hand, evolved in other ways while maintaining their large bores. This duality in form leads one to believe that the two different types of instrument were designed to be played in different ways, the conical ones as melodic horns, much in the way of modern western brass, and the large-bore instruments focussing on a single note as timbral instruments and varying the note's tone colour, as variable-tone-colour instruments,

i.e., in the manner of a modern didgeridoo or African horns until recent times. Experiments confirm that the large-bored *carnyx* reproductions respond well in this latter mode.

Some instruments are present in the archaeological record in only one form and some in both. The Irish horns, for example, are found only as large bore instruments, whereas the lurs are only found as conical instruments. The *carnyx*, *tuba*, and large curved horns are found in both varieties.

As music archaeologists have to rely on iconography and

relatively small three-dimensional representations such as statuettes and reliefs, it is not always possible to establish with confidence the way in which some instruments were being blown. Nonetheless, cross-comparisons over different cultures have contributed greatly to our understanding of musical cultures over wide geographical areas, enabling us to acknowledge better how both the design and application of brass instruments travelled widely throughout Europe in the Metal Ages, with both technical and organological features being widely shared.



Fig.1 Silver trumpet of Tutankhamen (1350 BCE). Replica: P. Holmes.

2.4 The Bronze Lurs. Magnificent Craftsmanship, Enigmatic Sound Instruments

Cajsa S. Lund

In 1797 a farmer on Zealand in Denmark found six curved metal horns in a peat bog called Brudevælde. They were found in several parts (Fig. 1). The horns turned out to be cast in bronze, made in pairs and were assumed to be very old. The Danish archaeologist C. J. Thomsen (who had proposed the Three-Age system – the Stone Age, Bronze Age and Iron Age) was the first person who was able to date these, along with a number of other bronze horns found in the early nineteenth century, to the period he called the Bronze Age. In 1836 he gave them a name: *lur*.

By the end of the nineteenth century, a total of twenty-five lurs had been found. Researchers were thus faced with a whole group of Prehistoric instruments which seemed to reveal an unexpectedly, highly-developed music culture of our early ancestors about three thousand years ago. These also seemed to reveal a high degree of skill in the art of casting bronze (Fig. 2). No wonder that the bronze lurs attracted attention not only in Scandinavia but also around the world. Among the great variety of archaeological finds they stand out in terms of both size and quantity. They were well preserved; some could still be played, and trombonists could demonstrate their excellent technical possibilities as performing instruments. In addition, images of bronze lurs, on rock carvings, which date from the Bronze Age, were also preserved (Figs. 3-4).

Today we know of no less than sixty bronze lurs, intact or fragmentary, which have been found chiefly in Denmark (37 lurs). Thirteen lurs were found in South Sweden (most of them in Scania), four in South Norway, five in North Germany and one in Latvia. Thus, the lurs are overwhelmingly a South-West Baltic phenomenon. It is an interesting fact that lur representations seem to be lacking on rock carvings in the central bronze-lur area, that is, in Denmark and Scania (as for Kivik – see fig. 4). They are found mainly in the Swedish and Norwegian provinces of Bohuslän and Östfold.

The predecessors of the bronze lurs were presumably ox horns.

In its highly developed form the bronze lur can be described as a ca. 1.60-2.40 m-long conical thin-walled (ca. 1.2-1.6 mm thick) resonating tube – curved in two planes – with a round ornate bell disc (between 13-29 cm in diameter, probably a sun symbol) and a pot-shaped or funnel-shaped non-detachable mouthpiece. On some of the lurs, a chain is attached for carrying and/or hanging and rattle plates can be seen near the mouthpiece and on the reverse side of the bell disc. An older type of bronze lur, more or less semicircular, is represented by a find made in a bog at Gullåkra in Scania, Sweden (Fig. 5). Such older lurs seem to be depicted on the rock carving at Kivik in Scania (Fig. 4).

The lurs are considered to be offerings, as they were evidently laid out in the ground, most often in bogs or other wet lands (perhaps also in lakes) as gifts to higher powers. Or were they maybe just thrown away to show how rich the owners were? Almost all the large curved lurs have been found in pairs and almost all the resonating tubes of a pair are symmetrically bent to mirror each other (Fig. 6). The identical size and pitch of the pairs of lurs is probably due to their being made in pairs for symbolic and/or magical reasons, and not to their being constructed expressly for two-part playing.

The bronze lurs are fabulous as handcrafted objects, cast by a technique known as *lost wax*. This technology is used even up to the present day in the production of complex objects with an internal cavity and very thin walls. However, it was practiced with great skill during the Bronze Age and, even up to the present day, no-one has succeeded in casting such large delicate objects as these successfully.

The resonating tube of a bronze lur had to be made of several smaller tube parts of different sizes, which were then put together. Simplifying things somewhat, the manufacturing process was like this: Firstly, the inner cavity of the tube part (the bronze lur's so-

called airway) was modelled in clay. When this had dried, a thin layer (ca. 1.5 mm) of beeswax was rolled out around the clay model and then itself covered with clay. When this outer layer of clay had dried, the mould was fired and the wax melted and flowed out through prepared holes or burnt off as it vaporised. Molten bronze was then poured into the thin cavity left behind by the burnt-out wax. When the bronze was solidified the outer clay layer was broken off and then the internal clay core removed as well.

A pair of bronze lurs that have some two meter long resonating tubes were made up of seven smaller tube parts. Thus, to make two such lurs, twice as many tube parts were needed, fourteen in all, and the duplicated pieces had to be almost identical. One must ask how often individual processes went wrong in the complex process of manufacturing a pair of functional bronze lurs. And one may wonder if there existed several workshops where bronze lurs were manufactured or was there maybe only one well-established factory, headed by a master and existing for generations as a solid family business?

Bronze is an alloy of copper and tin, certainly not a cheap “raw material”. Approximately three kilograms of bronze were needed for each lur. The value of a bronze lur must, like other handicrafts and precision work, mainly be measured in time of the production taken. The English bronze-lur specialist Peter Holmes has calculated that a group of bronze smiths could make only a few pair of lurs per year.

Who in the Bronze-Age society could afford a pair of bronze lurs? A high-ranked religious and/or political leader or a collective top

layer of the society? And who and/or what factors decided the design and the size of the lurs, and hence their properties as sound instruments? Was it the purchaser, the manufacturer, the performer (whoever it might be?) or all of them in collaboration?

On intact bronze lurs, modern trombonists can easily play about 8-12 natural notes, but this does not mean that Bronze-Age lur players either used or strove to attain this tonal range. It must be pointed out that it is with “music” as with speech: we are capable of producing an endless number of different sounds with our voice or with tools, but we only use a limited proportion of these. The choice depends on what we are striving for, which is, in turn, connected with *why* we are producing sounds.

Archaeological researchers agree that the bronze lurs were used in cult activities; rock-carvings show that they were played in pairs, indeed even in larger “ensembles” (Figs. 3-4). How the lurs really were treated technically and musically will doubtless remain a puzzle, as will the factors behind and the details of their evolutionary history. But the fully-developed Bronze-Age lur (the “classical” lur, like those on fig. 2 and fig. 6) may be a result not of refined musical requirements in our sense of the term, but rather of the South-Scandinavian bronze-workers’ habit of creating ever-larger and more-impressive prestige and cult objects.

Final remark. The bronze lurs were made and used around 1300-500 BCE, that is, within the Scandinavian Bronze Age. They have nothing to do with the Viking Age (ca. 790-1100 CE), an anachronism to be found in the literature up to the present day in non-specialist contexts.



Fig. 1 Illustration of the three pairs of bronze lurs as they were found at Brudevælde, Denmark. Drawing by Flemming Bau (1979).



Fig. 3 The most frequently reproduced rock-carving site with lur players is this one from the province of Bohuslän, Sweden.



Fig. 2 One of the bronze lurs found at Brudevælde, Denmark. Late Bronze Age. Copenhagen, National Museum of Denmark.



Fig. 4 Rock carving on stone No. 8 in the Kivik tomb, Scania, Sweden. Early Bronze Age. The figures at the top of the stone are supposed to be ritual “musicians” two of which, farthest to the right, play an early type of bronze lurs. Simrishamn, Österlens Museum.



Fig. 5 Early type of a bronze lur, found at Gullåkra in Scania, Sweden. Early Bronze Age. Lund, Historiska Museet.



Fig. 6 Bronze lurs found at Radbjerg, Denmark. Late Bronze Age. Copenhagen, National Museum of Denmark.

2.5 Introducing the Authority. *Cornua* and *litui* in Etruria

Marina Micozzi

One of the most peculiar aspects of the use of the music in Etruscan society is the particular relationship which existed between the *lituus* and *cornu* and the representation of political authority. These two instruments were not used by the Greeks. When ancient Greek sources talk about the kind of “*sálpinx*” invented by the Etruscans as a wind instrument which was useful in battle, we cannot know, however, whether this refers to the *lituus* or to the *cornu*, or perhaps both.

The link between these two instruments and the sphere of the authority was already well established in the second half of the fourth century BCE, when iconographic representations show men accompanied by processions (the *processus magistratualis*) in which the *cornu* and *lituus* players appear between figures who bring other objects known to be symbols of the rank of the magistrate himself (Fig. 1). From the same period, some actual instruments have been found in tombs of prominent persons. These are the first direct representations of political authority in the western Mediterranean before the rise of official Roman art.

And yet much of the meaning of this imagery eludes us. Although we can identify the external symbols of the authority of a magistrate, we are almost completely ignorant about the essence of his power, what duties he had and in what kind of building he carried out his functions.

Music is represented in more than half of the extant images, and other instruments may also be depicted. *Aulós* and *kithára* accompany the deceased in the *Tomba dei Demoni Azzurri* in Tarquinia and also appear later in certain images. Their association with the *cornu* is common on late Hellenistic cinerary urns of northern Etruria, where the *lituus*, in contrast, is never depicted. *Cornua* and *litui*, on the other hand, are the only instruments that appear, from the late fourth century onwards, exclusively in the context of the *processus magistratualis*, while there is no evidence

for them having enjoyed independent lives as musical instruments.

To understand why these instruments in particular were chosen to become signals of political authority, we must retrace their long histories back to the seventh century BCE. The earliest *lituus* was found in a votive deposit in Tarquinia (Fig. 2), together with a shield and an axe, perhaps also symbols of royal power. Before their ritual burial, all three objects were deliberately damaged, the *lituus* being bent into three pieces. Another *lituus* comes from the necropolis of Sodo near Cortona. This instrument was also ritually deposited, having been bent before its burial, dating at the end of the seventh century BCE. The provenances of all other known examples of *litui* are unknown. They have been in museum collections for long periods of time, and in some cases, even the original shapes of the instruments are uncertain.

Some images from the last decades of the sixth century to the mid-fifth century all represent the *lituus* in the sphere of athletic games. In the Tomb of the Monkey in Chiusi, for instance, a *lituus* player accompanies a chariot race. A similar theme appears on two *cippi* from Chiusi, on which a *lituus* player is depicted beside a small *aulós* player who is accompanying a boxing match. A chariot race is however depicted on the other side of each artefact.

This connection between *litui* and chariot races appears to be a leitmotiv in this period. On an Etruscan black-figure amphora, two *lituus* players are figuring in a three-horse-chariot race. It calls to mind the statement of Horace: “The *lituus* belongs to the cavalry and is curved, the *tuba* is used by the infantry and its shape is straight”. Did the close link between *lituus* and cavalry persist for a long period of time?

Evidence for the *cornu* also starts in the last decades of seventh century BCE. The earliest find comes from the Tomb of the Chariots in Populonia, in association with a *currus* – the male war chariot -, an axe and other objects which highlight the rank of the deceased.

Almost contemporaneous is the first iconographic representation: on the shoulder of an Etrusco-Corinthian wine jug, a horn player is involved in a scene of war probably related to the conquest of Troy. The horn player on a black-figure amphora from the late sixth century BCE is also shown in a military context, leading a group of warriors (Fig. 3). On a burial stele from Bologna (Fig. 4a-b) from the same period, a horn-playing warrior is engaged in a duel. Here, the horn is essentially used as a weapon – a use that is evident in other iconographic representations in the Etruscan Po Valley and Venetic regions. All of these horns are variants of the U-shaped type, reminiscent of the prototypes made from animal horns.

In Etruscan territory depictions of the *lituus* disappear at the middle of the fifth century BCE. They reappear in the fourth century BCE in representations of the *processus magistratualis*, but the images at this time now include the big circular instruments with supporting bars that came to be a feature of the Roman era.

Two primary conclusions can be drawn. First, the long histories of the two instruments were largely independent. The *lituus* and the *cornu* never appear together before the fourth century BCE. The second is the strong connection between the *cornu* and warfare. The *cornu* always appears in contexts in which the military aspect is dominant.

The only link between the *lituus* and warfare, on the other hand, is the presence of weapons in the Tarquinian votive pit. However, in this context the ritual component is absolutely dominant and even the weapons served as status symbols. The process by which weapons became status symbols rather than practical tools was a

phenomenon typical of the Etruscan Orientalizing period (seventh century BCE).

The most striking characteristic of the *lituus* is its association with the public sphere from its very first appearance. The *lituus* of Tarquinia was certainly buried in accordance with a precise ritual that implied the presence of many people, some of whom were active participants, and others, members of the audience. Sixth- and fifth-century documents also depict the *lituus* in the context of public events. These images depict a person with the authority to begin a public event for which a large audience is waiting in anticipation. In these examples the *lituus* player is not the person of authority himself, but the voice of the authority, just as the horn player who gives orders to warriors is the voice of their commander. The sound of the instrument is the signal of the authority's presence and authoritative role. The process of transformation from musical instrument to *insignia potestatis* is underway.

The historical backgrounds of the *lituus* and *cornu* may explain the choice of these instruments as *insignia potestatis* of Etruscan magistrates. However, we can only imagine the intermediate stages in their evolution, between the mid-fifth and mid-fourth centuries BCE. During this period, which was one of profound transformation in Etruria, there is a gap in the archaeological record. Afterward, in an Etruscan society dominated by a problematic relationship with Rome, symbols connected to the past – including musical instruments – were employed to establish and maintain political authority and power.

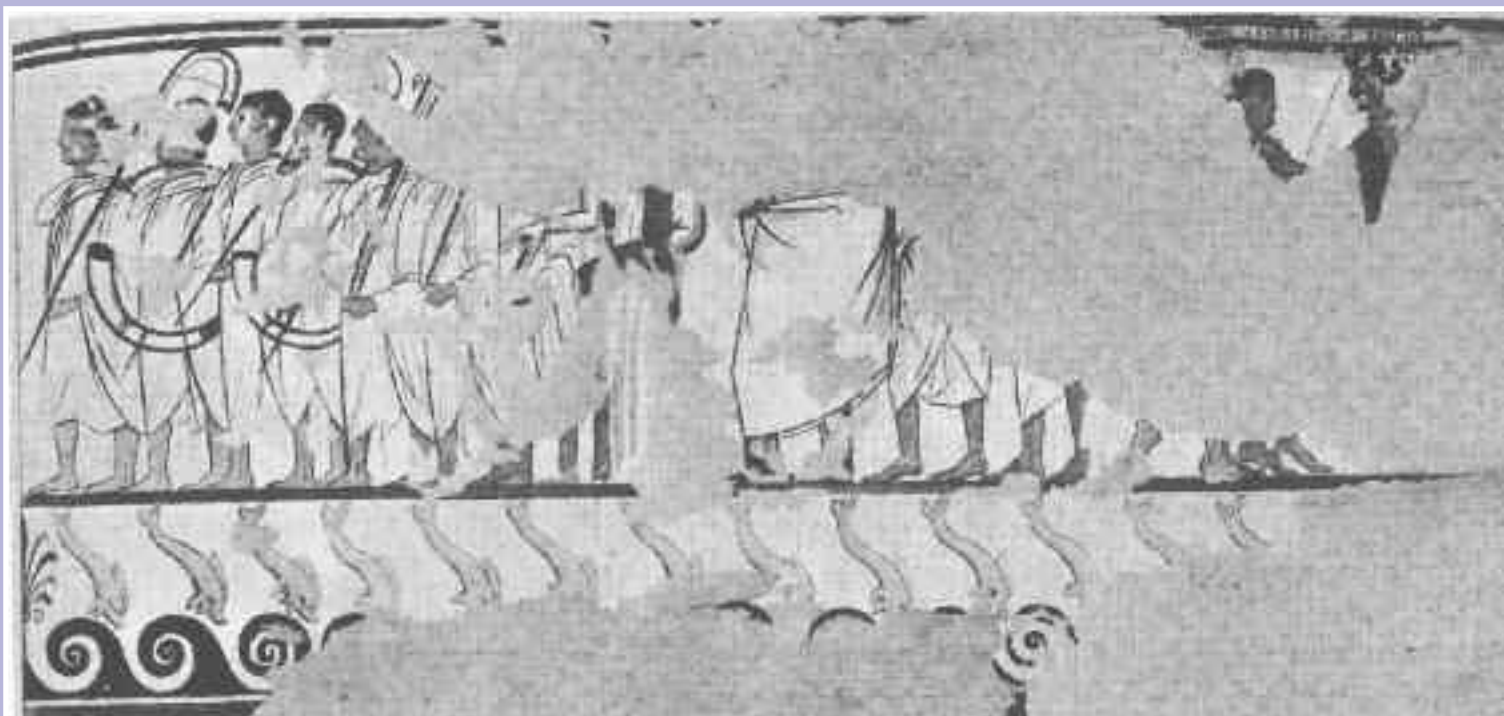


Fig.1 Tomba Bruschi.Tarquinia, Necropolis of Monterozzi.



Fig. 2 Etruscan Lituus from Pian di Civita. Tarquinia, National Archaeological Museum.



Fig.3 Etruscan black-figure Amphora by Micali Painter. Tarquinia, National Archeological Museum.



4a



4b

Fig. 4a-b Stele funeraria. Bologna, Archaeological Civic Museum.

2.6 The Phoenician and Punic Conch Trumpets. Ritual and Multi-task Purposes

Antonio M. Sáez Romero, José M. Gutiérrez López

Well-known in the archaeological record of the late Prehistoric Mediterranean, the seashells of the genus *Charonia*, which were worked in a variety of ways, are also closely linked to the Phoenician colonial diaspora at the beginning of the Iron Age (ninth century BCE) and the transfer of new technologies and forms of worship to the western areas of the Mediterranean. *Charonia* conches are still commonly found in sea beds at depths of five to ten metres (or even more), so specialized fishing skills and other techniques are required to capture them alive. Such skills included diving and the use of tools such as creels.

In western coastal areas, probably as part of a general Mediterranean trend, it seems very likely that *Charonia* conches were chiefly captured for their edible parts and also that their unused shells were collected along the sandy beaches of the region. In the same way, other types of shells were gathered and used for a specific purpose, which was the construction of floors of ritual spaces. In both cases, the shells would have served specialized functions without requiring any modification. On the other hand, there are *Charonia* shells in the archaeological record that show signs of having been modified. Among these, there is an increasing number which point to the regional manufacture of aerophones. These were created by means of cutting off the end of the apex and perforating the shells with holes to allow for the modulation of pitch and the attachment of cords, which were used for the transport and storage of the shells.

Most of the available contextualized evidence comes from Cadiz Bay (Spain) and the surrounding countryside. After the colonial stage, the Punic city of *Gadir* occupied huge areas of the present Bay of Cadiz from the sixth to the third centuries BCE. In this area, a remarkable set of findings points to a close connection between the conch aerophones and fishing and fish-salting activities. Three well-preserved Triton shell horns dating from the fourth to third centuries

BCE were found in the fish-processing site of Puerto-19. These were probably used by fishermen to signal between boats and by the guards of the watchtowers to indicate the arrival of tuna and to facilitate the installation of the large fishing nets called nowadays *almadrabas*. Other findings also suggest a possible link between the shells and ritual and funerary spheres. Two other complete specimens were excavated in a context which is linked to the discard of the debris from funerary feasts and rituals of the late Punic necropolis of *Gadir*. Furthermore, it is worth noting the presence of a growing number of conch aerophones in sites located in the southern part of the island of Cadiz (the so-called *Antipolis* of Strabo). At Camposoto, a pottery workshop, a very fragmentary and small specimen of *Charonia lampas* presenting the usual traces of human working was documented. Unfortunately, the specimen is of uncertain chronology. Some unpublished shell horns have been recently identified in the context of refuse at the pottery workshop of Torre Alta and are linked to discarded pottery as well as to organic materials associated with the consumption of food and the cooking practices developed by the workers of the workshop. Many fish bones and shells dating to the early second century BCE were found at the site. A later example comes from the site of Cerro de la Batería (another industrial location), where another conch aerophone was found inside a well, which had fallen into disuse perhaps during the early Augustan period or the first stages of the Imperial period. It is not possible to identify the functions of the conch trumpets in these pottery workshops, but it is easy to imagine that they may have been a multipurpose tool possibly linked to fishing, ranching, signalling and/or cult ceremonies.

In summary, the available archaeological evidence suggests that in the Orientalized areas of the central and western Mediterranean, even far beyond the Pillars of Heracles, during the first millennium BCE, the use of conch Triton trumpets was common both in worship and in various daily contexts, including industrial ones.

The multipurpose role of the shell horns seems to derive from an inherited multiplicity of roles in the Levant and the Canaanite cities before the Phoenician and Greek colonial diaspora was developed. However, the investigation of the functions of the shell horns in the Phoenician and Punic western Mediterranean is just beginning. The manner in which these instruments were played during the ritual ceremonies is as yet unknown and unfortunately, there are no literary sources to illuminate this issue with respect to the western communities.

Nevertheless, even if the finds suggest that the multiple roles of the aerophones may have been a widespread phenomenon, there is much archaeological evidence which points to an important

presence of the instruments in sailing and fishing activities. The use of the shell horns in these maritime contexts, such as the seasonal tuna watch, the signal to manoeuvre with fishing gear or the heavy *almadraba* nets, is in accordance with ethnographic evidence as the same conch aerophones have been used up until the 20th century CE for the same purposes. Undoubtedly, the artefacts cited in this work are only a few examples of a type of aerophone that may have been extremely common all along the western Mediterranean and its Atlantic extension, both in the coastal settlements and in the inland towns culturally and commercially connected with them.



Fig. 1 Map of the Strait of Gibraltar region with the main pre-Roman sites mentioned in the text (in the box, detail of Cadiz Bay).

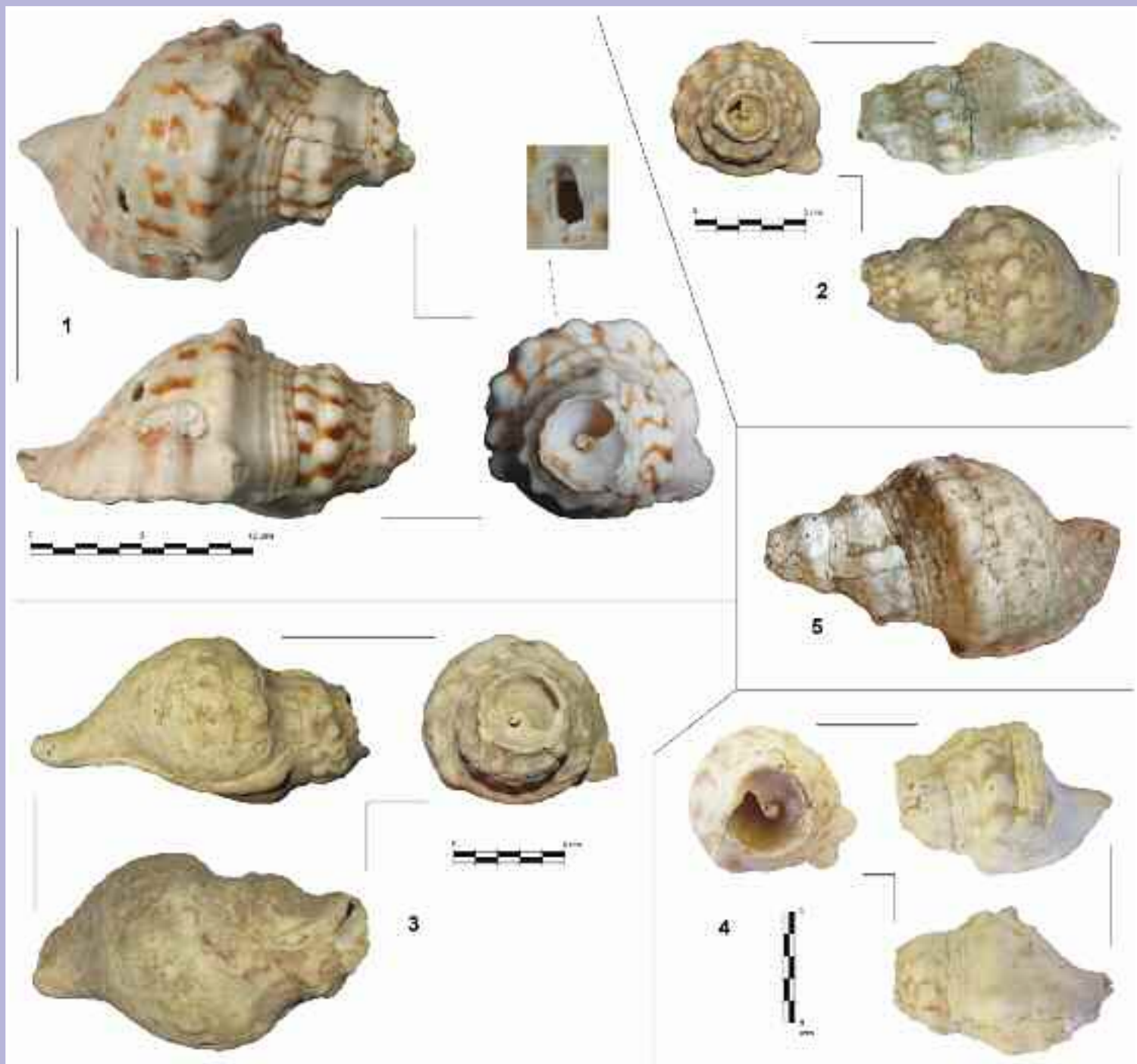


Fig. 2 Some of the conch aerophones found in the western Mediterranean contexts: Puerto-19 (1), Torre Alta (2-3), Cerro de la Batería (4) and Tamuda (5).

2.7 Controlling the War. Roman *cornua* and *tubae*

Chiara Bernardini

Brass instruments played an important role in Roman society and were considered to be very prestigious instruments by the Romans, who recognized their ancient origin in Etruria.

They are frequently employed in military contexts, used in battle and to accompany marching. Their ability to produce loud sounds made them useful in communicating and organizing on the battlefield, inciting the troops, intimidating the enemy, and even in relaying false messages to provide misinformation. Ennius comments upon the terrifying voice of the *tuba*, and the brass are described by Virgil as frightening, while Lucan tells of the ringing of the *litui* and the clang of the *tubae*, and Statius considers that the sounds of brass resemble human cries.

One late source says that the *tubae* gave the sign for the beginning of the battle and were used to announce the troops' departure from their camp, while the *cornu* was used to flank the standards when they were moved. Reportedly, *tuba* and *cornu* were blown together during the battle, but the *tuba* was preferred to announce the attack, stimulate the troops and frighten the enemy with its high-pitched sound. It also accompanied the march, as did the *cornu*, which was also sounded to mark the beginning of the battle and, with its hoarse voice, to incite the army to fight.

From the point of view of the iconographic sources, the use of brass instruments in fighting is largely documented by the "narrative" historical reliefs. On the frieze of Trajan on the Arc of Constantine players of *cornua* (the *cornicines*) and of the *tubae* (*tubicines*) are shown in the background of the battle, encouraging troops and scaring the enemy, with the victorious general in the centre of the dramatic battle, a composition that is seen on many sarcophagi of the upper classes (Fig. 1).

Indispensable in battle, brass players (*aeneatores*) were an integral part of the army. and many funerary inscriptions from the northern Empire proudly indicate that the deceased had served as a *cornicen* or *tubicen* in the Roman legions. The brass had a fixed role in military parades, being used near the standards and probably

acquired a similar significance to these, Cicero granting the brass the same value as weapons. Symbolizing as they did, the military prowess of generals, they led celebratory processions as in the triumph of Aemilius Paulus after the victory at Pydna in 168 BCE.

The iconographic sources confirm the trumpet's function of announcement in military and triumphal processions.

In this usage of the brass, the Romans were adopting a tradition established by the Etruscans. The earlier Etruscan composition of the magistrate's funerary procession, with the chariot of the dead preceded by trumpet players, is refashioned in depictions of the Roman triumphal parade, in which brass instruments, particularly the *tuba*, while celebrating the victorious general become instruments of political propaganda, particularly in the climate of strong competition during the late Republic.

Depictions of the procession, such as that from the Temple of Apollo Sosianus (Fig. 2) in Rome from the late first century BCE are full of symbols emphasizing the Emperor's personal charisma and power. Among these symbols is the *tuba*, which was an element of Augustus' restoration of ancient Rome. In the procession, the trophy was followed by the long *tuba*, which in turn headed the attendants who lead three bulls to sacrifice, marking the *devotion* of the Emperor and the official character of the event.

The social position of brass players, the *aeneatores*, is attested by their organization in professional associations, the *collegia*, which were so prestigious in Rome. The *collegium* of *aenatores tubicines liticines* and *cornicines* was allowed to dedicate honorary monuments to the Emperors of the Julio-Claudian family in the ancient and sacred area of the *curiae veteres* in the heart of Rome. This license demonstrates the close relationship which existed between the *aeneatores* and the central government. Brass instruments were not only instruments of war, functioning as they did as instruments of public utility in the life of the city in periods of peace. Their primary war-time functions of announcing and highlighting authority on public

occasions were preserved in their use in processions as well as in the games.

In conclusion, the Roman brass were important military instruments, as evidenced in the *tubilustrium*, the festival dedicated to Mars which celebrated the beginning of the war season with purifications of the *tubae sacrorum*. Brass instruments had acquired meaning as a symbol of the military and religious power of the

leader from the very beginning of their use by the Etruscans, but the symbolic associations of the instruments became more elaborate in the visual language of Rome. Here, the brass, in particular the *tuba*, became political instruments to indicate the authority of the leader – general, magistrate or Emperor – in all public processions, assuming an evident official and codified meaning in the High Empire.



Fig. 1 The Ludovisi Battle or “Great” Ludovisi sarcophagus. Rome, Roman National Museum (Altemps Palace).



Fig. 2 Apollo Sosiano’s frieze. Rome, Capitoline Museums (Centrale Montemartini).

2.8 The *carnyx*. The Animal-Headed Horn of the Iron Age

Fraser Hunter

The *carnyx* is one of the most striking musical instruments from European Prehistory. It is a distinctive animal-headed horn whose origins lie in the Celtic world, but its use spread widely across later Iron Age Europe and beyond. It was a very dramatic instrument, with a long, straight, very slightly conical tube, which curved at the end into an animal head; overall it was about the height of a person. Since it was played upright, it had a tremendous visual impact, and the sound projected far and wide. It was used in warfare, to inspire and terrify, but also had ceremonial uses. The name probably comes from the Celtic word for horn; it is preserved in some late Greek texts, long after the instrument fell from use. Our evidence for it comes from fragments of the actual instruments and depictions by societies who used them and, more commonly, by the societies of the classical world that fought against them.

The evidence of surviving instruments has expanded greatly in recent years (Fig. 1). In 1959 Stuart Piggott could list only three examples, from Deskford and Tattershall Ferry in Britain and Kappel in Germany. A few more were subsequently recognised, but the picture was revolutionised by the 2004 discovery of a hoard in a Gaulish temple at Tintignac in Limousin, France. This produced pieces of seven different *carnyces* and revealed all the different components of a *carnyx* for the first time (Fig. 2). Suddenly, puzzling fragments from across Europe could be identified as pieces of *carnyx*, and we now have at least ten findspots with pieces of at least twenty *carnyces*. This is still a small total for such a widespread and long-lived instrument, but it is a much better basis for study. More fragments must still lurk unrecognised in museum stores.

The most common animal represented is a boar, though the Tintignac find included a snake head, and depictions suggest there were also horses, wolves and perhaps birds. Recent finds show that there were many different ways of making a *carnyx*, with three

different technologies in the Tintignac hoard alone: soldered sheet bronze, riveted sheet bronze, and cast bronze. There were also considerable differences in styles of decoration and in technical details. A lot of these are variations on a common theme, but there were also quite different styles such as the rather complicated head from Deskford (UK) and what is probably a silver example from Sălișteea in Romania. This variety is unsurprising over such a long lifespan; *carnyces* were used for at least 600 years, with the earliest evidence so far coming from coins commemorating the Celtic attack on Delphi (Greece) in 279 BCE and the latest from a Roman triumphal arch of ca. 300 CE.

Our knowledge of *carnyces* is expanded by iconographic evidence. Iron Age coins from France and southern Britain show the *carnyx* in various contexts – brandished by warriors, horse-riding women and gods. A statuette of a *carnyx* player from Kondoros in Hungary and a small amulet from Bouy in France show all or part of the instrument, but the best depiction is on the silver cauldron from Gundestrup in Denmark, which shows three *carnyx* players in a procession (Fig. 3).

Much of the evidence for the instrument's distribution comes from the classical world. The Greeks, and later the Romans, came across the *carnyx*, and were very impressed by it. The Greeks saw it in the hands of Celtic raiders and mercenaries, while the Romans encountered it as they conquered large parts of Europe. As they celebrated their victories over various barbarian tribes, they often depicted the vanquished people and their weapons on coins and in sculpture. Their depictions focussed on distinctive non-Roman items such as the *carnyx*, which seemed very strange to classical eyes. Such evidence shows some of the groups who were using the *carnyx* at different times, but is biased because it reflects the limits of Roman knowledge – they only depicted tribes they were fighting against. However, it demonstrates that use of the instrument spread

beyond the Celtic world to Germanic and Dacian groups. Other evidence confirms there was much cultural interchange between different groups in Iron Age Europe, and it is no surprise that such a striking instrument should have been widely adopted. Indeed, musicians are often quite mobile individuals, taking their skills to different communities and different patrons, so the spread of *carnyces* also suggests the movement of musicians and their knowledge. A depiction of *carnyx* players from Sanchi in India shows just how far such musical connections could stretch.

The *carnyx* was not just an instrument of war. It is often shown in the hands of warriors on Celtic coins or in piles of defeated weaponry on Roman coins (Fig. 4), but it had other uses too. A couple of Celtic coins depict it in apparently ceremonial roles, while some Roman sculpture from southern France shows that in this area it survived the conquest of Gaul and continued to play a role in religious ceremonies.

The question of its origins is not clear, but it was probably developed as a result of contacts between the Etruscans (who had a strong tradition of sheet bronze musical instruments) and the Celts in the fourth century BCE. We do not have enough evidence to

discuss its detailed development, but surviving fragments reveal quite a lot of variation between different instruments. This has been confirmed by modern reconstructions; the *carnyx* reconstructions from Deskford and Tintignac have very different musical properties. Both also show the considerable musical potential of the instrument, with a wide and versatile range. Questions remain over how the instrument was used. The Gundestrup cauldron shows it played vertically, but surviving instruments have a straight tube leading directly into the mouthpiece. This would be very hard to play vertically as the posture would greatly restrict the player's lungs. It is likely that there were different solutions, with some instruments being held at an angle, or with different mouthpieces, such as angled or curved ones.

In conclusion, the *carnyx* is a dramatic and spectacular instrument that reveals the distinctive musical traditions that developed north of the classical world. Reconstructions show that it was a complex instrument, while archaeological evidence demonstrates it was long-lived and popular, starting in the Celtic world but spreading beyond this over a period of some 600 years of use.

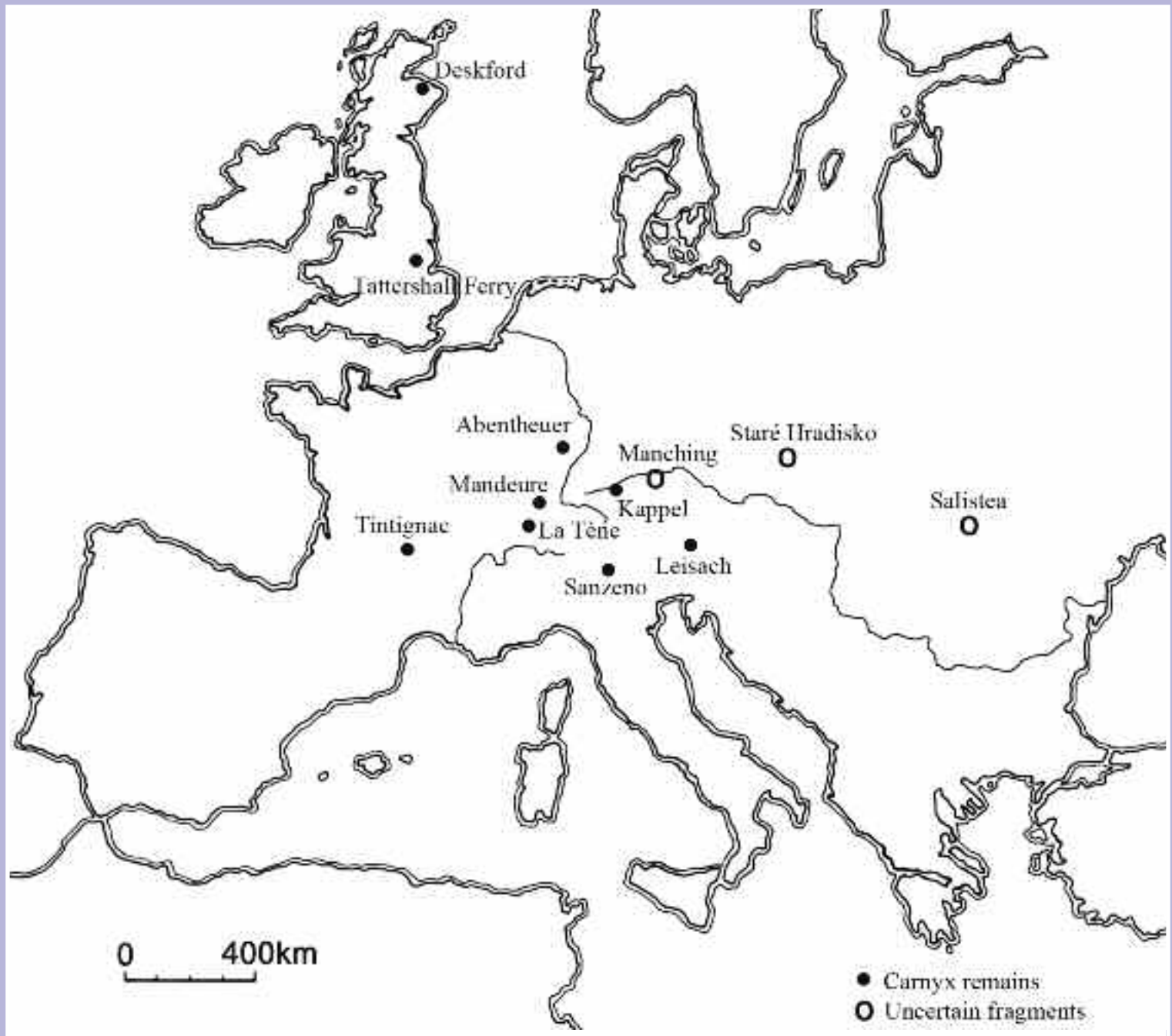


Fig. 1 Map of *carnyx* findings.



Fig. 3 Gundestrup cauldron panel. Copenhagen, National Museum of Denmark.



Fig. 2 Reproduction of Tintignac *carnyx* made for Archaeomusica Exhibition by Jean Boisserie.



Fig. 4 Roman republican coins. Edinburgh, National Museum of Scotland.

2.9 Carnyx Meets Clay. Pottery Trumpets of the Iberian Peninsula

Raquel Jiménez Pasalodos

The Celtiberian circular, clay trumpets (Fig. 1) are one of the largest collections of musical instruments from European antiquity and are the earliest known examples of circular brass instruments. This collection of artefacts, some seventy in number, includes fragmentary examples ranging from mouthpieces, bells and tubes to nearly complete instruments. All in all, they may well represent a minimum of 43 complete trumpets. The majority of the artefacts were found in the Arevacan city of Numantia, a Celtiberian fortified town in the northern half of the Iberian Peninsula. Numantia was known for its resistance against Roman rule for a period of twenty years and for holding out against a Roman siege for thirteen months. The city thus attained mythological status in the works of Roman writers and in Spanish literature. The reputation of the city of Numantia led to its early discovery and excavation in the first decades of the last century, during which period these musical instruments were unearthed. Unfortunately, their precise archaeological contexts are not known, as a result of the excavation techniques employed in the early 20th century. The instruments themselves, however, can be cross-referenced with iconographic and written sources to determine their function. Comparison can also be made with other wind instruments, such as the *carnyx*, to enable us to make deductions about the use, function and significance of clay trumpets within Arevaci society.

The clay trumpets are technologically highly sophisticated and incorporate various designs of mouthpiece, some being very similar to those of modern brass instruments. The decoration on the bodies of the instruments suggests that their function was not only acoustic and that the instruments held some form of symbolic meaning. Some examples of the trumpets are adorned with geometric painted patterns and animal clay figures, one of which is a horse's head located at the junction between the tube and bell of the instrument. Another important decorative element is displayed on at least two

trumpets; on these instruments the bell, made from clay, is in the form of a wolf's head with open jaws (Fig. 2). Horses and wolves held symbolic meanings in the Celtiberian world, and images of these animals are frequently depicted on pottery vases and on metallic objects from this culture. Observations relating to these symbolic decorations and other technical details are key to understanding the clay trumpets as possible Celtiberian versions of the *carnyx*. The Celtiberians can be considered to be some of the best pottery-makers in the Celtic world, largely due to their close links to and contact with Mediterranean Iberian cultures. Therefore, they probably created their own clay version of the metallic *carnyx*. With this in mind, we might speculate that these instruments were analogues of the *carnyx*, being involved in Celtiberian rituals in the same way that other Celtic societies utilised their metal *carnyces*.

The Celtiberian instruments, however, probably had a variety of uses and functions, not being restricted only to use in ritual contexts. Roman literary sources refer to the existence of trumpets used by communities of northern Iberia. Strabo describes the use of a particular type of trumpet which was ordinarily played with the doublepipes to accompany dances. However, the most interesting reference to the use of trumpets among the Celtiberians appears in Appiano's work on Iberia. It is written in Greek a century after the Roman conquest of Numantia and contains a detailed history of the Celtiberian wars. In one passage, Appiano highlights a decision made by the Numantine warriors not to sound their trumpets as they left the city in anticipation of carrying out a surprise attack on a Roman detachment which was blocking a river crossing, a vital supply route for provisions to the city of Numantia. Iconography also demonstrates the trumpets' association with warfare. An example of a Roman "trophy" frieze found in the city of Clunia (Fig. 3), one of the most important Roman foundation cities of northern Hispania, located close to a previous Arevacan city, displays two circular

trumpets amongst other spoils of war captured from a Celtiberian community. In other parts of Europe and Spain, the *carnyx* typically appears on Roman depictions of victory over other Celtic tribes, as an identifying symbol of the subjugated Celtic warriors. But in the case of Clunia, the depictions include circular trumpets, rather than the *carnyx*, along with swords, shields and other elements of war that are symbolic of conquest. The images are not exact replicas of the shapes of the circular clay artefacts and therefore cannot be said for certain to be representations of our archaeological specimens. Nonetheless, these depictions could represent the Roman interpretation of Celtiberian instruments belonging to the Celtiberian warriors.

Apart from this interpretation, which is based cultural comparisons, written and iconographic sources, an optimum way to understand these instruments fully is to produce accurate replicas. The reproduction of such instruments provides considerable information, not only regarding their musical capabilities but also their value to society. In replicating the instruments, we have, as much as possible, utilised the processes employed by Iron-Age artisans, from the collection of materials through to the firing of the replicas (Figs. 4 to 9). The clay trumpets were produced in three main parts: a mouthpiece, a cylindrical tube and the bell which serves as a sound amplifier. They had three different varieties of mouthpieces, and these were replicated from the original archaeological specimens.

The three pieces of the instrument were made on a potter's wheel and are assembled together, once these pieces have dried sufficiently to be manipulated without risk of breaking. At this point, decorative elements can be added (such as the horse's head figure) and some of the bells can be shaped as wolf heads. The replicas are then dried slowly; at this point they are extremely delicate, and if any breakages occur, they would not be functional. At this stage, we found that frequent repair work on the tubes was required. Whilst the clay was still malleable, we used a knife to burnish the surfaces

of the replicas in a manner faithful to the original archaeological specimens. After a few more days of drying, we proceeded to paint the replicas using the same pigments and decorative patterns, which were used to paint the originals.

Once dried and decorated, the replicas were ready to be fired. Modern potters use gas, oil-fired or electric kilns, which maintain a constant and even temperature throughout the firing period; however, until recently, only wood-fired kilns were used. As our goal was to replicate to the best of our knowledge the original techniques, it was decided that a copy of a Second Iron Age kiln should be built (Fig. 10). The kiln was heated with wood, and the replica clay trumpets were fired to a temperature of 800°-900° C. This temperature is similar to that achieved by the Celtiberian artisans. The whole firing process can last six to seven hours, but the kiln must be closed for two days until the temperature is low enough to avoid thermal shock upon opening as this could break the pieces. The whole process of making these instruments is time-consuming and requires a high degree of skill and patience as well as much care in the production and decoration of the instruments. This is an indication of the high value of the clay trumpets to Celtiberian society. The manufacturing process resulted in functional natural trumpets with different acoustic characteristics depending on their sizes and mouthpieces.

One of the key elements to achieve good result was the help and advice of traditional pottery artisans, whose skills have been handed down through generations. Their expertise has allowed us to fairly accurately understand the way the clay trumpets were produced. If it were not for their guidance, the authentic replication of the production process of the instruments and the construction of the wood-fired kiln would have been impossible. The knowledge and skills provided by the many craftspeople of the older generation are key to answering archaeological questions. With the loss of their knowledge, we also lose the possibility of interpreting our history.



Fig. 1 Complete decorated example (Numantia). Second century BCE. Soria, Numantín Museum.



Fig. 2 Zoomorphic bell (Tiermes). 2nd century BC.. Madrid, Museo Arqueológico Nacional.



Fig. 3 Roman Trophy of Clunia. Burgos, Museo Provincial de Burgos.



Fig. 4 Reproduction of trumpets for Archaeomusica Exhibition by Antonio Padilla Herrera and Raquel Jiménez.



Fig. 5 Preparing the clay.
a. Decantation process.
b. Decanted clay.
c. Kneading the clay.



Fig. 6 Drawing of mouthpiece and tube fragment. Soria, Museo Numantino.

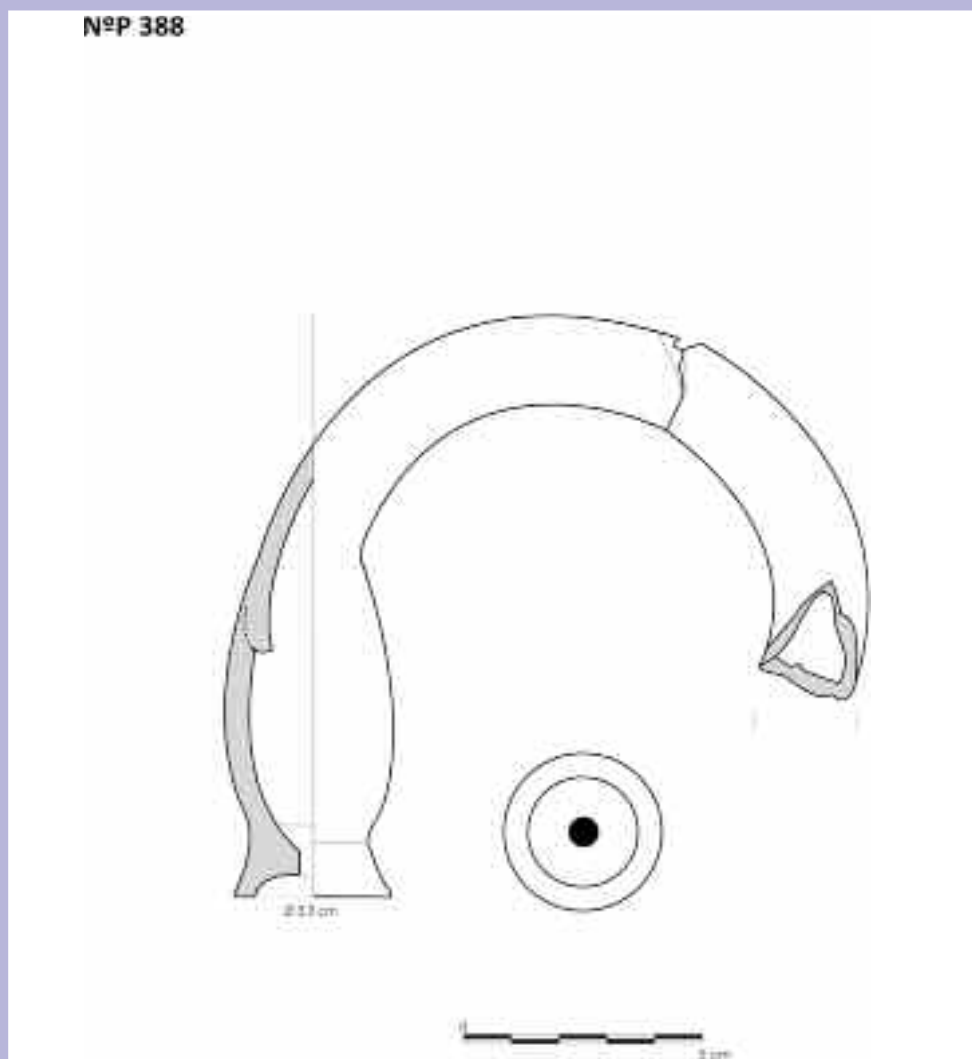




Fig. 7 Making the bells.



Fig. 8 Assembling the trumpets.



Fig. 9 Making zoomorphic bells.



Fig. 10 Firing.

2.10 Breathing Harmony. The Art of the Ancient Doublepipe

Olga Sutkowska

Reed doublepipes, called *auloi* in Greek and *tibiae* in Latin, are the musical instruments which appear most frequently in iconographic and literary sources of the Graeco-Roman culture. A large number of archaeological finds from three different continents (Europe, Asia, and Africa) also confirm the popularity of this instrument type between the eighth century BCE and the end of the Roman imperial period. The doublepipe, however, looks back to a much longer history. Its earliest known European representation is found in a marble statue from the Cycladic Islands, dated to the third millennium BCE (Fig. 1). Roughly contemporary are the silver pipes from Ur in Mesopotamia, a pair of thin tubes found bent and broken in the royal cemetery, these being plausibly interpreted as the remnants of a reed doublepipe.

The characteristic posture of a musician playing two pipes at once in a reversed V-shape appears in countless depictions from the Near East, the whole Mediterranean and vast areas of the former Roman Empire. In the wake of the conquests of Alexander the Great Greek-type *auloi* migrated as far as modern Tadjikistan, with images found even in Central India. Instruments dated to the Roman imperial era were discovered in such remote places as London and the ancient Kushite capital of Meroë in modern Sudan.

The design of reed doublepipes changed over the centuries, with different types being used contemporaneously. Some constructional characteristics, however, remained constant. These are the presence of a reed in each of the pipes – the available evidence showing that these were double reeds, like in a modern oboe, a bassoon, or a duduk – and the cylindrical bore of each pipe. The same features together with the doubleness of the instrument determine its acoustic and tonal possibilities. Two pipes sounded at once provided many opportunities for both harmonic as well as melodic musical creations; they could have been played in harmonious intervals, split into a bourdon and a melody pipe, or

connect into a strong unison, which by only slight frequency difference between two pipes could easily transfer into a stimulating, beating sound. The use of a reed has a crucial influence on the timbre, which differs so greatly from that of a flute or brass instrument. Last but not least, the type of the bore in a wind instrument (cylindrical or conical) determines its pitch and tone quality; pipes with a cylindrical bore playing an octave lower, but producing an octave and a fifth by overblowing, and a sound spectrum in which the odd harmonics stand out. Among the modern musical instruments there is no counterpart of a cylindrical doublepipe with double reeds. Most of the ancient doublepipe tradition disappeared with the end of Antiquity.

By that time the doublepipe had become a sophisticated instrument. Its technological advancement was associated with an increasing number of tone holes. The silver pipes from Ur were likely equipped with three and four finger holes respectively. The surviving Greek pairs from the fifth century BCE all had six finger holes in each pipe. The so-called Berlin and Louvre *auloi* of uncertain date, both made of wood, had pipes with respectively 7 / 8, and 7 / 9 finger holes (Fig. 2). The highest documented number of finger holes belongs to the Roman imperial set of four exceptionally well preserved pipes from Pompeii (Fig. 3). These are provided with respectively 10, 11, 14 and 19 tone holes. Pipe lengths also varied considerably.

When the number of finger holes exceeded that of the player's fingers, and when some holes on long pipes were located out of the hand's reach, some mechanical systems were required for closing and opening the tone holes. Ancient tradition ascribed an important invention to Pronomus of Thebes, a Greek *aulos* virtuoso from the fifth century BCE, making him the first to have played all three established modes on one and the same instrument. Before then, a separate *aulos* had been required for each.

A study of archaeological finds reveals two different types of mechanism, both of highly complex construction: one of 'sliders', and another of so-called 'rotating sleeves'. The sliders, first known from the late fourth century BCE, were basically plates that would cover a hole and were mounted on long rods which shifted longitudinally, thus operating bass note holes from a distance. The latest evidence comes from the Meroë find, which forms one of the most outstanding sets of reed doublepipes ever found. These heavily fragmented instruments come from the tomb of Queen Amanishakheto, who ruled in the last decade of the first century BCE. The Meroë sliders were highly ornate, the cover plate having been formed as a shell, held in the snout of a miniature dolphin.

The same instruments also featured sections with rotating sleeves, of very similar structure to those identified on the Pompeii pipes and on so far known 19 other finds unearthed in Italy, Greece, Slovenia, Hungary, United Kingdom, Turkey, Egypt, and Syria and all dated to the Roman imperial period. What distinguishes these instruments from the simpler models is a very particular internal structure of the pipes, forming a pinnacle of ancient craftsmanship.

A hallmark of the highest technical level is also the outstanding ornamentation which has been recognized on some of the preserved archaeological finds. The Poetovio fragments are perhaps the most spectacular example (Fig. 4). Dated to the second or third century CE, these were unearthed in 1988 in Ptuj in Slovenia, the ancient Roman city of Poetovio. Some of their tone holes are equipped with additional side-tubes, whose function is still not fully understood. There is no doubt that the Poetovio *tibia* and similar doublepipe finds with mechanisms must have been expensive professional instruments for virtuoso performers and are a testimony of a very sophisticated musical culture in the Roman

imperial period, which follows the highest Hellenistic standards.

In Greece, professional *aulós* players existed from Archaic times on. The great virtuosi enjoyed social privileges and wealth as well as fame, their names being known even today. Their successes were dearly bought by a hard and expensive training as well as constant competitive pressure. An Attic vase painting from around 480 BCE shows a professional *aulós* player in performance, dressed in special attire (Fig. 5). The strap around his head, called *phorbeíá* in Greek and *capistrum* in Latin, supports the lips of the musician. The most prestigious musical competition was the Pythian festival in Delphi, where a regular part of the *aulós* contest consisted of playing the so-called Pythian *nómos*, a musical composition of fixed structure, narrating Apollo's fight with the giant serpent. One of its parts depicted the dying dragon in the highest register.

Doublepipes were also crucial for the performance of rituals, both in civic cults and more ecstatic forms like the worship of Dionysus (Fig. 6) and various forms of the Great Mother. In the latter they were often used in combination with percussion instruments such as the frame drum (*týmpanon*) or cymbals (*kýmbala*). During sacrificial acts, the instrument was also utilised to conceal any noise emanating from the animal victim.

Apart from these and other public occasions, including processions, weddings, funerals and theatrical performances, the doublepipes were also ubiquitous in many more private activities such as work, sport, upper-class drinking parties and domestic entertainment. Literary sources give us an idea of the instruments' enormous range of expression, connecting to and evoking all kinds of emotions, and in this way being capable of performing the cathartic function that was exploited in ancient ritual and, sometimes, even medicine.

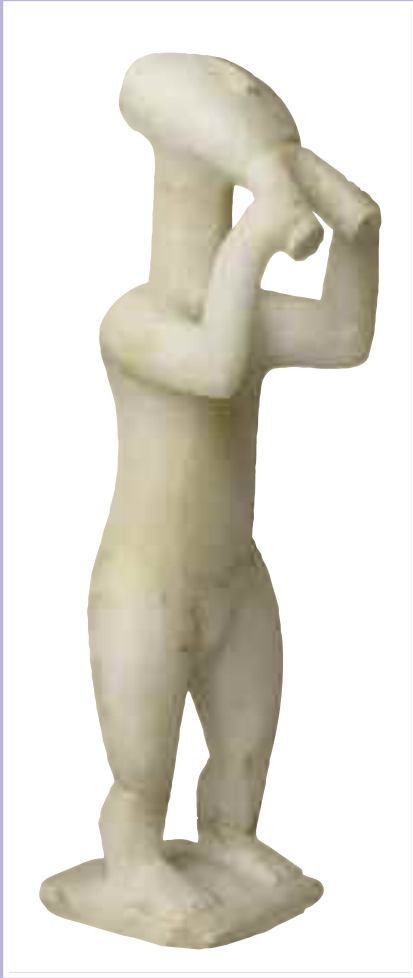


Fig. 1 Male Cycladic idol from Keros, Greece (middle of the third millennium BCE). Athens, National Archaeological Museum.



Fig. 2 The Louvre *aulos* found in Egypt (300 BCE – CE 300). Paris, Louvre Museum.



Fig. 3 One of the pipes from Pompeii, Italy (first century CE). Naples National Archaeological Museum.



Fig. 4 Fragment of a *tibia* from Poetovio/Ptuj, Slovenia (second or third century CE). Ptuj, Ptuj-Ormož Regional Museum.



Fig. 5 *Aulos* player with a *phorbeia* on an Attic red-figure vase painting from Vulci, Italy (ca. 480 BCE). London, British Museum.



Fig. 6 Detail of the Dionysus mosaic from Cologne, Germany (ca. 230 CE). Cologne, Romano-Germanic Museum.

2.11 Doublepipes from Pompeii

Stefan Hagel

This book provides many examples of musical instruments that showcase, more than most other material relics, the technical proficiency of the civilisations that produced them. This is even true for Graeco-Roman culture, as was realised in the late 19th century when scholars took a closer look at a number of pipes that had been found in the ruins of Pompeii. These artefacts were evidently examples of the famous ancient doublepipe, known as the *aulós* in Greek and the *tibia* in Latin. Well-known instruments due to both iconographical representations and descriptions in literature, they consist of two pipes with different finger hole positions equipped with oboe-like reeds. The two pipes were played simultaneously, producing music from a variety of consonant and dissonant intervals.

Although more doublepipes had been found at Pompeii, scholarly attention became focused on a particular set of four pipes, perhaps because these stood apart visually. While the surfaces of all others consisted only of bronze, which by the time of discovery had become considerably corroded, the surfaces of these four instruments consisted of alternating sections of bronze and silver. This suggested a comparatively expensive cost of production as well as a particularly spectacular appearance of the pipes in their original polished state.

The pipes were not made entirely of metal, even though it might have been easier to produce them in such a way. However, as each pipe was simultaneously held and played with a single hand, the weight of the pipes was a crucial factor. Therefore, the bulk of the interior was made of lighter bone or ivory (the shiny surface of which was allowed to appear only on the decorative bulbs close to the upper ends). In contrast, the metal layer was only about a millimetre

thick. Closer inspection revealed that it actually consisted of two thinner layers, one firmly glued to the bone core, the other freely revolving in sections of a few centimetres in length. Each section contained one or two finger holes. The purpose of this sophisticated construction is clear enough. With the help of small, beautifully crafted knobs attached to the outer rotating sleeves, the player was able to close and open individual finger holes at will, changing the key or the playing range.

A pipe sounds only if it is airtight; otherwise it will either squeak or remain mute. Astoundingly, the ancient instrument makers proved able to provide airtight metal sleeves which still rotated easily. This required seamless tubes, much more difficult to produce than tubes rolled from sheet metal, as was done for many trumpets and horns. *Aulós* tubes needed to be cast and subsequently turned on the lathe, inside and outside, with only a few micrometres margin for a perfect fit. Equally amazing is a clever tuning mechanism at the upper ends of the tubes, which involved metal-coating a ring of bone less than a millimetre thick.

The music produced from such instruments was obviously worth the substantial technical effort. Expensive though they must have been, instruments of similar make were distributed across and beyond the Roman Empire. We know this not only from numerous depictions, but also from excavated fragments found in as remote places as the British Islands and a royal tomb of the African kingdom of Meroë (now Sudan).

The European Music Archaeology Project has for the first time undertaken a functional reconstruction of the best-studied pair of Pompeian *auloi*, bringing to life harmonies that had been buried almost two millennia ago.



Fig 1 Roman doublepipe (tibia) from Pompeii (Italy). Replica (bronze, silver, artificial ivory, cane) by P. Holmes, S. Hagel, M. Sims, N. Melton, O. Sutkowska.



Fig. 2 Roman doublepipe (tibia), detail, from Pompeii (Italy). Replica (bronze, silver, artificial ivory, cane) by P. Holmes, S. Hagel, M. Sims, N. Melton, O. Sutkowska.

2.12 Mediterranean Routes of the Frame Drum

Emiliano Li Castro

The elusive nature of the frame drum – an instrument made of perishable materials such as wood and skin – and the consequent lack of actual finds calls for a survey to be carried out which is based only on the iconographic evidence, cross-checking it with the few literary sources which are available. This is a rather complex task because this instrument has travelled extensively, at least as much as those divinities who were specifically linked with it.

The first evidence indicating the presence of the frame drum can be found at the end of the third millennium BCE in Near-Eastern civilizations, close to the eastern coast of the Mediterranean Sea, in sites such as Tello and Ur. The instrument is clearly widespread in all the eastern regions of the Mediterranean area by the dawn of the first millennium BCE: in Syria/Israel/Palestine, including the Phoenician territory, in Egypt, in Cyprus and beyond. Much later Greek texts indicate that the frame drum was tightly linked with ecstatic cults like those of Cybele and Dionysus, in a relationship that could even have its origins in the second half of the second millennium BCE.

Crete certainly plays a part in this picture. Even the difficult birth of the Cretan-born Zeus has echoes of the beat of drums. On an outstanding bronze artefact from Crete – a votive offering shaped in the form of a frame drum – the central figure has been identified as Zeus (Fig. 1). He is flanked by two winged daemons who are beating four drums, with a direct allusion to the *Kouretes*, the daemons who beat their shields like drums in order to drown out the cries of the infant Zeus, so preventing his father *Kronos* from finding and devouring him just as he did with his elder siblings. The astounding object, dated to the end of the eighth century BCE, comes directly from the Idaean Cave, the Cretan birthplace of the king of gods. According to Euripides' *Bacchae*, the frame drum was given to Cybele and Dionysus by the Phrygian *Korybantes*. These were the worshippers of the Great Mother of Gods, but have often been assimilated to or confused with the Cretan *Kouretes*, obviously because both were envisaged as being engaged in very similar

activities. On the other hand, Dionysus is already mentioned together with his father Zeus in a Mycenaean text found in Crete, and he retained a Cretan association in later myth, where he marries the princess Ariadne, daughter of Minos.

Plentiful iconographic evidence for the frame drum – particularly clay statuettes and steles – spread westward from the Near East along the route taken by the carriers of Punic civilization, arriving at the two main Italian islands, Sicily and Sardinia, the Balearic Islands and the Iberian Peninsula not later than the sixth century BCE (Fig. 2). In contrast, Greek iconography represents frame drums only from the middle of the fifth century BCE onwards.

Greek influence was especially strong in Sicily and the whole south of Italy – the region called *Magna Graecia*. In fact, during the fourth and third centuries BCE, images of frame drums are remarkably abundant in this wide area, including an impressive number of vases produced by local workshops, along with many clay figurines (Fig. 3). Several of these statuettes are related to the cult of Demeter, one of the many manifestations of the Mother Goddess.

The *Bacchae*, a tragedy by Euripides first staged at the end of the fifth century BCE, mention the frame drum frequently, giving this instrument an outstanding prominence, discussing its origin, its long tradition and wide diffusion no less as well as the cult of Dionysus and its link with Cybele. The plot focuses on King Pentheus' resistance to the new cult of Dionysus, which he regards as dangerous for the ordered life of the community.

A similar conflict is reported by Livy, in his history of Rome. Here the Roman consul *Postumius Albinus* promulgates a merciless verdict, the famous *Senatus Consultum de Bacchanalibus*, in 186 BCE. However, compared with the Greek tragedy the historical event takes the opposite route. While there, as a result of Dionysus' revenge, Pentheus is torn to pieces by the Maenads and by his mother Agave, *Postumius Albinus* fiercely persecutes thousands of worshippers even before the Republic can suffer any real danger.

Apparently, these efforts of a single magistrate put an end to the crowded Bacchanals illustrated by Livy.

The hard measures imposed by the Romans on the Campanians as a result of the Second Punic War, the struggle of the Roman women to recover some of their rights, which had been suppressed in the same wartime circumstances, and the arrival of the cult of Cybele in Rome, with the official dedication of a temple in 191 BCE, just five years before the *Senatus Consultum*, are among the possible causes of the quick spread of these popular cults and their related instruments, including the frame drum, particularly in southern Italy and in Sicily. In these regions, as suggested by Livy in several reports, popular riots involving slaves, servants and oppressed people in general – including Spartacus, the well-known Thracian gladiator and his mate, a priestess of Dionysus – burst out frequently from the start of the second up to the middle of the first centuries BCE, at the initial emergence of the Roman Empire. The promise of freedom from sorrow and pain, from every kind of slavery, freedom for the women from segregation and, last but not least, the preservation of local values against the Roman rulers, continued attracting people from the lower classes and the frame drum kept on beating all over southern Italy for a very long time.

Regrettably, these popular rites are seldom documented in archaeology, and only a few clues about their content can be extracted from Latin literature and theatre. The upper classes, on the other hand, have left behind plenty of evidence showing that the cult of Dionysus was not effectively arrested by the *Senatus Consultum*. The god continued to be worshipped privately, hence in a different way, and the frame drum was featured as a ritual tool for restricted use. For instance, according to some Roman reliefs, originally placed in private spaces and displaying scenes of initiation, the initiate was wearing a hood and couldn't see the instrument while it was played. Even in the wonderful fresco from the *Villa dei Misteri* in Pompeii in which all the other musical instruments are clearly displayed, the frame drum is somewhat hidden by the cautious Silenus (Fig. 4).

Finally, during the period of the Roman Empire, with the growth of the Christian religion, there is a progressive diminution of these aristocratic rituals and related iconography while the core of the popular traditions appears to be lingering on right up to the present, being firmly established in southern Italy, thanks to its syncretistic capability.



Fig. 2 Phoenician-Punic statuette of a frame drum player from Es Culleram Cave, Ibiza, Spain. Replica: C. Jimeno Velasco.



Fig. 1 Bronze votive offering shaped in the form of a frame drum from the Idaean Cave, Crete. Heraklion, Archaeological Museum.



Fig. 4 Roman fresco from the Villa of the Mysteries (detail). Pompeii, Italy.



Fig. 3 Clay vessel shaped in the form of a maenad holding a frame drum, from Contrada Lucifero necropolis, Locri Epizefirii. Reggio Calabria, National Archaeological Museum.

2.13 Italic Pre-Roman Music Cultures

Mirco Mungari, Placido Scardina

Northern and Central Italic Music Cultures. Daniela Castaldo, in her book *Musiche dell'Italia antica*, found that the phrase “peoples without notes” applies to most cultures of ancient Italy. This phrase clearly outlines the situation of our knowledge about the musical aspects of the Iron Age Italic cultures. The complete lack of written sources (except gravestones and occasional signs on objects) obligates scholars to analyse other clues to sketch an overview, albeit vague and blurry, of the sound dimension of those populations.

In the early Iron Age, the northern part of the Italian peninsula was populated by several ethnic groups, connected by a common cultural matrix. These ethnic groups have been included in the definition of “Italic populations”. A linguistic, geographic and cultural boundary existed between these populations and the Etruscan population. The languages spoken by the Italic populations (known primarily from tombstones and inscriptions) belonged to the Italic Indo-European family (like Latin), whereas the Etruscan language was certainly isolated and not Indo-European. The territories settled by the various Italic populations included the north-eastern regions of the Adriatic coast (Venetians), the central Adriatic coast and hinterland (Picenians), the central and southern part of Apennines (Umbri, Osci, Samnites) and the region around the lower valley of the Tiber River (Latini) on the western coast of the peninsula. All these populations flourished during the early Iron Age (ninth - sixth century BC). Eventually, the Celtic invasion of the northern part of the Italian peninsula and the subsequent Roman expansion caused the assimilation and demise of these cultures.

Most information about musical activities among the Italic populations comes from iconographic sources. For example, a typical artefact of the Venetian culture, the *situlae* (conic vases made of bronze foil), is often decorated with depictions of musicians, most of whom are shown playing stringed instruments (lyres) or pan flutes (*sirínges*, curiously often related to military contexts) (fig. 1). Depictions of horn players, usually soldiers or warriors, allow us to

discern that this instrument was used in military contexts. The Venetian *situlae*, conic-shaped bronze vases with decorated surfaces, were common and distributed throughout the northern and central regions of the Italic peninsula. The instruments were precious gifts exchanged between the aristocratic families of the Italic populations. Their decorations were a vehicle for representations of urban and aristocratic activities, including the music-making. These representations are the only clues we have to interpret the musical activities of these cultures.

“Peoples without notes” does not mean “peoples without sounds”. Indeed, in considering soundscapes we must expand our consideration of soundscape contexts to address the question “What kind of sounds were common in the daily lives of these peoples?” rather than the question “How was music performed by these peoples?”. We have no archaeological finds that are unequivocally related to musical instruments from Iron Age Italic cultures other than the Etruscans. However, several sound-producers (objects surely related to sound production) were found during excavations and are currently exhibited and have been published. For example, clay and metal rattles of various shapes as well as bells worn as pendants or attached to harnesses or distaffs were dispersed throughout the aristocratic classis of the Italic Iron Age. These were particularly associated with female clothing and jewellery (fig. 2). Globular clay rattles, interpreted as objects associated with childhood, were also diffused throughout the entire Italian Peninsula.

(M. M.)

Southern Italic Music Cultures. Daunians, Oenotrians and Sicels are the most representative indigenous cultures that were settled in Southern Italy and Sicily during the Late Bronze Age and Early Iron Age. They were pre-Hellenic populations, directly or indirectly involved in the phenomenon of Greek colonization that ultimately led to the formation of Magna Graecia.

Daunian culture flourished during the Iron Age in the northern part of Apulia. The Daunian region corresponds for the most part with

the current province of Foggia. Its material culture is represented primarily by a remarkable ceramic production and, even more so, by the numerous stele. The scenes engraved on these objects constitute the most original form of Daunian artistic expression and one of the most vibrant and eccentric creations in the sphere of Italic art. Daunian images found on the stele include musical iconography. Some interesting examples are adorned with imagery connected to Daunian ritual performances. Moreover, they open up interesting speculations about the possibility of external influences from the eastern Mediterranean. Women, uniformly dressed in long tunics with characteristic long braids with circles at the ends, are depicted carrying offerings in processions. The circles at the ends of the braids may be outlining circular rattles. The women are accompanied by a cordophone player, whose instrument belongs to the round base typology. These scenes are quite common and almost certainly represent religious or ritual performances. There are also scenes of libation, such as one accompanied by a seated lyre player, a typical image in the Levant. This particular scene can also be observed on a stele, whose iconography recalls a similar ritual, on a low relief from Zincirli, in southern Turkey. The remarkable number of string instruments engraved on the Daunian stele must be considered in the broader context of the spreading iconography and possibly the increased circulation of lyres during this period in various areas of the Mediterranean, from Anatolia to the southwestern Iberian Peninsula. On these stele, in addition to chordophones, there are ornamental elements that are most likely representations of that were components of female clothing. These objects resemble sound-producing artefacts discovered in many graves in the Oenotrian area.

Oenotrian communities flourished during the Bronze Age and especially during the Iron Age, in a large region of southern Italy including Calabria, southern Campania and Basilicata. Much of the Oenotrian archaeological material related to music comes from funerary remains. Other than the numerous discoveries of sound-producing artefacts – rattles and shell trumpets – there are also

particularly interesting iconographic representations of musical activities. From a tomb in Sala Consilina comes a ceramic rattle from the sixth century BC decorated with four groups of pictures representing what are most likely different moments during a ritual ceremonial performance (fig. 3). One group displays a couple around a big round-base cordophone. (Note a similar scene on a *kantharos* found in an Etruscan tomb from Coste Saletti, Tuscania.) Another group depicts three characters in the act of dancing, or perhaps ritual boxing (or fighting). The third group depicts a scene of percussionists in which two characters strike an unidentified percussion instrument with two elongated sticks; the object struck is most likely a bilobate shield. The last image is of a dance performed by an armed figure carrying an axe. The big round base cordophone (represented as larger than the human figures) and his sound hold a significant symbolic importance. This appears especially clear when observing the scene on a sixth-century BC *kantharos* from the Oenotrian site of Guardia Perticara. This artefact was found among the grave goods of Tomb 115 (fig. 4). On this vase, a naked male character who may be dancing is shown in front of a large round-base cordophone. From the funerary sphere, there is another theme related to music: ritual lamentation. Ritual lamentation is depicted on eighth-century BC ceramic objects from Francavilla Marittima (Calabria) and Santa Maria d'Anglona (Basilicata) as well as on later artefacts from the historical period, such as the *Catarinella askos* (third century BC). The *askos* from Lavello (Basilicata) depicts a scene of the exhibition of the deceased's body, which is called *prothesis* in the Greek sphere. The mourning ritual ceremony associated with lamentation and funerary offerings is also accompanied by mourners with raised arms and players of various wind instruments, including a horn, a trumpet and a pair of double aerophones.

Regarding the Sicels, the indigenous people who lived during the Early Iron Age in the eastern part of Sicily, important finds include sound-producing artefacts such as bronze rattles discovered in the

graves of women. There are, however, few examples of musical iconography in the figurative art of the Sicels. Interesting is a large bronze krater from Monte San Mauro dating to the sixth century BC. The krater is decorated with a musical scene with fifteen characters. There are three groups of dancers dancing to the sound of double aerophones played by three men. The *phorbeia*, used by one of the

musicians, is evidence of its assimilation by the Sicels from the middle of the sixth century BC at Monte San Mauro. The imagery on the krater is based on Greek models (Corinthian, in particular) although it could reflect the musical and performative aspects of the ritual behaviours typical of the Sicels.

(P. S.)



Fig. 1 Detail from the so-called *Situla della Certosa*, 6th century BC. Bologna, Civic Museum.



Fig. 2 Picenian pectoral pendant from Urbino. Ancona, National Archaeological Museum of Marche.

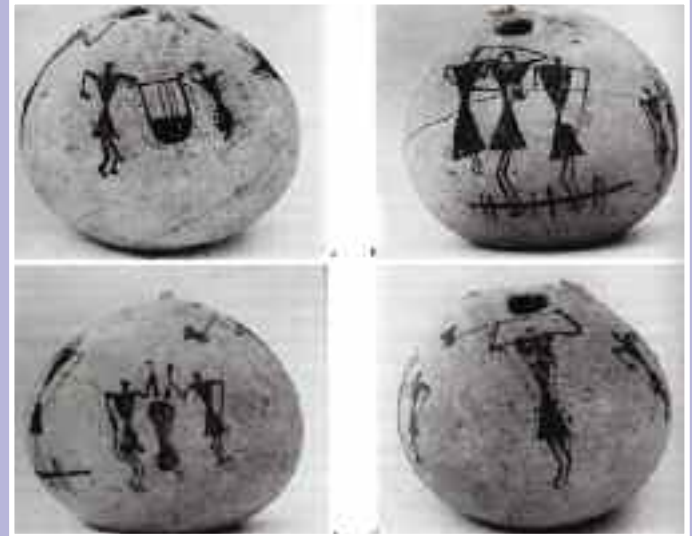


Fig. 3 Decorated rattle from Sala Consilina, mid-sixth century BCE . Padula, Provincial Archaeological Museum of Lucania Occidentale.



Fig. 4 *Khantaros* from Guardia Perticara (detail), mid-sixth century BCE. Policoro, National Museum of Siritide.

2.14 Sounding Spirals. A Strange Instrument

Placido Scardina

This musical instrument is remarkable as we have no evidence of anything similar after Classical Antiquity. It is made of bronze and assembled from fifteen spiral tubes which are connected to two perforated plates with volutes on the sides (Fig. 1). Originally, the plates were joined by fifteen wooden rods running through matching holes on either plate. Perfectly regular bronze spirals made of thin sheet covered the rods. The sound was apparently generated by the rotating spirals, which rubbed against one another when manipulated by the fingers, as is seen in ancient depictions (Fig. 2).

The scholar P. Zancani Montuoro, who named the object *chalcophone* because it is constructed from either copper or a copper-based alloy, was the first to consider that it might have a musical function. This particular specimen was discovered among the grave goods of a female burial (Tomb T. 60) in the Macchiabate necropolis in Francavilla Marittima (Cosenza, Calabria). However, various other examples of the same type of object have been recovered in funerary contexts in graves from the eighth century BCE belonging exclusively to women of the Oenotrian area (Calabria and Basilicata regions) of southern Italy. These chalcophones were found along with other idiophones, including rattles which hung from the dresses in which the women were buried, as did other ornaments. Similarly, the specimen from Francavilla Marittima was found with other sound artifacts which appear to identify the deceased woman as an important figure in the Oenotrian community, perhaps a dancer/musician who performed in the context of ritual ceremonies. The bronze-spiral instrument found in her grave is the best preserved and largest of its kind.

The interpretation of these objects as musical instruments is based on a relief on an ivory box from Nimrud (Fig. 2) in the Near East. Produced in the eighth century BCE, most likely in northern Syria, this so-called *pyxis* depicts a procession of five female musicians. The identity of the two instruments represented on the *pyxis* remained unclear for quite some time. They were variously identified as psalteries, xylophones and washboards, all of which

resemble the instrument discussed here. The *streculatòre* (or *struvulatòre*), a kind of washboard used in the popular music traditions of Abruzzo and Molise, resembles the instruments on the *pyxis* but the discovery of the object from Francavilla Marittima clearly identifies the instruments represented on the *pyxis* from Nimrud as belonging to the same class. In addition, the *pyxis* also tells us about the performance technique as: the women's fingers are shown scrolling up or down in order to make the metal sound.

Francavilla Marittima, possibly the site of the ancient city Lagaria, was a very dynamic cultural and commercial entity and open to external influences. Thus, it is not surprising to find an instrument there which derives from the Near East. Indeed, objects actually produced in the Near East have also been found in other tombs of the necropolis of Macchiabate. These include a Phoenician bronze bowl with low relief decoration as well as Egyptian and Syrian scaraboid seals. The Syrian seals include the largest example of the so-called Lyre-Player Group, a particular type of seal which was apparently produced for European markets.

An instrument closely resembling that from Francavilla Marittima appears somewhat later, in the late fourth century BCE on Apulian vases; it being traditionally referred to as the Apulian or Italic *sistrum*. The instrument type reappears for its final showing in the Hellenistic age in its presumed place of origin – Syria. At least eleven terracotta figurines of women from Kharayeb include representations of the instrument while it is played or held. Two of these representations also involve tambourines.

As a hand-crafted product which travelled from the eastern to the western Mediterranean, this instrument played its part in the typical circulation of goods in the mid-eighth century BCE, in which products from northern Syria were especially prominent. As a carefully crafted sound tool, it had without doubt important symbolic meanings, perhaps forming an acoustic marker of high status. Belonging to women of indigenous Oenotrian communities, it was probably used in ritual ceremonies in which music was involved.



Fig. 1 Chalcophone from grave T. 60 of the Macchiabate necropolis, Francavilla Marittima. Sibari, Museo Nazionale Archeologico della Sibaritide.



Fig. 2 *Pyxis* from Southeast Palace of Nimrud (eighth century BCE). London, British Museum.





Music Cultures in Antiquity

3.1 Ancient Greece. The Birth of Music

Stefan Hagel

Music, of course, is as old as humanity – or it may be even older, depending on how one wants to define it. Music is universal as well. Is it not odd, if music is so universal, that most European and quite a few non-European languages share local variations of always the same term for it: *music*, *musica*, *musique*, *musik*, *musikk*, *musiikki*, *muzik*, *musziek*, *müzik*, *muzyka*, *музыка*, *музыка* etc.? Why is it that so few western nations seem to have developed a native term for such an omnipresent phenomenon? Was it because all the different ways of music-making – singing, dancing, clapping, playing various instruments – obscured the perception of a single underlying concept? Are we justified in positing such an underlying concept at all? If it defies being named in so many languages except by a borrowed word, is the idea of *music* really so universal?

In any case, it is clear that western culture has adopted a shared notion of music. Even if ethnomusicologists might struggle to properly define the subject of their field of study in foreign cultures, they are bound to do so starting from their own identities as ethnomusicologists. The same is true for music-archaeologists, for whom a central issue is whether evidence from the past can be identified as relating to *music* in any sense. However, without the idea of *music* as a kind of anthropological constant, how can one even begin to ask questions of a music-archaeological nature?

The word is Greek. Originally, it was an adjective, sharing its ending “-ic” with so many other things the ancient Greeks pinned down linguistically: epic and lyric, tragic and comic, arithmetic and geometric, rhetoric and dialectic, aesthetic and ethic, semantic, philosophic and cosmic... All this being part of an intellectual movement in which one strove not only to *do* things properly (e.g., calculating, dividing land, speaking, or tuning an instrument), but also to understand by what principles proper action was taken. Instead of simply teaching ways to calculate, the field of mathematics was invented as a science based on axioms, self-evident first principles. Astronomy extended beyond the recording and prediction of the movements of the planets to encompass the

search for the cosmic geometry that accounted for their movement. Musicians, instead of simply tuning their instruments according to age-old prescriptions, started to ask what it is that makes some tunings harmonious but others not harmonious at all. It was those new crafts, which blended knowledge and skill, that were named with the aforementioned adjectives, in their feminine form: *mousiká* (or its equivalent *mousiké* in the dialect of Athens), the “craft of the Muses”. For all we know, music may have taken the lead in this. At least, it seems to be attested prior to all the others, in poesy as early as the first half of the fifth century BCE. One of the three earliest references to “music”, a verse by Epicharmus, praises a lady as

“she who is well-voiced, equipped with all the *mousiká*, a lover of the lyre.”

It is fascinating to see how the inclusiveness of the new concept – “*all* the music” – is expressly stated here. Indeed, the conception of *music* as a field encompassing various crafts had been anticipated in myth, where the Muses figure as the divine musicians par excellence, together with Apollo. On the other hand, early texts and images portray the Muses as singers and dancers, the ideal maiden chorus, while their association with instruments developed only later. Perhaps the Muses did not inspire the inclusiveness of the conception of *mousiké*, after all, but owed their multiple skills to this very ideal?

The invention of “music”, it seems, went hand in hand with the conception of music theory. A composer named Lasus is credited with writing the first book on music approximately 500 BCE, and the following generation seems to have made great progress in analysing the elements of musical scales – specific intervals arranged in particular patterns. At the same time, music became connected with physics and mathematics with the startling discovery that beautiful intervals correspond to simple ratios. These ratios were evident in the distances between finger holes on

woodwind instruments as well as in the thicknesses of sounding metal discs; later exact measurements were taken on experimental string instruments. From the few surviving records, we can glean that this was a period of genuine musical experimentation no less than a time of intellectual analysis. The common notion of mathematical music theory advanced primarily by Pythagoreans does little justice to the thriving climate of competition on many levels. An improved understanding of the relationships between various scales was no academic enterprise, but one that might have led one to develop innovative instrument designs and thus achieve fame and considerable wealth at musical contests.

At the end of the fourth century BCE, the time was ripe for syntheses that would last for many centuries, informing the Middle Ages as well as the musical revolution of the Renaissance, as a consequence of the rediscovery of the Greek texts in Europe. However, the very refinement of ancient music at that period prevented the development of a single unified theory of music. On the one hand, the faction grounded in physics and mathematics produced a treatise known as the *Division of the Canon*, which derived (albeit with two logical flaws) an algebraic theory of consonances and a model scale, on the basis of agreed principles and an almost-modern theory of sound. However, with this approach it was not possible to explain the complex modulating melodies of

Late-Classical compositions. For such an endeavour, another strand of *harmonics* was required. Aristoxenus, student of Aristotle, devised a comprehensive diagram of musical notes – which was in fact so comprehensive that our modern western system is but a small subset of it, lacking Aristoxenus' microintervals of a quarter, a third or three eighths of a tone as well as some odd larger intervals. His radically pragmatic approach however required severing all bonds with Pythagorean number theory, thus establishing music theory as a science fully independent from physics, deriving its basic tenets directly from human (or, more specifically, ancient Greek) musical perception.

The ensuing rift in musical thinking has continued to plague theorists as well as instrument makers well into modern times. On the one hand, the theory of Aristoxenus eventually led to the adoption of equal temperament on many instruments. The fascination with true harmonies as beautifully expressed in mathematics, on the other hand, continued to inspire astronomers and physicists. It was ultimately the desire to apply the same kind of mathematical beauty to a description of the universe as a whole that gave rise to modern science. Thus, the birth of *music* in Classical Greece was also, in a sense, the birth of the modern Western worldview.

3.2 An Alphabet of Sound. The First Known Melodic Notation

Stefan Hagel

Around 800 BCE, some Indo-European peoples transformed the long-existing Semitic consonant scripts into true alphabets; for the first time, vowels such as “a” and “o” were treated exactly like consonants such as “t” or “l”, in spite of their very different natures. In this way, language came to be understood as a flow of sound that can be entirely analysed into a very limited set of components, expressed as letters (accents were later introduced to account for the pitch dimension of speech). Best known among these revolutionary writing systems is the Greek alphabet, which required only about two dozen signs. Almost immediately, these were also used to record songs – short stanzas as well as epics of many thousand lines. However, even though song texts were transmitted in this way through the centuries and up until modern times, the melodies still remained ephemeral, left in the hands of the performers who handed them down orally, with all the transformation over time that such a process entails.

About three hundred years later, the Greeks had analysed the pitches of their music just as well as the constituents of their language. In the context of emerging music theory, they then created an alphabet of sound, capable of recording melody. Ancient handbooks transmit the late stages of this system, when it had grown to encompass no less than fifteen keys, separated by semitones, spread out over more than three octaves, and including not only the melodic intervals of tones and semitones familiar to us, but also the exotic quartertones with which the Greeks prided themselves; these quartertones were considered to establish the most beautiful music. The basis of this notation was letters, one letter for each note (though the details are complex, as a letter’s pitch may depend on the musical context). The origins and evolution of this system of notation are not directly attested, but may be gleaned from certain peculiarities of the system. First, it seems, a series of arcane-looking letter triplets was devised, where rotated

and mirrored letter forms stood for pitches a quartertone and a semitone above basic notes. This practice almost certainly derives from the playing of the doublepipe, where such pitches were produced by partially uncovering finger holes. Later, modulations were accounted for, and finally a second, less arcane series of signs was invented mainly for singers, replacing the older signs with the letters of the alphabet (or modifications of these at either end where the system extended beyond the alphabet’s twenty-four signs).

This notation was used by professional musicians much more than by theorists (though theorist-musicians had played a crucial role in its development). We have fragments of scores from the third century BCE through to the fourth century CE. Most of these are scraps of papyrus, but there are also a few stone inscriptions, and even a handful of songs and instrumental exercises that were copied from ancient practical handbooks by medieval scribes.

In a culture whose instrumental music was based on doublepipes played in harmony and strummed lyres, it is certainly fascinating to find a notation that focuses exclusively on melody: hardly ever do the scores preserve even the slightest hints of accompaniment or harmonisation. This doubtless reflects the nature of ancient Greek and Roman professional performances which were commonly accompanied only by a single instrument: in this way, the players were able to showcase their individual capabilities.

Quite the opposite was apparently true for the single earlier culture from which we have musical notation. In the Late Bronze Age, around the middle of the second millennium BCE and a thousand years before the Greeks, scribes in the cosmopolitan city of Ugarit recorded the music of religious hymns on clay tablets. They used traditional terms for pairings of notes, as had been used by musicians and known by scribes for at least several centuries, so that we know their meaning from other cuneiform sources. Apparently, this type of notation documented only the basic

harmonies. Such a practice seems natural in a culture of court and temple orchestras which would need such information in order to play together. The melody, on the other hand, did not need to be written because it was known to the singer, who perhaps extemporised an ornamented song on the basis of traditional patterns. Consequently, for us this cuneiform musical notation

remains an abstract recording of harmonies, devoid of both the original melody and rhythm, and the scores remain silent. The small preserved treasure of ancient Greek notated music, in contrast, uniquely allows us to study and ultimately to perform music from two thousand years ago.



Fig. 1 Seikilos Stele. Tralles, Turkey (100-150 CE). Copenhagen.National Museum of Denmark.



Fig. 2 Seikilos Stele (full text). Tralles, Turkey. (100-150 CE). Digital image, STARC, Nicosia / STARC, Nicosia.

3.3 Music in Ancient Greek Sacrificial Ceremonies

Jana Kubatzi

Ancient Greek sacrificial ceremonies, which consisted of a solemn procession (*pompē*), an altar sacrifice, a celebratory meal and artistic and sporting competitions, were feasts for the senses. Incense and myrrh were burned; men, women and children were dressed in festive attire; cattle, sheep and hogs were adorned and brought to the altar in gala processions, and everywhere there was something to see or hear: the members of choirs danced and sang, epic poems were recited, plays were enacted at various altars to the gods, and the air was filled with the sounds of *kithára*, *lýra*, *aulós* and trumpet (Fig. 1). The musical performances at such sacrificial ceremonies were collectively known as *mousiké*, the art of the muses, after the introduction of this concept by Pindar (fifth century BCE). *Mousiké* differs from today's use of the concept of "music" in its multiple meanings. Today we understand music as structured sounds produced with voices or musical instruments; it no longer incorporates, as it did in ancient times, the theatre, poetry and even philosophy.

Sacrificial ceremonies were the central element of ancient Greek cults. Important events like the birthdays of gods, victories and harvests were generally celebrated with a sacrificial offering at the altar of the relevant deities and music was an integral component. The *aulós* – a Greek reed instrument made up of two pipes – played a key role in this context. Depictions on Greek vases from the most notable period of Greek art (sixth to fourth centuries BCE) frequently show this instrument in scenes incorporating altars or cultic processions (Fig. 2). Ancient texts likewise mention the *aulós* far more often than other musical instruments in connection with sacrificial ceremonies. There also seems to be an inherent connection with the act of animal sacrifice itself, during which the *aulós* is frequently depicted. Libations of wine, oil, water, milk or honey are also frequently accompanied by an *aulós* in the iconography.

The conspicuous pictorial representations of and literary references to the *aulós* as used in sacrificial ceremonies call for an

explanation. This is especially true because earlier images of celebrations – dating from the seventh to the beginning of the sixth centuries BCE – feature neither the *aulós* nor cultic processions or altar scenes. Instead, images from that period often depict circular dances. Such dances symbolised a jointly-celebrated festival, be it for the gods, the deceased as part of a funeral service or those present at a wedding. It has been pointed out by archaeologist Yosef Garfinkel that in the region encompassing the Mediterranean countries and western Asia, circular dances are the very earliest scenes which depict such joint activity. According to what we know from images and written records, these dances were often accompanied by stringed instruments, generally lyres. From the third millennium BCE in Mesopotamia, and later in Phoenicia and the other countries of Asia Minor, stringed instruments were also associated with kings and prophets, enabling contact with the gods as well as giving voices to the gods.

The *aulós*, in contrast, is prominently associated in later Greek literature with the cults of the gods of ecstasy, Dionysus and Cybele. The tone quality of the *aulós* was capable of putting listeners under a spell, enchanting them. According to the sources, it could be used to generate sweet as well as spine-chilling and wild music, and thanks to the technique of circular breathing, a continuous sound could be produced. This explains both the great popularity of the *aulós* among all segments of the population and the use of the *aulós* during acts of animal sacrifice at the altar. Its moving, psychoactive sound suited the killing of the sacrificial animal better than the gentle notes of the *kithára* or *lýra*.

On the other hand, the popularity of the *aulós* in processions can be explained by its much louder volume compared with that of stringed instruments. This meant that the music of an *aulós* was more easily heard by a large group of celebrants. It is no coincidence that the Greek population had increased considerably in size at the time when circular dances with lyres were replaced by processions accompanied by the *aulós*; this being towards the end of the

seventh century BCE. It became increasingly unrealistic for the greater number of people in a city or community (*pólis*) to participate in a circular dance, but everyone was obliged to participate in rituals regularly to renew their identification with the city. However, circular dances were probably no longer an adequate means for fostering a common identity and were thus replaced by cultic processions, in

which far more people could participate, shifting the focus from a small aristocratic elite to a larger part of the population. The changes in representations of festive scenes on ancient vases and the increasingly dominant position of the *aulós* in the depictions of celebrations should be interpreted against this background.



Fig. 1 Procession of two auletes and two kitharists. On the other side of the vase a sacrificial act is shown. Attic black-figure Amphora (540/530 BCE). Berlin, Antikensammlung.



Fig. 2 Sacrifice procession with aulete to Athena Promachos. Boeotian lekanis (middle of sixth century BCE). London, British Museum.

3.4 Being the Best. Musical Contests in Antiquity

Stefan Hagel

Competition loomed large in many ancient societies, manifesting itself also in institutionalised contests. In cultures which left no texts these will usually elude us, unless we find depictions of sports such as boxing or wrestling, perhaps in the context of feasts. However, not all societies foster contests equally, as these are based on the notion that those who publicly compete with each other are, at least in principle, equals. This fitted in particularly well with Greek communities from early times onwards, even though the circle of equals there originally focused on aristocratic elites, which did not everywhere open up to more inclusive structures. So we find the desire to surpass one's fellows (and win undying fame) expressed as the motor of Homeric warriorship:

“Always to be the best, to stand out among all others” (*Il.* 11.784)

Similarly, the *Iliad*, as Europe's earliest narration, also holds her earliest description of a sports competition, organised and generously funded by Achilles as a memorial event for his fallen friend Patroclus. Music does not form part of it – perhaps only because the military camp before Troy is not envisaged as hosting professional singers. Yet we know that even at Homer's time, musical contests existed: Hesiod, whom later generations imagined to have triumphed over none less than Homer himself, mentions his victory at a competition:

“From there I travelled to the memorial games of wise Amphidamas and to Chalcis: his magnanimous children had announced many prizes that they would award. There, I say, I was victorious with my song and carried away a tripod adorned with handles.

This I set up for the Muses of Mount Helicon,
at the place where they first made me step on the path of song.”
(*Works and Days*, 654–659)

It is also Hesiod, who first acknowledges Competition – the kinder form of Eris, divine Strife – as the driving force behind his society:

“It is her who stimulates even the helpless to work:

whoever is not getting his work done looks at another man,
a rich one, who is quick to plough and to plant
and to set his household up well – neighbour envies neighbour
in his struggle for wealth: this Eris is well for the mortals!
Potter grudges with potter, builder with builder,
beggar envies beggar – and singer, singer.”
beggar envies beggar – and singer, singer.”
(*Works and Days*, 20–27)

Indeed, winning valuable prizes, such as a large iron tripod in Hesiod's case, would have liberated a singer-poet from a life of hardship, and the fame associated with prestigious victories might have ensured patronage, perhaps at a tyrant's court, or well-paid requests for compositions celebrating important events in the lives of individuals as well as cities. There certainly was reason for envy among musicians in Archaic and Classical Greece, and throughout Antiquity.

If individual festivities such as funerals had been the most important occasions for setting up competitions in early times, the focus soon shifted to regular events, in the context of local or, most importantly, all-Greek (“Panhellenic”) festivals. The most prestigious were the Pythian games held at Apollo's sanctuary at Delphi, celebrated as the navel of the earth. Unlike in Olympia, musical contests were here at the heart of the festival, sports coming only as a later addition. The art forms held in highest esteem were those for soloists. Singing to the *kithára* was valued most, followed by playing the doublepipe, including a musical depiction of Apollo's fight with the giant serpent by which the god was told to have attained his sanctuary. Purely instrumental *kithára* music, on the other hand, and singing to somebody else's accompaniment on the pipes was somehow considered second-class and awarded smaller prizes.

Among city festivals, the Panathenaea of Athens are perhaps best known. These combined athletic and musical competitions, famously including recitation of the Homeric epics as well. Other events also awarded prizes for heralding or playing the long straight trumpet. However,

it was another Athenian institution that had the greatest impact on western culture. At the Dionysia, dances of singers honouring the god of wine evolved into fully fledged drama, including actor-singers alongside the traditional chorus. Both tragedies and comedies were produced, the latter being prominent also at the festival of the Lenaia. Once more, the rapid evolution of these new forms was driven by the spirit of competition. Each year, three pre-selected tragic poet-composers and up to five comic poet-composers competed for victory, each with his chorus, chorus trainer, piper and the *khoregós* who had funded a production. Victory included the opportunity to inscribe one's success within the city's memory by setting up a monument bearing the awarded tripod in a prominent place, contributing to a "Street of Tripods" next to the theatre.

While Greek drama, as it was invented in the fifth century BCE, is the direct precursor of both modern drama and opera, ancient Greek music as such evolved even more rapidly in another genre: dithyrambs. Also staged at the Dionysia, twenty of these were performed by large choruses of fifty men or fifty boys, recruited from each of the ten "tribes" of Athens. As a result, a significant portion of the free male population would have taken part in a musical competition at one time or another. The dithyramb appears to have liberated itself more easily from traditional formal restrictions such as the strophic nature of the dance-song, paving the way to experimentation with all kinds of musical imitation illustrating the lyrics. Unlike the most famous tragedies and comedies, the texts of dithyrambs are almost entirely lost – probably a sad side-effect of the more prominent role that the musical aspect played in these performances. Here also, victories were commemorated, and the producers would seek to contract a world-class instrumentalist to provide the doublepipe accompaniment. It was particularly the striving for dithyrambic novelty that provoked the opposition of conservative minds like Plato's, who deplored the fact that musical judgment had practically passed from the hands of a few selected old men to the riotous applause of philosophically uneducated masses.

Even though we are unusually well-informed about Athens, musical competitions were established at various lesser-known festivals in

many cities of the Hellenised world and later throughout the Roman Empire. With so many events, the cities effectively competed between themselves for the best participants by awarding prizes often worth several years of a simple worker's income. The virtuosos' lives thus included a lot of travelling, selectively choosing which festivals to attend, according to their own skills and those of the competitors expected at each festival. Little detail is known. Often we know of once celebrated stars only from their broken tombstones, which recount particular series of victories that the deceased had been the "first and only" to achieve. At any rate, such contests, along with the theatres and concert halls built all around the Mediterranean and beyond, ensured the continuation of a thriving professional musical culture up until Late Antiquity.

The virtuosos did not come out of nowhere – there were schools with a strong emphasis on music, as we know from a founding inscription from Teos, dated to the third century BCE. There, music was taught over a period of two years in theory and practice, and the music teacher was much better paid than the teacher of letters. Moreover, the same city held internal competitions among schoolboys, competitions which were deemed important enough to record the winner lists on stone. They comprised not only lyre playing with and without song, playing the doublepipe, dramatic performance and dancing with armaments, but also "writing rhythm" and "writing melody" – most probably two forms of competition in composition.

The whole system of an international music culture fuelled by competition, as it was tied so closely with the festivals of various gods, received a major blow at the end of the fourth century CE when Emperor Theodosius banned all pagan events. Thereafter, instrumental music, which was condemned by most eastern church fathers and eyed with great suspicion by the western churches as well, appears to have retreated for the most part into the private sphere. The exception, of course, was music that contributed to the display of power in official ceremonies of the state, where there was much less room for competition among individual musicians.

3.5 Music among Phoenician and Punic Communities

Mireia López-Bertran, Agnès Garcia-Ventura

Phoenician communities were descendants of the ancient Canaanites, and they created a web of city-states (e.g., Tyre, Byblos, etc.) along the Levantine coast. These cities developed interregional trade with the Near East and the eastern Mediterranean. From the ninth century BCE, some Phoenician traders expanded their commercial networks to the west and created neighbourhoods in significant indigenous centres or colonies in territories, some of which were occupied by local populations, others being unoccupied. One of the most important colonies was Carthage (Tunisia). From the sixth century BCE, Carthage initiated an economic expansion in the western Mediterranean, creating a web of settlements in Sardinia, Sicily, Ibiza, North Africa and the southern Iberian Peninsula. The Punics are considered to be descendants of the Phoenicians, both in cultural and social terms. This Punic label is not exclusively attached to the citizens of Carthage, but applies also to various peoples, including indigenous populations, former Phoenician inhabitants of the Carthaginian colonies, Carthaginians themselves and people from North Africa who lived between the sixth and the second centuries BCE.

For the study of Phoenician and Punic music, we have available a rich repertoire of images representing musicians on metal cups, terracottas, razors and stellas. Most of these artefacts have been found in the central Mediterranean, primarily in Carthage, Sardinia and Sicily. We can also study the acoustic properties of caves and shrines in order to reconstruct Phoenician and Punic soundscapes. In addition, some musical instruments, such as cymbals and bells, have been found and literary sources make some references to Phoenician and Punic music.

The instruments that appear in the iconography are aerophones, membranophones and cordophones. A comprehensive approach to the topic highlights two key issues. First, membranophones (frame drums) are the musical instruments most often represented. Second, there is a massive number of females depicted as musicians. It is worth noting the changes that occur in the

representations of musicians. In the eastern Mediterranean, the artefacts are metallic cups associated with the elite as well as clay figurines, which indicate a Near Eastern influence. From the sixth century onwards, new artefacts appear, such as funerary stelae or razors, and the terracottas become standardized through the use of moulds. This latter iconography reveals a clear Greek influence.

In the Iberian Peninsula and Ibiza, the terracottas of musicians are the key artefacts. The disparity between the number of artefacts in these two regions is remarkable. Whereas in Ibiza the material culture is rich (eighteen figurines), there is only one figurine from Iberia (from Cádiz). The terracottas are found mostly in the main cemetery of the island, Puig des Molins, and in some shrines, such as the Es Culleram cave and Puig d'en Valls. These images represent frame drum and doublepipe players. The figurines with frame drums can be divided into two groups: most of the figurines hold a small drum hold in front of and perpendicular to the body, while a small number of them hold a bigger drum beside the body and not in contact with it. All the figurines with doublepipes from Ibiza present the instrument parallel to the body and attached to it, while the figurine from Cádiz is represented with the doublepipe in a more horizontal position that is almost perpendicular to the body. The differences between the instruments' positions appear to be the result of the use of different moulds in manufacturing the figurines rather than indications of variation in playing techniques.

From the study of these terracottas, it is clear that music played a key role in Punic tasks (arrays of related activities), and that it might have had multiple meanings. Indeed, the existence of figurines as funerary votives together with the incised musicians on funerary stelae and razors highlights the role of music in mourning and of dancing in the performance of rituals. Music was also played during other rites, probably those related to feminine practices, as well as ones in daily life, as the figurines recovered from the settlements indicate.

Most of the clay figurines are of females, and it has been said

that they represented deities, primarily Astarte. However, it seems more probable that they represented upper-class women. This hypothesis is corroborated by written sources that reported how high-status women from Carthage possessed musical skills. It was written, for example, that Sophonisbe, Asdrubal's daughter, was famous for her beauty and for being an accomplished musician. Details of the figurines themselves reinforce this idea, as the women are shown wearing decorated fabrics and jewellery. Furthermore, female terracotta figurines are linked to the life cycle (e.g. funerary

rituals). This allows us to propose that the relationship between women and music was related not only to the performance of music by women, but also to the role of women in birth, caring for members of the society and death. Thus, it appears that both frame drum and pipe players were associated with fertility, renewal and protective rituals, as evidenced by the pregnant doublepipe player from Iberia.



Fig. 1 Map of the Mediterranean with the areas and settlements mentioned in the text.



Fig. 2 Razor from a Punic grave (Puig des Molins cemetery, Ibiza), imported from the eastern Mediterranean, probably Egypt, showing a woman playing a frame drum. The other side is decorated with a hawk. Madrid, Museo Arqueológico Nacional.



Fig. 3 a. Figurine from Puig des Molins cemetery. Madrid, Museo Arqueológico Nacional. / b. Figurine from Es Culleram cave shrine. Madrid, Museo Arqueológico Nacional. / c. Figurine from Puig des Molins cemetery. Ibiza, Museu Arqueològic d'Eivissa i Formentera.



Fig. 4 a. Figurine from Es Culleram cave shrine. Madrid, Museo Arqueológico Nacional. / b. Figurine from unknown provenance. Madrid, Museo Arqueológico Nacional / c. Figurine from Puig des Molins, votive deposit. Ibiza. Museu Arqueològic d'Eivissa i Formentera.

3.6 Crossroads. Musical Instruments in Etruria

Emiliano Li Castro

The great importance of music in Etruscan civilization is attested by several ancient Greek and Latin authors, who place a strong emphasis on the aerophones such as *auloi*, conches, horns, and trumpets of various kinds — namely the Latin *cornu*, *lituus*, and *tuba*. This assertion has been confirmed in recent times by various scholars, who also take into account the large number of musical instruments and the wide range of iconographic evidence that has been found at Etruscan sites spanning from the beginning of the seventh century to the first century BCE. While the only specimens that survive are, of course, those made of non perishable materials like metal or clay, the iconographic evidence — such as the tomb paintings and other kinds of representations — clearly shows that almost all of the musical instruments that were widespread in the Mediterranean at the time were also used in Etruria on many different occasions, including public and private ceremonies, rituals, and daily life.

Wind instruments (aerophones). Pipes. Several ancient Greek and Latin literary sources point out the close relationship between the Etruscans and the world of sound tools, particularly instruments belonging to the “aerophone” family of wind instruments. The most common of these is the double-tube reed aerophone (Fig. 1), known in Greek as the *aulos* and in Latin as the *tibia*. With regard to its Etruscan name, it can be observed that the Latins applied the term *subulo* to the Etruscan player of this instrument, indicating that the Etruscan word *suplu* refers to the player of this instrument, if not to the instrument itself.

As for the materials from which the *tibiae* were made, Pliny the Elder provides some specific information: the Etruscan doublepipes played on ritual occasions were made of boxwood, while the instruments played for entertaining were made of lotus wood, donkey bone, or silver. Due to the perishable nature of the wood, only rare examples have survived. The large volume of iconography related to music produced by the Etruscans provides further information as well as confirmation as to how instruments were

used. For one example, musicians and dancers are represented in tomb paintings with surprising frequency and the doublepipe is by far the most represented instrument.

The reed, an important part of the instrument which exerts great influence on its sound properties and playing techniques, is unfortunately the most fragile part, so no Etruscan reeds have been found archaeologically. In addition, in almost all extant depictions, the musicians are shown playing but the reeds cannot be seen, as the mouthpieces are depicted inside the mouths of the performers. Nevertheless, since this ancient doublepipe was certainly a reed instrument, as demonstrated by the iconographic evidence, which always depicts players with their cheeks distended, the current practice, however common, of referring to it as “double flute” is a mistake, incorrect from an organological point of view.

Trumpets. Another group of aerophones, very well attested in ancient literary sources, includes all sorts of trumpets, from those fashioned from a conch (Fig. 2) to those made of copper or bronze. In the ancient classical sources, the trumpet is usually presented as an Etruscan invention. It is frequently represented in iconography and is common in the archaeological record. These long Etruscan trumpets were designated by the Romans with three terms for their different shapes: *tuba*, *lituus* (Fig. 3a-b), and *cornu* (Fig. 4).

While the bronze mouthpieces of all surviving *cornua* are preserved, either open (as on a conch trumpet or horn) or restricted (as on a modern trumpet or trombone), this important part is missing in most of the *litui* that have been recovered. These mouthpieces may have been made of perishable materials such as wood or bone.

Finally, some horns made of ivory or clay can be added to the list of wind instruments from the Etruscan area (Fig. 5).

Flutes. The last two aerophones to be included in the archaeological record of Etruscan civilization are the Pan flute or *syrinx* (Fig. 6) and the transverse (or side-blown) flute.

String instruments (chordophones). Although the family of wind instruments is the one by far the most often mentioned in

ancient Classical sources, the most represented group in iconography, and seemingly the dominant player in the Etruscan soundscape, string instruments are also widely attested. Remnants of such perishable instruments are not known, or not yet identified, but several plectra, usually made of ivory and displaying elaborate shapes, have been discovered in burials from various sites of Etruria (Fig. 7).

All of the string instruments represented in Etruscan iconography belong to the same family as the Greek *lýra*, *bárbiton*, and *kithára*. They show the usual features of the Greek models and clearly indicate their extensive adoption. The only exception to this rule could be the imposing “concert *kithára*” so often painted on black- and red-figure Attic vases, which was certainly known, but perhaps not so much used, by the Etruscans.

Percussion instruments (idiophones and membranophones)

Idiophones. The oldest sounding tools from the pre-Etruscan period are the pear- or gourd-shaped clay rattles, decorated with thin sheets of tin, from the Early Iron Age burial sites of Tarquinia and Verucchio, dated to around 900 BCE. Several rattles of similar shape and size, very often decorated, have been discovered at various sites in central Italy; most of these are made of clay (Fig. 8)

except for some other bronze rattles from various Etruscan sites (Fig. 9). In addition, some small bronze idiophones, such as bells, *tintinnabula*, and other sounding objects, have been found in Etruscan sites but none of these instruments is represented elsewhere or mentioned by ancient sources. The only type of idiophone that is clearly and widely represented in iconography is a sort of large thick castanets which, after the Greek term, the Latins called *crotala*. They are always shown being played by dancers, and may have been made of perishable material like wood, because no surviving example is yet known.

Membranophones. Despite the wide diffusion of membranophones all around the Mediterranean area during the same period — particularly the frame drum, called *tympanon* in Greek and *tympanum* in Latin — this class of instruments is the most puzzling and elusive aspect of the Etruscan musical tradition. No evidence of this instrument exists in the archaeological record, not a single mention is made by Greek or Latin authors, no surviving depictions in tomb paintings exist, and it would appear that the Etruscans seldom depicted frame drums — or any other kind of drum — anywhere else. If the Etruscans were beating their drums, they indeed have kept that beat secret for a long time.



Fig. 1 Tomb of the Leopards (detail). Monterozzi necropolis, Tarquinia, Italy (ca. 470 BCE).



Fig. 2 Shell trumpet. Poggio dell'Impiccato, Tarquinia, Italy (first half of the eighth century BCE). Florence, National Archaeological Museum.



Fig. 3a Bronze trumpet (*lituus*). Pian di Civita, Tarquinia, Italy (ca. 675 BCE). Replica: P. Holmes.



Fig. 3b Bronze trumpet (*lituus*). Tomb of the Reliefs, Cerveteri, Italy (end of the fourth century BCE). Reconstruction: J. Creed / P. Holmes.

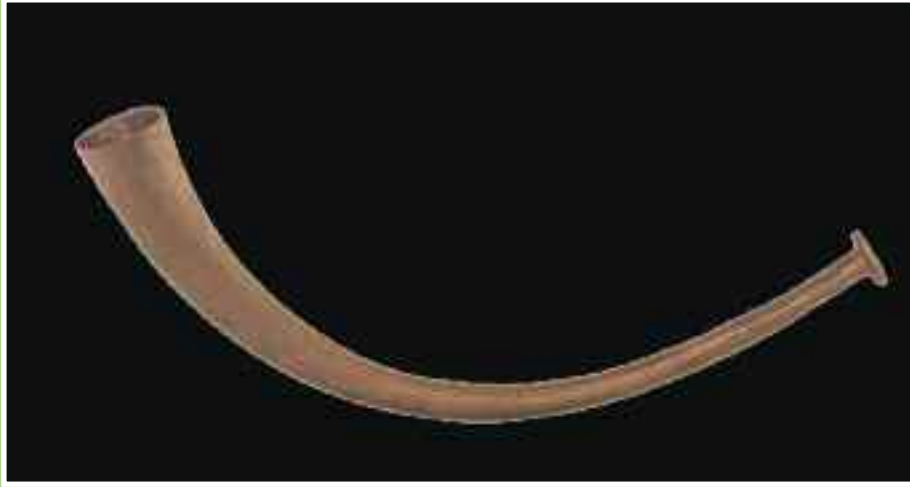


Fig. 4 Bronze horn (cornu). Tomb of the Chariot, Populonia, Italy (ca. 650). Replica: C. Brignola.

Fig. 5 Clay horn. Civita Castellana, Italy (550-500 BCE). Replica: C. Brignola.



Fig. 6 Bronze figurine of a satyr playing a syrinx. Coll. Richard Payne Knight (end of the fourth century BCE). London, British Museum.



Fig. 7 Ivory plectrum. Montetosto, Tomb 1, Cerveteri, Italy (seventh century BCE). Rome, National Etruscan Museum of Villa Giulia.



Fig. 8 Tomb of the Leopards (detail). Monterozzi necropolis, Tarquinia, Italy (ca. 470 BCE).



Fig. 9 Clay rattle. Cavalupo necropolis, Vulci, Italy (ca. 700 BCE). Replica: C. Brignola.



Fig. 10 Bronze rattle. Chiusi, Italy (600-500 BCE). Replica: C. Brignola.

3.7 Sounds for Life and Death in Etruscan Tombs

Marina Micozzi

Etruscan art provides us with a vast selection of musical scenes. It is thanks to these images that we can observe the use of several musical instruments. Some of these instruments are also attested by archaeological evidence, while others are only known through the iconography.

These Etruscan scenes confirm the ancient literary sources' statements about the importance of music in Etruscan life, showing, as they do, numerous situations (war, hunting, banquets, dance, sports competitions and religious and civic rituals) which required the presence of musicians. Most of these representations are from funerary contexts. Although these images are associated with death, we can use them as a starting point for understanding the role of music in daily life.

Most scenes show music as it pertains to the Etruscan aristocracy. The most salient ones depict private situations, but these assume public value as self-representation of the elites in their community. As representative case studies, we can focus on banquets, marriages and funeral scenes – the three most important ceremonies of the Etruscan upper class.

The most ancient representations of musical banquets are on the terracotta reliefs from the Murlo Palace, dating to the first half of the sixth century BCE. Here, a banqueting man reclining on a *klínē* plays the *kithára*. Banqueters playing musical instruments also appear, nearly a century later, on a few painted tombs in Tarquinia and Chiusi, black-figure vases and on some cinerary urns from Chiusi (Fig. 1). In these cases, the *lýra* is most commonly depicted. The *lýra* was normally used to accompany the voice. Banqueters singing to its music are common in representations of Greek banquets, young Greek aristocrats normally receiving musical education. Here, we are dealing with Etruscan noblemen brought up in the Greek manner, who are singing a set piece to their companions. Such a combination of Greek and Etruscan education was probably common in the Etruscan upper class, and so we should not be all too surprised to find precious ivory plectra in rich

tombs of the Etruscan Orientalizing period in the seventh century BCE. These, as much as the sumptuous banquet implements found in the same tombs, are proof of the Hellenization of the deceased. In some Tarquinian tombs, *lýres* are depicted hanging on the walls. On one occasion, we find one in the centre of the back wall of the chamber, and beside it a man gesturing a farewell. This is a prominent place where we sometimes find people in the same state of farewell on the sides of a false door as a symbol of the departure of the deceased. Two *cippi* from Chiusi, in contrast, display banqueters men playing the *aulós*, which was also prominent in Greek city states, not least in southern Italy. It is very unlikely, on the contrary, that the two men with *litui* depicted above the inner door of the *Tomba del Pozzo* at Chiusi are banqueters. If it is not a copyist's fault, this would be the first case of *lituus* players depicted in the significant position above the door, a position they will later occupy in the *Golini I* and *degli Scudi* tombs.

All other musical scenes show musicians standing between the *klínai* of the banqueters rather than partaking in the banquet themselves. These are probably professional musicians or servants entertaining their masters. Most of them are playing the *aulós*, the "national musical instrument" of the Etruscans, often accompanied by a stringed instrument, such as the *lýra* or *kithára*. The musicians are almost all males, but sometimes there are women, playing the *aulós* much more often than a stringed instrument. In some cases two musicians, one with the *aulós*, the other with the *lýra*, are symmetrically positioned at the sides of a *klínē*. This is the first example of a musical duo, an image that will become codified in Late Classical representations, in which the two musicians stand beside the *klínai* of the most important people shown banqueting in the afterlife. In some Tarquinian tombs such a pair is shown playing on either side of a door, either the actual door of the tomb or the false door that is sometimes painted on the back wall, symbolic of the deceased's departure. In another instance, the two musicians are depicted playing at the sides of the niche holding the

cinerary urn. More rarely, they appear beside a large krater, which may simultaneously symbolise the deceased and the salvific power of Dionysos. The sounds of lyre and pipes are the unifying element in these depictions, used to celebrate the deceased at the boundary and intersection point between the living and the dead. This schema endured until the Hellenistic period, as seen on an urn on which two musicians are shown playing *aulós* and *kithára* next to the door to Hades, which is guarded by a demon. It is interesting that lyres and pipes were later paired in the performances of the *symphoniaci* who played at Late Republican Roman funerals.

The same instruments also accompany the banqueters during the *kômos*, the orgiastic dance that follows the symposium (Fig. 2), although here the *aulós* may also appear alone. Sometimes there is also a female dancer playing *krótala*.

Some images on sarcophagi and urns are explained as scenes of marriage. From the last decades of fifth century BCE, Etruscan art often refers to death, showing the journey of the deceased to the underworld, escorted by real or supernatural attendants. For the male deceased, this journey gradually becomes a ceremonial procession which portrays him as a magistrate (*processus magistratualis*). For aristocratic women, the journey is often reminiscent of a nuptial cortege.

The sarcophagus of Ramtha Visnai (Fig. 3) (now in Boston), perhaps made to contain two deceased spouses, depicts, at the centre of the chest, the nuptial handshake (*dextrarum iunctio*) between a man and a woman. Each has a cortege reflecting the spouse's gender and rank. The bride is followed by servants carrying

objects belonging to the feminine realm and by a female lyre player. For the groom, the cortege is a *processus magistratualis*, with attendants carrying a *lituus* and a *cornu*; a female figure with an *aulós* follows, wearing a strap (*phorbeia*) that helps sustaining air pressure inside the mouth. On another sarcophagus from Caere – intended for a single male – a married couple is preceded by a single procession, led by two men carrying a *cornu* and a *lituus* as tokens of distinction, without playing them. A man who is singing or speaking follows, turning back toward two musicians who are playing the lyre and the doublepipe.

Representations which appear to be images of daily life can conceal symbolical references to death. Direct representations of death, in contrast, are very rare in Etruscan art. Among the few exceptions are some funerary reliefs from Chiusi that depict the *próthesis*, the exposure of the deceased's body for public mourning (Fig. 4). Music is indicated only in a few cases, always played on the *aulós*. The performance was probably extensive as the pipers are playing their instruments with help of the *phorbeia*. An instrument with two pipes of different lengths leads an exceptional scene of *ekphorá*, the transportation of the dead. The few scenes of *próthesis* depicted in Tarquinian painted tombs or on Etruscan black-figure vases however do not include musical iconography.

While it is possible to identify some recurrent themes, there remains much variation in Etruscan depictions of musical scenes, making it difficult to draw a consistent picture of music in Etruscan life – all that we get are glimpses into a few aspects of a the rich musical reality of Etruria.



Fig. 1 Stone relief from Chiusi. Chiusi, National Archaeological Museum.



Fig. 2 *Tomba dei Leopardi*, right wall. Monterozzi necropolis, Tarquinia, Italy.



Fig. 3 Sarcophagus from Vulci, Necropolis of Ponte Rotto. Boston, Museum of Fine Arts.



Fig. 4 *Cippus* from Chiusi. Rome, Barracco Museum.

3.8 Music in Etruscan and Roman Rituals

Chiara Bernardini

Romans often considered the Etruscans to be the most religious people and the best in performing rites, in which music had an important role.

The *lituus*, for example, a long brass instrument with an up-curved bell, had always been an instrument of the ritual expression of royal leadership in both the religious and the military spheres, which were still closely linked in the early Etruscan time. Such an instrument was discovered in a votive deposit in the *Pian di Civita* in Tarquinia. This had been given a different ritual function, no longer being playable as a musical instrument. It had been bent and deposited, together with a shield and an axe, all being dated to the end of the eighth or the beginning of the seventh century BCE. Another *lituus* was found similarly bent and lying near a sacred space in the necropolis of Sodo in Cortona, this being dated to a century or so later.

The music used in the sacred services and sacrifices in Etruria is found described in Latin literature. There we read that doublepipes (*aulós*, lat. *tibia*) as well as lyres (*kithára*) were played during the rites performed at the altar, while the powerful straight trumpet (*tuba*) announced the arrival of the procession to the place of sacrifice. Interestingly, sacrificial music is not mentioned in the surviving Etruscan texts on rites, the *Liber Linteus* and the *Tabula Capuana*; but the iconographic sources confirm the presence of *aulós*, *kithára* and *lituus*.

The *aulós* appears in scenes of libation and animal sacrifice from the Archaic period through to the Hellenistic age in Etruria. The most complete reproduction of a sacrificial procession that we have appears on bronze sheets from Bomarzo. In this depiction from the beginning of the fifth century BCE the piper, positioned close to the altar, plays at the moment just before the animal's throat is cut – obviously not providing a mere accompaniment, but an essential part of the ritual act itself. On votive terracottas from the Vignaccia sanctuary in Cerveteri from the fourth century BCE, the musician – a piper, sometimes accompanied by a lyre player – features among

the few selected elements chosen to represent the rite, together with the priest or deity libating at the altar and, sometimes, sacrificial victims (Fig. 1).

Music also had a significant role in civic rituals, such as weddings, magisterial processions and funerals (Fig. 2). A doublepiper leads a nuptial procession on a *cippus* from Chiusi (early fifth century BCE). In the wedding parade represented on a sarcophagus from Vulci (370-360 BCE), the husband is followed by men carrying the chair of the magistrate and brass instruments (*lituus* and *cornu*) as well as a female figure with an *aulós*. The bride is followed by servants carrying an umbrella, a casket, a fan and a vessel as well as a female *kithára* player. On a sarcophagus from Cerveteri (350-300 BCE), the wedding parade includes a *cornu* player (*cornicen*), a figure with a *lituus*, a probable singer, a *kithára* and an *aulós* player, the bride, the groom and the chariot of the magistrate. As on the sarcophagus from Vulci, the *aulós-kithára* pair is flanked by brass instruments, which once more function as male status symbols, celebrating the social position of the deceased.

In funerary contexts, music soothed the mourning, comforted the relatives and marked the locations of the funerals – compare pipers playing at the foot of the funerary bed, flanked by mourners, on depictions from the early fifth century BCE. *Aulós* and *kithára* also appear associated with the passage to the underworld in Tarquinian painted tombs from the late Archaic period to the late Classical age, depicted on either side of the door to the hereafter, playing near vessels that served in aristocratic banquets but also as cinerary urns (Fig. 3), or, on a Hellenistic urn, flanking the infernal door. In contrast to the brass instruments, the *aulós* appears more associated with females in these rites-of-passage contexts.

Aulós players (*tibicines*) from Etruria occupied a key and fixed role in Roman sacrifices and public prayers. The music obscured every distracting noise, and if it stopped, the rite was compromised. The musicians were organised in *collegia tibicinum*, well known from inscriptions. Being indispensable for the communication

between the gods and the city, the guild held a privileged position in society and maintained a close relationship with the centralized government.

In Imperial times, doublepipers are part of codified and official imagery accompanying the Emperor libating at the altar as a mark of his *pietas*, as shown on several *arae compitales* (crossroads' altars) from Rome and other parts of the Empire, in the first and second century CE, on coins issued by Domitianus as well as Trajan's Column and the Capitoline Relief, on which Marcus Aurelius is shown performing a sacrifice. This practice is continued on the so-called Decennalia Base (303 CE), which commemorated the tenth anniversary of the Roman Tetrarchy.

Brass instruments also had an indispensable role in the public parades, including religious processions. Notably, the rite of the *tubilustrium*, the purification of the sacred trumpets, which marked the beginning of the annual season of war. The brass also guides the parade in scenes of purification of the army (*Iustratio exercitus*)

on Trajan's Column and in Marcus Aurelius' Relief on the Arch of Constantine. When related to animal sacrifice, the *tuba* leads the sacrifice processions, as on the Base of the *vicomagistri* (approximately 30-50 CE), the holy magistrates established by Augustus, or play together with a doublepipe, as on the monument of Marcus Aurelius and Lucius Verus from Ephesus, depicting the sacrifice of a bull.

Just as in Etruscan and Greek societies, doublepipes also had an important role in many private contexts, such as weddings, where the bearers of wedding torches led the procession to the husband's house together with a piper. At funerals, the music of the doublepipes had become so much of a status symbol that their number was limited to ten by the Law of the Twelve Tables. Together with the brass, these instruments kept the tempo in the aristocratic funerary parade; compare a relief from Amiternum (second half of the first century BCE; Fig. 4) with a *lituus* (very rare in Rome), two *cornua* and four *tibiae*.



Fig. 1 Votive terracotta from Cerveteri. Boston, Museum of Fine Arts.

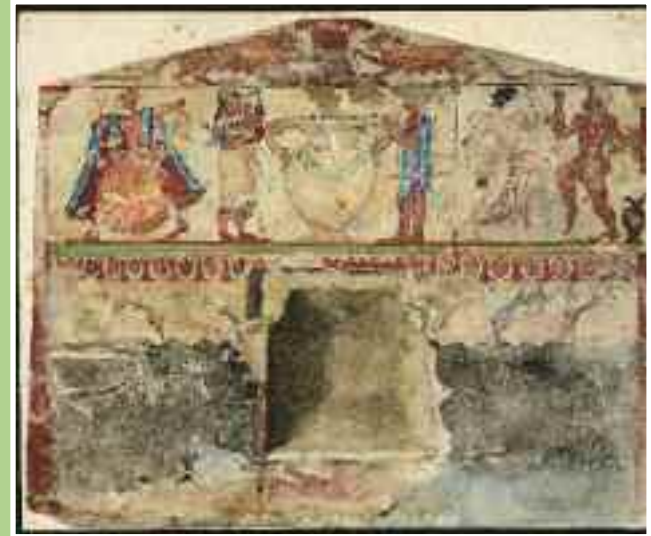


Fig. 3 Tomba delle Leonesse.
Monterozzi necropolis, Tarquinia, Italy.



Fig. 4 Funerary relief from Amiternum.
L'Aquila, National Museum of Abruzzo.

Fig. 2 *Cippus* from Chiusi. Rome, Barracco Museum.

3.9 Bleeding for the Mother. Music in the Phrygian Cult

Carlo Pavolini

The *Magna Mater deum* (Great Mother of the Gods), today better known under the name of Cybele, was an extremely ancient deity of Phrygia, the region at the centre of the Anatolian peninsula in the western part of present-day Turkey. Her cult dates back at least to the end of the second and the beginning of the first millennium BCE and was associated with that of her lover, the young shepherd Attis. According to myth, Attis, after a series of complicated events, emasculated himself and died out of remorse for having betrayed Cybele; the latter mourned his death and finally obtained his resurrection after three days. As in other eastern pagan religions, the death and rebirth of the god were connected with the regeneration of nature in early spring. In Rome, for example, the festivals of Attis and Cybele were held between the end of March and early April, and the key points of the ceremonies were marked by ecstatic expressions of pain or joy by the priests and worshippers. The modern term used to describe the sacred context of these bloody events is “metroac” (“of the Mother”).

The cult image of Cybele was brought to Rome from Pessinus, her Anatolian sanctuary, in 204 BCE. The goddess, with her large temple on the Palatine in Rome, immediately became central to Roman religion, protecting the state and the army. The god Attis, by contrast, though loved by the people, was initially not given full official status because the Roman Senate was hostile to the more bloody and orgiastic features of his cult. It was only with the emperor Claudius (41-54 CE) that the worship of Attis was legitimized in Rome. Claudius also enacted a more general “reform” of Phrygian rites, which from this period onwards became extremely widespread, especially in Italy and the western provinces of the Roman Empire both in Europe and North Africa. Two categories of musical instruments accompanied the ceremonies in honour of these Anatolian deities: percussion and wind instruments. The sources providing information on their use are almost exclusively

texts and representations in art, such as reliefs, statuettes, murals and vase paintings.

Percussion instruments included drums (*tympana*), made of leather stretched inside a circle of wood or bronze, and cymbals (*cymbala*), two bronze hemispheres always used in pairs by striking them against one another. A constant feature is the depiction of Cybele holding a frame drum – her main attribute – and she is usually shown accompanied by lions. However, the goddess is rarely shown actually playing a frame drum or other related instruments, like cymbals. Common, on the other hand, are images of other divine figures in her circle (especially Attis), or of people active in her cult, represented as they play instruments associated with the goddess. Aside from the figures depicted in art works, however, physical examples of these and other musical instruments associated with the cult of the goddess seem to have completely disappeared. The sole exception seems to be a bronze cymbal found in a cave near the church of Notre Dame in Grozon, France (Fig. 1a-b), which bears an inscription with pierced lettering, separated by ivy leaves: *Matri deum Camellius Tutor ex voto* (“Votive gift of *Camellius Tutor* to the Mother of the Gods”).

The wind instruments used at the festivals of Cybele and Attis were doublepipes, *tibiae*. The instrument employed most commonly was the so-called *tibia Phrygia*, which derived from the same region as Cybele herself. The material used for these instrument was wood, or, in the case of valuable examples, brass, bronze, silver, bone or ivory.

It is easy to imagine the agitation caused by the combined use of all these instruments in the festivals of Cybele, in part because we are helped by the literary sources: the poets describe the music as wild and barbaric, and vivid descriptions relate the effect – similar to a low roll of thunder – produced by the drums, the metallic clashing of the cymbals and the “hoarse” (*raucus*), quavering and

deafening sound of the *tibiae*. This combination of timbres must have been well suited to the ceremonies related to the death of the god Attis, when it was necessary to produce among the worshippers a particularly gloomy and mournful mood. Nor is it surprising that this music produced the orgiastic frenzies during which the Cybele priests (known as *Galli*) went so far as to castrate themselves in imitation of the god. Notably the instruments of Phrygian cults did not include brass instruments such as bronze horns or trumpets. Also, it does not seem that panpipes (*syrix*) were ever played during rituals related to Cybele, though they are often represented as an attribute of Attis as he was a shepherd. The sources tell us that the execution of the music accompanying the festivals of *Magna Mater* was entrusted to female *tibia*-players (*tibicinae*) and to the players of frame drums (*tympantistriae*) and cymbals (*cymbalistriae*), who were also exclusively female.

One of the classes of objects on which depictions of musical instruments related to the cult are most frequently found are sacrificial altars with inscriptions dedicated to *Magna Mater* and Attis. Such altars were used in the *taurobolia*, particularly bloody initiation ceremonies in which worshippers had themselves covered with the blood of a bull after its throat was slit. The ritual of the *taurobolium* may have been established by Antoninus Pius (138-161 CE) and was particularly popular in the fourth century CE, when the most influential pagan members of the Senate competed to participate in this kind of initiation. The most famous series of related altars was found in the 17th century near St Peter's in the Vatican, at the former location of the *Phrygianum*, a sanctuary used specifically for the *taurobolia* in Rome. On the reliefs adorning the altars (Fig. 2), alongside the Phrygian gods and the animals to be sacrificed (bull and ram), we often see the sacred pine of Attis, the tree beneath which, according to the myth, the god had died. Many objects, attributes of Attis, appear both hanging from the tree and on their own. Some of these are musical instruments, such as the panpipes or the Phrygian pipe, often being shown with a pair of

cymbals. A second very large group of these altars is documented from the mid-second up to the mid-third centuries CE in the territories of the Roman province Gallia (France) (Fig. 3a-b). Musical instruments (*tibiae*, panpipes, etc.) are also present, but in contrast to those on the altars in Rome, they do not appear hung from the sacred pine.

In the ceremonies for Cybele, a fundamental function of instrumental music was to accompany dancing and singing. There are frequent representations in which Attis (often winged) in particular is shown dancing ecstatically. This is especially true for small terracotta and bronze statuettes (Fig. 4), which were common both in the regions of the eastern Mediterranean (Asia Minor, Greece, Egypt) during the Hellenistic period (third to first centuries BCE) and in the Roman world. The historical and literary sources provide a wealth of information on the songs that accompanied rites in honour of the Phrygian gods, and a few fragments of the poetic texts of these hymns have survived. Often dance and song were combined. The priests (the aforementioned *Galli*), in their mystical trance, accompanied the rhythmic rotation of the head with prophetic ululations. The Christian writers of the fourth and fifth centuries CE described the low-class actors miming the symbolic union of Cybele and Attis, accompanying these theatrical performances with sexually allusive ditties.

The existence in Rome of a number of the so-called *hymnologi* (composers and performers of hymns) connected with the cult of *Magna Mater* is documented by a few funerary inscriptions on grave stones. However, some scholars consider these composers and singers to be freelancers, whose performances could also be used in ceremonies for other gods. In any case, the burial inscription of one of these singers describes him as the “first public *hymnologus* of *Magna Mater* and of Attis”, his activity thus having an official nature. Certain or probable evidence for the existence of singers related to the cult, both male and female, also exists outside Rome. A coin from Cyzicus, located on the southern coast of the Sea of

Marmara, dated to the second century CE, shows what may be a *hymnologus* with a lyre, next to the reclining figure of Attis. The left panel of the front of a sarcophagus from Arles (Fig. 5a) depicts a hydraulic organ with nine pipes next to some common attributes of Cybele and Attis: the panpipes, a bull, ram or lion and the sacred pine. On the right panel (Fig. 5b) we see a lyre on the right and, on the left, a *pandorion* or *pandurium* (the Greek and Latin names for the lute, whose soundbox was a tortoise shell) with its plectrum. This is the only case in which the lyre, the lute and the organ appear in the iconography of the Phrygian gods. The inscription on the front (Fig. 5c) tells us that the sarcophagus, which dates from 180-

250 CE, belongs to *Iulia Tyrrania*, evidently a performer of hymns to these deities whose song was accompanied by the organ, she herself playing the stringed instruments.

In Rome and in the western Mediterranean Cybele and Attis were venerated until the fourth century CE, when those members of the Senatorial aristocracy who had remained faithful to traditional beliefs made devotion to these gods a “mark” of the last pagan resistance to Christianity. The cult was gradually abolished from the end of the fourth century to the first decades of the fifth century CE, with the transition to Christianity as the only authorised religion of the Empire.



Fig. 1a-b Bronze cymbal from Grozon. Paris, Bibliothèque nationale de France.



Fig. 2 Marble altar of *Scipio Orfitus*. Rome, Capitoline Museums.



Fig. 3a-b Roman Altar. Périgueux, Vesunna Gallo-Roman Museum.

Fig. 4 Dancing Attis, bronze statuette from Egypt. Paris, Bibliothèque nationale de France

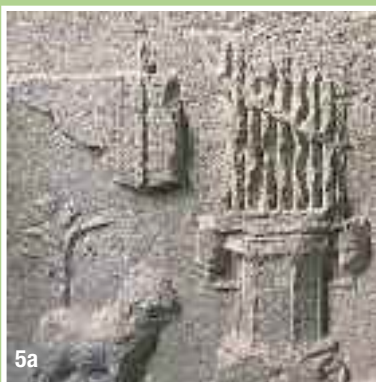


Fig. 5a-c Sarcophagus of *Lulia Tyrrania* from Arles. Musée départemental de l'Arles antique.

3.10 Music in the Games in Etruria and Rome

Chiara Bernardini

Music had an important place in Etruscan daily life, including the games and athletic competitions such as boxing and wrestling, disc and pole throwing, running, jumping and armed dancing (*pyrrhichē*), horse and chariot races. Such games were organized in public or private contexts, as parts of city-feasts or celebrations of the dead, attested by painted vases, by a number of precious painted tombs in Tarquinia and Chiusi and by Chiusinian *cippi* dated from the middle of the seventh century to the first half of the fourth century BCE.

The reed doublepipes, best known by its Greek name *aulós*, was very common in Etruria and was often associated with the games, most prominently with boxing, allegedly the most popular sport according to Aristotle, who reports that the Etruscans boxed to the sound of the *aulós*. In fact, boxing in Etruria, which enjoyed a privileged relationship with music, is frequently represented, from the middle of the seventh century to the middle of the fourth century BCE, and the iconography portraying including a judge, the prize for the competition and the piper, who appears to have played during the entire match. Boxing was apparently seen as rhythmical fighting, with the boxers' movements measured as in a dance (Fig. 1). In the Padanian area, colonised by the Etruscans, the games were also accompanied by music. On two Felsinian *stele* dated to the second half of the fifth century BCE, the boxers are flanked by players of long straight trumpets similar to Greek *sálpinges*. The similarity of the instruments suggests that Etrurian games and musical accompaniment depended to a large degree on Greek athletic traditions.

In Etruria proper we find the *lituus*, the trumpet with a curved bell, associated with the judge and the palm branch presented to the winner. On two late archaic Chiusinian *cippi*, *lituus* players (*liticines*) appear to be connected with the chariot race at the rear, while a small *aulós* player accompanies the wrestling. On another *cippus* three *liticines* are shown flanking athletic acrobatics, and a chariot race is reproduced on the back. Other images from the

Classical period include depictions of the *lituus* likely announcing the beginning or end of a chariot race on an amphora now in Berlin and on paintings in the *Tomba della Scimmia* in Chiusi.

Other athletic games – disc and pole throwing and long and high jumping – were rarely depicted in Etruria and often associated with the *aulós* and dancers with crotals. The competition of armed dancers, similar to the Greek *pyrrhichē*, was however common and also accompanied by the *aulós*. Another *cippus* from about 475-450 BCE (Fig. 2) is decorated with the prize ceremony at the end of the games. A young woman plays the *aulós* near a female dancer with crotals, an armed soldier, and an athlete with a disc and pole awaiting the prize, which is represented by the row of vases below the tribune.

How much sports in Etruria were associated with spectacle is evident from the related depictions of music-making, dancing, acrobats, jugglers and actors. Wrestlers are found flanked by a masked figure called *Phersus*, and at another place a similarly masked actor is dancing to the sound of the *aulós*. In the same way, an amphora painted by the Micali Painter in London (B 64, ca. 500 BCE; Fig. 1) depicts several athletic games, a boy scrambling up a vertical pole, dancers and a piper. *Aulós* players are also depicted accompanying a game in which discs are thrown at candlesticks placed on women's heads (Fig. 3).

Public games were another context in which the significance of music in the life of the Roman city and as a mean of exerting power was evident. Trumpet players drew spectators to the Secular Games (*Iudi saeculares*) organized by Augustus in 17 CE. Also in the Augustan age, the ensemble of *tibia* and *cithara* of the *collegium* of *symphoniaci* of Rome was permitted to perform at public games.

The circus games (*Iudi circenses*) were paid for by magistrates as these games were instruments of political control used to establish a political consensus. A special parade (*pompa*), which resembled the triumphal procession, moved toward the *circus*. It was introduced by trumpets, and a procession of sacred images of

gods was followed by the sounds of *tibiae* and sometimes chordophones as well. Both pipes and chordophones were necessary in the performance of cult rituals and lent a sacred character to the parade.

Literary and iconographic sources attest that the *tuba*, the long straight trumpet, inherited the function of the Etruscan *lituus* during the competitions held inside the *circus*. The *tuba* announced the beginning and ending of the games as well as the bestowal of the prize and was also associated with the palm branch presented to the winner. On a painting in Pompeii, the armed winner of the race is celebrated by a *tuba* player (*tubicen*), and on a later mosaic in Ostia a *tubicen* plays near the table of the prizes amongst the athletes. Another mosaic from the beginning of the fourth century CE depicts the *tubicen* and possibly the attending magistrate with the palm branch next to the central pillar of the Circus Maximus in Rome (Fig. 4). The two figures are awaiting the chariot races. A second *tubicen* is shown accompanying the race with torches. Three *tubicines* are also depicted in a large mosaic from Gafsa, Tunisia, from the same period. They are displayed accompanying a variety of activities at the athletic games: jumping, the proclamation of winners, and probably the bestowal of the prize.

Brass instruments had important roles also in the gladiator fights. The *cornu* accompanied the parade, *tubae* opened the games and called for silence for the proclamation of the final verdict, confirming the symbolic function of trumpets as the voice of the authority. The *tuba* also introduced the attending magistrate that led the *pompa*, as seen on funerary monuments (Fig. 5) dating to the Late Republic-Early Empire. These monuments illustrate how the complex symbolic representation of power developed in Rome was adopted by the provincial leading classes.

On the tomb of *Lusius Storax* in Chieti (30-50 CE), which depicts gladiatorial games paid for by the rich local official, the central tribune of the magistrates is flanked by players of *tubae* and *cornua*

(*tubicines* and *cornicines*). The instruments simultaneously announce the authority of the tribune and mark that of the deceased within the local society.

Due to their volume and their connection with war and death, brass instruments were suitable for organizing fights in the arena as well as for initiating and accompanying processions and games. A very interesting drawing scratched on a tomb in Pompeii in the first century CE depicts a game given in Nola. Two gladiators fight, flanked by *tubicines* on one side and *cornicines* on the other side, just as on the relief on Storax' tomb. Again in Pompeii, a fresco from the amphitheatre depicted a *cornu* associated with the games. In addition, the so-called Gladiators' Relief from the first century BCE depicts two *tubicines* marking the conclusion of the fight and most likely the death of the defeated gladiator.

Fights accompanied by the sound of the water organ (*hydraulis*) are described by Petronius, and the ensemble of two *cornua*, an organ and a *tuba* accompany combats in two depictions of gladiators in a first-century CE mosaic from the Roman villa in Zliten in Libya (Fig. 6). A *cornicen* and an organ player are shown in another mosaic (second to third centuries CE) from a Roman villa in Nennig, Germany. This mosaic, depicting games, includes images of musicians dressed in tunics with short sleeves, which are sometimes decorated with two vertical bands, as is the case with the arbitrators of the matches. Although the *tibia*, an instrument necessary in cult ritual, had a fixed position in the procession, it was less often used during the fights. Unless it was a mistake made by the stone-cutter, a funerary inscription from Venafrum recalls the deceased's role as a *tibicen* (not the expected *tubicen*), who marked the changes between fights and incited the gladiators. It is indeed the *tibia*, however, that was associated with gladiator combats and hunts in Central Europe during the first and second centuries CE.

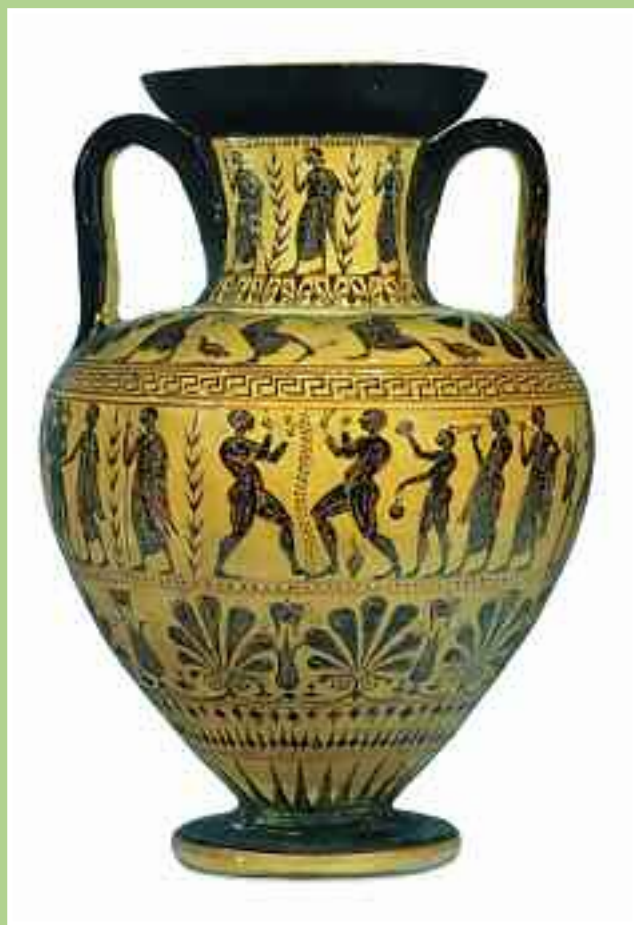


Fig. 1 Etruscan black-figure amphora by the Micali Painter. London, British Museum.



Fig. 2 *Cippus* from Chiusi. Palermo, Regional Archeological Museum "A. Salinas".



Fig. 3 Tomba dei Giocolieri. Tarquinia, Necropolis of Monterozzi.



Fig. 4 Mosaic. Piazza Armerina, Villa del Casale, Palestra.



Fig. 5 Funerary relief from Pompeii. Naples, National Archaeological Museum.



Fig. 6 Mosaic in Roman villa. Zliten (Libya).

3.11 Music for an Empire

Chiara Bernardini

As attested by literary, epigraphic and iconographic sources, music accompanied various moments in public and private life in Rome. Rooted in Greek and Etruscan cultures, music in Rome was fundamental in the development of early Roman society.

The local double-tube reed aerophone, the *tibia*, evolved from the Greek and Etruscan *aulos* to become the harmonic instrument to accompany sacrifices and rites, triumphs and funerals, banquets and performances. The *tibia* was often played alongside chordophones (*lýra*, *kithára* and harp), also with Greek and Etruscan origins. Aerophones without reeds – the *lituus*, *tuba* and *cornu* – similarly came from Etruria and preserved the functions of their predecessors as instruments of power, used in war, in triumphal and funeral processions, in religious rites and games – whenever it was important to pronounce authority.

According to the ancient writers, the sacred rites, the art of divination and the music that accompanied official events were introduced to Rome from Etruria, as were objects that were indicative of power, such as triumphal and magisterial signs, fasces, axes and trumpets (*sálpinges*, in Strab. *Geog.* 5, 2, 2).

The literature and Roman historical reliefs document the main use of the trumpets as marking authority in military contexts. The *aeneatores* (the trumpet players) were part of all armies, playing in battle, military processions and during activities in the camp. They were often associated with the Imperial standards. In military contexts, music had both practical and symbolic functions, marking the beginning and end of battle, inciting the troops, frightening the enemy, announcing the general and celebrating triumph with the *tuba* and *tibia* (Fig. 1).

The significant role assumed by music in Rome is evident in the institution of *collegia* of musicians. These associations of professionals were approved by and associated with the central authority.

Literary and archaeological sources attest the ancient origin and the importance of these groups of *tubicines et cornicines* (*tuba* and

cornu players) and of *tibicines* (*tibia* players), and these last ones were considered as ancient as the legendary first kings of the city. In fact, the professional pipers were indispensable in sacred services and sacrifices (Fig. 2): there is a story of them going into strike at the end of the fourth century BCE, leaving Rome in order to regain certain privileges. Epigraphic evidence about guilds of pipers and lyre players appears in Rome from the Late Republic to the High Empire. They were reorganized and reinforced by Emperor Augustus as further instruments of his religious and moral reform.

On the other hand, the arrival of the sacrificial procession, the *suovetaurilia*, at the altar was often announced by the powerful *tuba*.

According to Livy, professional Etruscan musicians were engaged in Rome to organize the first *ludi scaenici* in 364-363 BCE. These improvised dances accompanied by the sound of the *tibia* attest to the significant role of music in the origin of theatre, in which a solo doublepipe accompanied both the chorus and the arias of tragedies and comedies alike.

With the conquest of Corinth in 146 BCE and the subsequent Hellenization of Rome, music grew in importance in the city's official life. New genres emerged, such as mime and pantomime, with virtuosic performances of musicians. These were characterised by dances about mythological subjects, associated with pipers that simultaneously played the *scabellum*, a wooden rhythmical instrument tied to the foot.

Apart from the omnipresent Greek influence alongside traditional Italic musical forms, the adoption of foreign cults would be one of the ways in which more remote traditions arrived at Rome. This was true for the rites of the Phrygian Great Mother no less than for those of Isis, which were typically accompanied by the sound of the *sistrum* (Fig. 3).

A number of Roman emperors, including Nero, Vespasian, Hadrian, and Carinus, are reported to have developed an interest in solo performance, particularly on chordophones and the water organ. Nero, for instance, is said to have shown more interest in

new technical developments of the organ than in matters of war, much to the dismay of the nobility. There is reason to assume that playing the lyre was widely taught in upper-class *curricula*; this instrument was frequently heard not only in the concert halls but also in private settings, enlivening feasts and banquets and commonly reproduced in frescos decorating the aristocratic *domus* (Fig. 4).

On the other side, the music was important also in the daily urban life, in particular in the gladiator and circensian games, where the trumpets had a symbolic function to announce the authority and a real one in the organization of the games (Fig. 5), because of their powerful sound.



Fig. 1 Relief from honorary monument of Marcus Aurelius: triumph. Rome, Capitoline Museums.

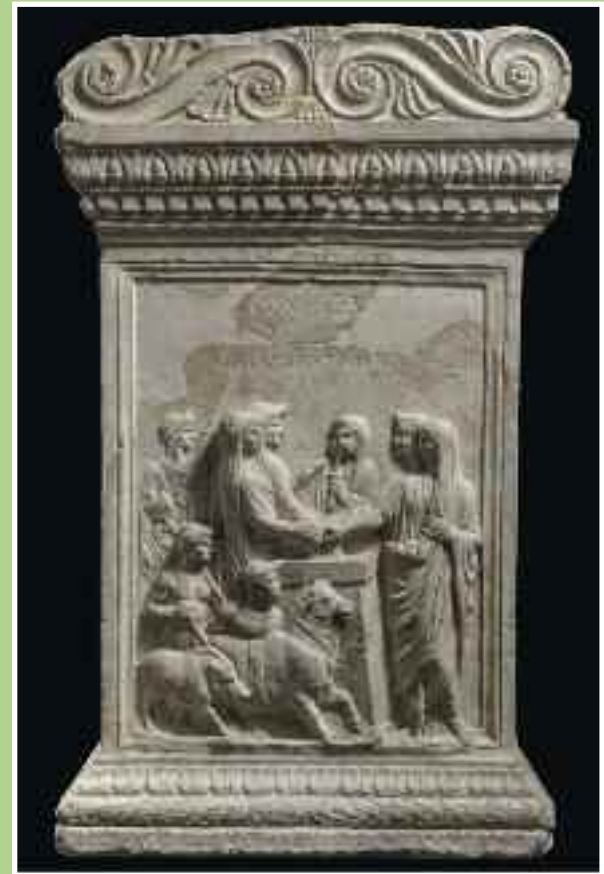


Fig. 2 Ara of Lares Augusti. Rome, Capitoline Museums.



3a



3b

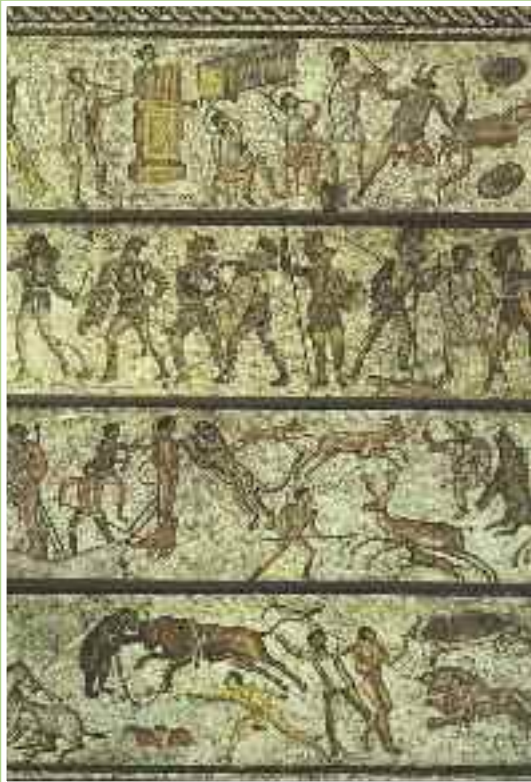
Fig. 3a-b Adrian coin.



Fig. 4 Fresco from Stabia. Naples, National Archaeological Museum.



Fig. 5 Mosaic in Roman villa. Zliten (Libya).



3.12 Pompeii. Music Frozen in the Ashes

Mirco Mungari

The area around Mount Vesuvius, in southern Italy, in which Pompeii and other Roman cities like Herculaneum are located, is without doubt the most interesting archaeological region of the Roman Period. The catastrophic volcanic eruption in 79 CE buried and preserved like frozen images not only the inhabitants and their houses, but also many perishable objects used in their daily life. Furthermore, in the buried Vesuvian cities many aspects of the Roman way of life are accessible. Pompeii, in particular, is a precious laboratory for the reconstruction of ancient soundscapes – combination of sounds that forms within or arises from an environment – as only very few archaeological places in the world provide a comparable opportunity to study the physical reality of many houses as well as public spaces such as streets, squares, theatres, and even an amphitheatre, all within their original contexts. Similarly, one may study the relationships between musical findings, representations of musical instruments and situations, and private and public spaces within which it was intended to make and to listen to music.

Among the musical evidence proper, Pompeii has the greatest number of finds of *tibiae* in the world, both complete and fragmented. These doublepipes consisted of bronze, silver, bone and ivory parts and must have been very popular. The catalogue of the Archaeological Museum of Naples holds more than sixty entries of *tibiae* found in Pompeii and the surrounding area, the largest group of nine complete pipes having been discovered at a rural estate. Other musical instruments and sound-makers of interest are horns (*cornua*), rattles (*sistra*), cymbals (*cymbala*), bells (*tintinnabula*), a gong made from bronze, a shell trumpet and ceramic rattles, some of which will be mentioned below.

So far, there are no certain traces of findings related to wooden string instruments in the Vesuvian area. Perishable materials such as wood, leather and gut strings were all destroyed during the eruption. Only a few fragments of bone and ivory might have been formed part of stringed instruments, but their interpretation as bridges of instruments or plectra is doubtful. On the other hand,

there is a great mass of unpublished and unstudied finds from Herculaneum – including some wooden and organic fragments. So far scholars have not had access to these collections, so they may be some surprises in store.

But musical finds are not the only treasure that the Vesuvian area has to offer to music archaeology. As said before, Pompeii is a unique laboratory for the study of ancient soundscapes, for which the city holds various clues. Most evident are the representations of musical instruments and music-related activities in wall paintings, reliefs and mosaics. These elements are scattered among different decorative contexts (figurative panels in private rooms, friezes, floor mosaics, public monuments), sometimes precise representations of contemporary music-marking, sometimes perhaps fanciful attributes of gods or fantastic beings. A depiction may also suggest or recall a musical activity or atmosphere. For example, *tibiae* are typically depicted in theatrical scenes, as in the famous mosaic from the “House of the Tragic Poet”, which represents an actors’ rehearsal (Fig. 1). In this example, a *tibia* player (*tibicen*) tunes the instrument or practices passages for an upcoming show amongst the actors, who are wearing their costumes and masks. Such depictions suggest a characteristic soundscape and typical ways that the *tibiae* were used in professional contexts. It is remarkable that in Pompeii two beautiful theatres are perfectly preserved: the so-called Large Theatre, intended for drama, and the Small Theatre, properly termed an *odeion*, a smaller building designed for musical performances. These structures, which are even today used for concerts and other events, give us a precise idea of the spaces in which music and drama took place, with their resonances, distances, and other acoustic aspects. Another typical use of the *tibia* was in the ritual of animal sacrifices, which were regulated by strict rules, the non-observance of even one of which would have made the rite invalid. Accordingly, particular attention was paid to the soundscape of the event. In fact, all the representations of sacrifices show a *tibicen*

playing during the rite. The sound of *tibiae*, in other words, was an essential part of the rite itself. It accompanied the procession of ministers, children attendants (*camilli*) and other people as well as the sacrificial animals toward the altar. The *tibicen* then stopped playing during the killing of the animal (this action had to happen in total silence) and recommenced for the conclusion of the rite. The Vesuvian area has yielded several representations of sacrificial scenes on wall paintings and in sculpture. Furthermore, in Pompeii and Herculaneum it is possible to examine the places in which sacrifices took place (altars, temples, public squares) and to have a direct experience of the places shown in the depictions (Fig. 2).

Several beautiful Vesuvian wall paintings include depictions of musical contexts. A fresco from a luxurious *villa* in Boscoreale near Pompeii, for example, shows a fair, elegant woman sitting on a precious chair and playing a *cithara*, while a young girl (probably a maid) is listening behind her (Fig. 3). A completely different scene is represented in a small mosaic found once more in a rural estate in the surroundings of Pompeii (Fig. 4). In this vivid image two male musicians, probably on a stage or along a street, are playing a big *tympanon* (frame drum) and a couple of *cymbala* (bronze cymbals). Behind them, a woman wearing a theatrical mask blows into a *tibia*, while a child watches and listens. This small ensemble gives us a brilliant representation of a rhythmic, exciting musical performance. A beautiful fresco from Herculaneum (Fig. 5) shows the centaur Chiron teaching music to young Achilles on the *lyra*. In this depiction a mythological scene reproduces a real situation with great veracity: the hand of the young disciple stopping the strings of the instrument, his intent gaze and the majestic gesture of the master allow us to imagine real music lessons of the first century of our era.

The amphitheatre of Pompeii, one of the most ancient from the Roman world, gives us a beautiful and perfect location to imagine the volume of the shouting crowd during a gladiator fight, woven with the loud sounds of *cornua* and *tubae* (bronze brass instruments) as well as the sound of the *hydraulis* (water organ),

which was used to attract the audience and articulate the spectacles. A beautiful pair of bronze *cornua* was indeed found in Pompeii, but precise information about the finding context is unfortunately lost. (Fig. 6).

But there was also the everyday soundscape of the street – the voice of the town itself. It is fascinating to imagine the sounds of chariots laden with jingling *tintinnabula* (little bells used as luck charms) (Fig. 7), sellers screaming, children shouting and craftsmen working while having a walk along the larger streets. At the opposite end of the spectrum, the rows of the great and solemn doors of the patrician houses would offer glimpses into these secret, silent domestic spaces. It was common to find bronze *tintinnabula* near the front doors of houses and shops and hung in front of and inside *cauponae* (taverns) and other public places to attract people as well as to repel bad luck.

The large number of *sistra* and pairs of metallic cymbals found in the region would have been employed in precise musical contexts associated respectively with the cult of Dionysus (cymbals) and the Egyptian goddess Isis (*sistra*), who was venerated in her own temple in Pompeii. The *sistrum* was imported from Egypt and introduced into Roman culture specifically for this ritual use. Thus, it is certain that the *sistra* found in Pompeii (most of them come from the surroundings of the temple of Isis itself) were used by priests during the sacred ceremonies in the temple of Isis. Another sound-tool with a precise meaning was the *discus*. Several examples come from public baths (*thermae*) both in Pompeii and Herculaneum. The *discus* is a small gong, which was suspended by a metallic ring and beaten with a metallic stick usually connected to the instrument with a chain. Its clear sound was the signal for shift-changing and closing time in the baths, and would have penetrated the large and crowded rooms easily.

The Vesuvian cities are a precious laboratory for the study of ancient sounds and music. With a diverse approach, making use of several kinds of sources and information, it is possible to have a rich – though far from complete – sense of the musical culture of the Romans in the first century CE.



Fig. 1 Actors' rehearsal, mosaic from Pompeii, Casa del Poeta Tragico. Naples, National Archaeological Museum.



Fig. 2 Relief, public sacrifice. Pompeii, Temple of Vespasian.



Fig. 3 *Kithára* player, wall-painting from Boscoreale, Villa of P. Fannius Synistor. New York, Metropolitan Museum of Arts.



Fig. 4 Street musicians (devoted of Cybele), mosaic by Dioskourides of Samos from Pompeii, Villa di Cicerone. Naples, National Archaeological Museum.



Fig. 5 Achilles and Chiron, wall-painting from the Basilica of Herculaneum. Naples, National Archaeological Museum.



Fig. 6 *ornu* from Pompeii. Naples, National Archaeological Museum.



Fig. 7 Phallic tintinnabulum from Herculaneum. Naples, National Archaeological Museum





After the Romans

4.1 The Musical Viking

Cajsa S. Lund

The Viking Age, from the late 700s to about 1100 CE, is the last period of the Nordic Prehistory, seen from a general Nordic archaeological perspective. A popular conception of Vikings is that they were mainly shipbuilders, mariners, explorers, traders, warriors, raiders and plunderers. In fact, they were primarily farmers; their economy was based upon agriculture and animal husbandry. The Norse men who went off raiding or trading, travelled worldwide, as we know, facilitated by their advanced seafaring skills and characteristic longships. The Danes went to the east of England, to France, Spain and the Mediterranean sea while the Norwegians went to Scotland, Ireland, Orkney and Shetland Islands and on to Iceland, Greenland and North America. Swedes went to Russia, down the Russian rivers to the Caspian sea and the Black sea all the way to Baghdad. In Central Asia they came into contact with the trade caravans from China. Vikings eventually became permanent residents on Iceland, Greenland, in England and in French Normandy, which still bears their name. The Viking People lived in an open world and participated in large international economic networks. Cultural ideas were adopted from and exchanged with foreign countries.

Our knowledge of music in the Viking Age, and, indeed, in Nordic Prehistory in general, is primarily based on archaeological finds of musical instruments and other sound tools, either intact or in fragmented form. There are several hundreds of such finds recovered from the Nordic countries proper and from documented Nordic settlements in other areas, such as York in England. Rattle instruments, wind instruments and stringed instruments are all represented – but never drums, although we must assume that these were in common use at the time. Another source of information, though limited, consists of preserved contemporary iconographic material, such as images of musical instruments. However, from the Nordic countries the only relevant iconographic finds are those occasional and hard-to-interpret motifs on so-called picture stones and runic stones. Instruments which have been

identified include a bell, and a possible harp. In addition, sporadic mention has been made of singing, playing and other sound production in early written medieval sources related to the Viking Age, for instance passages in the oldest Nordic poetry and sagas and a number of non-Scandinavian texts, including contemporary Arabic texts. One example of the latter are notes by the Arab traveller and merchant Ibrāhīm ibn Ya‘qūb at-Ṭartūšī, when visiting the Danish trade-centre Hedeby (Haithabu) ca. 950 CE. He writes: “Never before I have heard uglier songs than those of the Vikings in Denmark. The growling sound coming from their throats reminds me of dogs howling, only more untamed”. One may wonder what songs and what vocal style he happened to hear?

The bulk of the music-archaeological finds are various *rattle instruments*, such as pellet bells of iron and of bronze (Fig. 1), rattling body adornments, and rattles for horse-drawn vehicles. There are also many finds of iron bells designed for specific purposes such as cow bells. Pellet bells were used both on horse equipment and on clothes, especially in Finland. An odd variant of iron rattles is the Norwegian *rangle* (plural, *rangler*) (Fig. 2). Evidence suggests that they were fitted to the ends of ropes, for instance the traces, of cultic horse-drawn vehicles. A large group of iron rattles, probably used in connection with horse riding, was also found in Finland.

Among the finds of *wind instruments* – including buzz bones – are flute instruments of bone, cow horns with finger holes, a panflute of wood, chanters of wood for reed instruments and a wooden trumpet, a *lur*, length 106 cm, found in the Viking ship grave Oseberg, Norway (Figs. 3-4). *Buzz bones* (Figs. 5-6) still exist today, but exclusively as toys, the most common type of buzzer being created from a button on a sewing thread. According to both ethnological records and early written sources buzz bones once had, in addition to their function as toys, a certain role in popular belief. Stories in the Nordic countries tell of buzz bones being used to frighten away small trolls.

Chanters for reed instruments, carved from elder tree, have been found in Denmark (five finger holes) and in Sweden (four finger holes), see Fig. 7. They are dated to ca. 1050 CE or somewhat later. A wooden chanter was also found in York. Without doubt, these chanters were parts of hornpipes and/or bagpipes. A reasonable assumption is that bagpipes/hornpipes were used for dance music in various feasts and ceremonies in the villages and marketplaces and they may also have been manufactured and played by shepherds to entertain themselves as well as their flocks.

A bone flute (block-and-duct flute type) with two finger holes was found in the Viking-Age trade centre Birka in Sweden (Fig. 8). It may have belonged to a shepherd who played for his flock, or a

trader who made music to attract customers. Or was it rather intended to frighten off wolves by means of trilling high-pitched sounds? In fact, shepherds in Sweden still used bone flutes for such purposes as late as around 1906. Of course, this Viking flute may just as well have been used by someone wanting to entertain himself and others!

Fragments of *stringed instruments* have been found in the Nordic countries in the form of bridges (Fig. 8) and tuning pegs for lyres and a possible fragment of a rebec. As yet there is no concrete archaeological evidence that harps were utilised in the Norse countries. It is likely that the term “harp”, used so often in written sources, was then the generic term for stringed instruments.



Fig. 1 Pellet bells of iron with strap mountings, used on a harness. Grave find from Raglunda, Västmanland County, Sweden (ca. 1000 CE).



Fig. 2 Iron rattle (*rangle*), found at Vågå in Oppland County, Norway. Oslo, Kulturhistorisk Museum.



Fig. 3 The internal cavity of the Oseberg *lur* is analysed by means of rectoscopy at the Oslo University Hospital, a project initiated in 1983 by Cajsa S. Lund.



Fig. 4 A replica of the Oseberg *lur*, made and played by Ake Egevad.



Fig. 5 Traditional buzz bone made from a pig's metapodial.

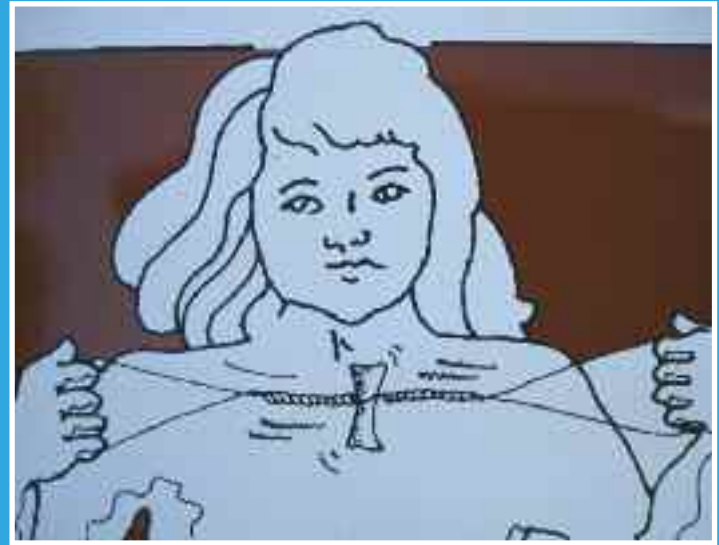


Fig. 6 Buzz bone in function. Drawing by Lars Bolander.



Fig. 7 The Lund pipe. Chanter of a hornpipe or bagpipe, found in Lund, Sweden, carved from local elder tree (dated to 1050 CE or somewhat later).



Fig. 8 A block-and-duct flute with two finger holes (made of bone from a roe deer), and a lyre bridge (made of antler from an elk). Both were found in the same cultural layer in the Viking trade center Birka, Sweden and are dated to ca. 800-900 CE. Stockholm, Statens Historiska Museum.

4.2 Music and Sounds in Viking Funerals

Cajsa S. Lund

Instrumental and vocal sound production, possibly even dance, were probably common features of people's funeral rites in the Viking period but there is not much concrete evidence for that. Two sources that offer clues to such sounding activities are the archaeological find of the Viking ship grave at Oseberg in southeastern Norway, and the written report by Aḥmad ibn Faḍlān, the Arab who witnessed a ship burial on the Volga shore in the year 922. Both sources are remarkable, spectacular and concern people of high rank in society.

The Oseberg ship was found in 1903 in a large mound, ca. 40 meters in diameter, and was excavated the following year. The ship itself is about 21 meters long and 5 meters wide (Fig. 1). Analyses have shown that it was built in 820. A great number of everyday items and artefacts were found during the excavations and also many unique objects, such as a richly carved four-wheel wooden cart, bed posts, animal head posts (Fig. 2), sleighs, and a series of textiles, among them tapestries.

Five splendid iron rattles were found, too, in Norwegian called *rangler* (singular, a *rangle*), see Fig. 3. And one of the preserved wooden chests contained a wooden trumpet, a *lur*, 106 cm long (Fig. 4), and also a staff that has been interpreted as belonging to a *völva*. The *lur* might have served as a practical and/or ceremonial signal instrument on board – and/or may have played a role in the funeral rites. A *völva* is a shamanic seeress in Norse paganism. In Viking society, a *völva* was a woman who had immense authority. The Old Norse word *vǫlva* means “wand carrier” or “carrier of a magic staff”. The *völva* practiced *seiðr*, *spá* and *galdr*, which encompassed shamanism, sorcery, prophecy and other forms of indigenous magic (Fig. 5).

The timbered burial chamber on the Oseberg ship's deck contained the skeletons of two women, one younger and the other older. The opulence of the burial rite and the grave goods indicate that this was a burial of very high status. It has been suggested that the older woman was Queen Åsa. Another hypothesis is that she

may rather have been a *völva*.

Analyses of the mound's position in the landscape indicate that it constituted a stage, somewhat like an amphitheatre. Renewed examinations of the excavated material as well as the excavator's drawings have shown that for a period of time the grave with the ship had stood half open during the burial ceremony. This formed a magnificent cult scene – and a bloody one, leaving skeleton remains of many ritually slaughtered horses. The typography enabled many persons to watch and/or to participate in the ritual performances (Fig. 6). Researchers have come to believe that the grave goods most likely were included in the burial ceremony as ritual properties and may have been laid in the grave in the order in which they were used in the ceremony. To summarize briefly: the start of the Oseberg burial was obviously a ritual meal. One of the next steps was to timber the burial chamber as such. Then the forward part of the ship was furnished with the ship's equipment and communicative artefacts, such as sleighs, the magnificent wagon and an animal head post with a *rangle*. About 250 *rangler* dated the Viking Age have been found thus far in Scandinavia, most of them in Norway and in richly equipped graves. Such iron rattles were obviously reserved for people of rank in society. They are interpreted as sonorous signs of dignity but also as apotropaic sound tools, supposed to have been fitted on ropes on horse-drawn vehicles. One recent hypothesis is that the Oseberg animal head posts and the *rangler* were used on sleighs by which the deceased persons were carried.

Perhaps the *rangler* had a relation to the cult of Frö, the male fertility god of the Viking Age. Since stallions were sacrificed to him, the fifteen or more horses slaughtered at the Oseberg burial might be related to a Frö cult.

Even the five wooden animal head posts are supposed to be cultic tools. There is a complicated passage from the Icelandic Edda, which philologists have interpreted like this: “The Vikings decorated animals that they were going to sacrifice to the god Frö with rattles”.

Indeed in Sweden and in Norway there was an old traditional erotic wedding dance, called the *Stabbdansen* and performed up to the early 20th century, in which the participants decorated a symbolic animal made of wood with rattles. Might this possibly be a reminiscence of an ancient Frö ritual?

The Arab ambassador Aḥmad ibn Faḍlān witnessed a ship burial at the city of Bulgar on the Volga shore in 922 (Fig. 7). The burial took place among the Rus people (*Rusiyyah*), who probably were – although this is debated – Norse Vikings who had once come to Bulgar to sell female slaves and fur. Faḍlān wrote an account (*risāla*) in which he describes, among other things, the funeral ceremony, which took ten days. As for the Oseberg burial, it must have taken much longer, probably a number of months, possibly even years.

The extended burial process at the Volga can be divided into many stages – as can the Oseberg burial. To begin with, the dead man was placed in an earth grave for ten days together with a stringed instrument, fruit and an alcoholic beverage (beer?). Meanwhile, preparations proceeded until the day when the dead chieftain finally was taken from his grave and cremated in a ship together with a slave girl, who had to be raped and killed before the cremation took place.

Why was the instrument put in the grave? Was it to keep the chieftain in a good mood with food, drink and a musical instrument during his long stay under the soil? Was he himself a musician as well, or did the instrument accompany him irrespective of his

possible interest in it or his playing skills? At any rate, nothing in Faḍlān's account indicates whether the stringed instrument was also retrieved from the earth grave and placed into the ship where the chieftain and the slave girl were finally cremated.

There was a sound of music in the burial rite. Faḍlān's report mentions three examples of actual sound production. One is the *singing* of the slave girl who is to be cremated together with the chieftain. She sings and drinks each day in this period. Faḍlān does not comment any further on the music. However, another contemporary Arab traveller, Ibrāhīm ibn Ya'qūb aṭ-Ṭartūšī, who visited Hedeby in Scandinavia in the 900s (see the map in Fig. 7), found the local singing to be more bestial than the howling of dogs.

Furthermore, Faḍlān describes men producing loud *sounds by banging their shields with wooden sticks*. This took place right before the slave girl was killed. Faḍlān explains that the banging sounds were meant to obliterate her screams. It is, however, possible that Faḍlān misunderstood the ritual function of these sounds – for instance, they might have been produced in order to keep the dead from returning. This would be in line with the function of church bells in North-European popular belief, or of rifle fire over a dead soldier's grave.

Finally, Faḍlān reports that people involved in the burial ceremonies “played musical instruments”, unfortunately without specifying these. Was Faḍlān not much interested in them – or did he avoid going into a lengthy description of instruments he had no Arabic words for?



Fig. 1 The Oseberg Viking grave ship, Norway.



Fig. 2 One of the five animal head posts.



Fig. 3 Iron rattle (*rangle*) from the Oseberg ship. Oslo, Kulturhistorisk Museum.



Fig. 4 Reconstruction by Åke Egevad of the wooden trumpet instrument (*a lur*), found in the timbered chamber on the Oseberg ship. Photo by Jens Egevad.



Fig. 5 Depiction of a *völva* on a Faroese stamp by Anker Eli Petersen (2003).



Fig. 6 A moonlit reconstruction of the Oseberg ship burial by Anders Kvåle Rue.



Fig. 7 A mad ibn Aḥmad ibn Faḍlān witnessed in 922 a ship burial at Bulgar on the Volga shore.

4.3 Lyres and Bards in the Middle Ages

Nancy Thym

TV, video, smart phone, laptop, computer games – we can hardly imagine life without them today. But in the Middle Ages there were no electronic devices to keep people entertained. There were few or no books and most people could not even read. Life was far from boring, however. It was filled with hard work, but also with stories, music and dance. There were jugglers, mummers, musicians, and, of course, no court in northern Europe would have been complete without its professional tellers of tales – poets who composed and performed heroic epics and sagas of brave deeds from the past and recounted the exploits of their patrons, the kings or clan chieftains. They performed songs of praise and scathing satire. The stories and songs were committed to memory and passed on through oral tradition, from one poet to the next, from generation to generation. In the absence of books and computers, these poets were the repositories of the history of entire clans and peoples. They were historian, advisor, press secretary and public relations official all in one and nearly as important as the kings themselves.

The Gaelic *bard* and Welsh *bardd* belonged to a complex system of poets, musicians and historians. The Anglo-Saxons of England referred to their poets as *scops*, and in Scandinavia they were called *skalds*. In Russian Novgorod the *skomorokhi* were a class of professional entertainers who played instruments, sang and performed theatre with masks. It is not certain whether the poets recited, sang or declaimed their poems in some other manner, but their performances were often accompanied on the lyre or harp. There were many different terms for stringed instruments in medieval times: *cruit* in Gaelic, *crwth* in Welsh, *hearpa* in Anglo-Saxon, *harpa* in Scandinavia, *rotte* in Germanic, *cithara* (from the Greek *kithára*) in Latin. It is not always clear from the accounts if the instrument in question is a harp or a lyre, but iconography suggests that in most places the instrument was originally a lyre and was replaced by the harp only in the later Middle Ages. One of the earliest descriptions of a *cruit*, for example, comes from the saga *The Battle of Mag Tuired* and describes the deity Dagda's

instrument as *daurdabla* (“oak of two greens”) and *coir-cethar-chuir* (“four-sided music”). This could refer to the four-sided soundbox and the two arms of a lyre but could also designate the four-sided soundbox of a harp plus its pillar and neck. However, the instruments depicted on Irish stone crosses of the eighth to the tenth centuries are most certainly asymmetrical lyres. The harp, on the other hand, appears on Pictish stone crosses in present-day Scotland as early as the eighth century, but does not appear in Irish iconography until the 12th century.

The word *bard* is first mentioned by the Greek historian Diodorus Siculus in the first century BCE in his descriptions of the Gauls. He found them to be arrogant and pompous boasters, saying one thing and meaning another, but he also describes them as quick-witted and eager to learn. He says, “Amongst them there are also composers of songs whom they call Bards. These men sing to the accompaniment of lyre-like instruments, songs that may be either of praise or insulting”. The Roman historian Ammianus Marcellinus (fourth century CE) says of the Gallic bards, “They praised the bravery of famous men in heroic poems, which they sang to the sweet sound of the lyre”. But accounts like this are very rare. For information on the *bards*, *scops* and *skalds* of the early Middle Ages, we have few objective reports written by ethnographers, journalists or historians as we might have today. In societies where history was passed on orally, our knowledge is based on the very sagas the poets composed, so the information is sometimes confusing and contradictory. In Gaelic-speaking areas of the British Isles the poets and historians were called *filid* and were organized into a complex and strict hierarchy with different levels of training. Their schooling lasted from six to twelve years, during which they learned hundreds of sagas by heart as well as how to compose in syllabic verse. There were seven levels of training, the poet-historian with the highest level being called the *ollam*. Officially, an *ollam* held the highest position next to the king, but in reality, a sarcastic song from the hand of an *ollam* could topple a king. The poems of the *filid* were

performed by the *bard*, later called a *reacaire*, to the accompaniment of a *cruitire* – a lyre or harp player (Fig. 1). The *cruitire* were free men of very high standing. They were allowed preferential seating at the king's table, and the Brehon Irish laws allowed them to move about freely, whether they were employed by a chieftain or king or not. It was expected of every *cruitire* that he should be able to play three strains of music: *goltraige* (music for weeping), *geantraige* (music for laughing and dancing) and *suantraige* (music for sleeping). In the Irish saga *The Battle of Mag Tuired*, Dagda's *cruit* is captured by the enemy, the Formorians. When Dagda goes to reclaim it, he calls it by name and it springs from the wall where it is hanging, killing nine Formorians on its way to him. Dagda then calls the music from it: "He played the weeping strain to them and their tearful women wept. He played the laughing strain and the women and children smiled and laughed. He played the sleep strain and the entire company fell asleep. Dagda was then able to escape unhurt from the Formorians, although they had wished to slay him".

The most important heroic epic of the Anglo-Saxon period is the story of Beowulf, composed sometime between the seventh and tenth centuries. The songs of the *scops* and the playing of the *hearpa* are mentioned frequently throughout the poem. One of the things which infuriates the monster Grendel and causes him to rampage in Hrothgar's hall is the ringing sound of the *hearpe* and the sweet song of the *scop*: *þær wæs hearpan sweg, swutol sang scopes*. In another passage Beowulf remembers a feast in which an old teller of tales recalled times past or a hero played sweet sounds on the *hearpa* and told tragic tales. The last man of his people, who buries the dragon's treasure, is described as being so alone that he hears no trembling lyre, no "joy-wood": *Næs hearpan wyn, gomen gleo-beames*.

The Icelandic sagas were composed by poets called *skalds*. In the saga of King Sverri, the *skald* Mani (*Skáldmáni*) appears at the court of the Norwegian King Magnus Erlingsson in May 1184. He

performs a poem or song in praise of the king's grandfather. Also present at court are two foreign *leikeri*, or minstrels, who perform on *gígja* and *pípu* (probably a bowed instrument and pipes) with dancing dogs, begging for money. Their performance is so absurd that Máni composes a satirical song on the spot to ridicule them. The king's companions dance around the *leikeri*, repeating the song until the minstrels flee from the king's hall.

The *skomorokhi* of Novgorod in Russia were professional musicians, poets, mummers and clowns who often wore masks during their performances. Archaeological excavations have revealed two main types of plucked stringed instruments in Novgorod. The earliest examples from the 12th and 13th centuries have a playing window like the lyre, and the other type is similar to the *gusli*, which is still played in northern Russia. The 12th-century legend of "Sadko the Singer" tells of a *gusli* player whose playing is so masterful that the King of the Waters helps him become wealthy. Sadly, Sadko forgets the source of his riches, and the displeased King of the Waters causes a storm that forces Sadko to leave his ship and sink to the king's palace under the waves. When the king commands Sadko to play his *gusli*, the king dances so wildly that it causes a storm that threatens all the ships above his palace.

The lyre was not only played by professional musicians, however. King David is often depicted playing the lyre in medieval illustrations, and the lyre was considered to be a royal instrument. Lyres were found in the royal graves of Sutton Hoo and PrITTLEWELL in England. Grave 58 in Trossingen, Germany, (580 CE) contained rich grave goods including horse trappings, weapons, fine textiles, wooden furniture and an elaborately decorated lyre. The nobleman or chieftain was buried with his sword in his right arm and his lyre resting on his left arm (Fig. 2). The lyre shows clear signs of long use, so it was not created simply as a symbolic funerary object. The man lying in grave 31 in Oberflacht, Germany (610 CE) held both his sword and his lyre wrapped in his right arm. This seems to

indicate that the nobleman in each case was not only entertained by the lyre, but actually played it as well. Indeed, a nobleman of the later Middle Ages was expected to wield a sword, ride a horse and play a musical instrument. A 14th-century gravestone from Heysham, Lancashire, England, carved with a harp and a sword is a final remnant of this tradition (Fig. 3a-b). This and the grave goods from Trossingen and Oberflacht show that the tradition of the “warrior bard” lasted at least 800 years.

Lyres were also played by commoners. In Novgorod archaeological remains of lyres and *gusli* are found in all sections of the city and in the houses of all social classes from rich merchant to artisan and craftsman. The Venerable Bede, in his seventh-century *Ecclesiastical History of the English People*, tells of Caedmon, a simple herdsman who worked at a convent. In the evening, when people gathered to drink, feast and celebrate, it was a tradition for a *hearpa* to be passed from hand to hand, each person performing a song before passing it on to the next. Caedmon was ashamed, because he knew no songs and would leave the feasting. On one occasion he went back to the stable, fell asleep and had a

dream in which he was commanded to sing songs in praise of God. Suddenly he was able to sing. Thereafter, he was revered for this divine gift.

The conception of the wandering bard with his lyre or harp upon his back, travelling from court to court and performing for different patrons to earn his keep, is deeply rooted in our popular culture. But this image stems more from 19th-century Romanticism than from any medieval reality, particularly in Wales, where the bardic tradition has been so clouded by Romantic imagery and reenactment, that it is nearly impossible to disentangle ancient tradition from invention. *Asterix* comics and video games such as *Skyrim* have added another layer to the popular image of the bard. We have seen that in reality the bard in the Middle Ages was only one small part of a many-faceted and diverse tradition. The many types of lyre instruments and the myriad of different *filid*, bards, *scops*, *skalds*, *skomorokhi*, poets, historians, musicians, warriors and simple people who played upon them or sang to their accompaniment present a much more colourful picture than the worn-out cliché of the “medieval bard”.



Fig. 1 Mac Sweeney's feast, woodcut from John Derricke's *Image of Irelande* (1581).



Fig. 2 The nobleman from Grave 58 in Trossingen, Germany. Drawing by Christina von Elm (Tübingen)



3a



3b

Fig. 3 a. Harp and Sword on a 14th-century gravestone in Heysham, Lancastershire, England.
b. detail.

4.4 The Medieval Lyre

Thilo Viehrig

To judge from the archaeological finds, the lyre was the most important stringed musical instrument in Europe during the Early Middle Ages. It also appears to have enjoyed a very high social standing. The main constructional elements of the medieval lyre are the soundbox, the two side arms, which extend from the soundbox, and the yoke that connects the two ends of the arms to form a window. The five to eight strings lie parallel to the soundboard. They are either attached to the bottom end of the soundbox and pass over a bridge or they are attached directly to a rod, which is held between two supports, fastened into the soundboard. At the other end of the instrument, the strings are wound around the tuning pins, which are fastened to the yoke. The presence of the window formed by the soundbox, the two arms and the yoke is very important for the playing technique. The left hand of the player reaches the strings from behind through the window while the right hand strums or plucks the strings from the front of the instrument. Early depictions reveal this playing position and technique. For example, an illustration from the eighth-century Anglo-Saxon *Vespasian Psalter* (London, British Library) shows King David with his left hand in the playing window and his fingers resting on individual strings (Fig. 1). In this way, some strings are stopped or damped, so that they do not sound, while the open strings sound when the playing hand strums across the strings. Changing the fingers to damp other strings causes different notes to sound together. Melodies can also be played in this manner, but compared with playing a harp, the player must think in reverse. Alternating damping and plucking with the left hand and strumming and plucking with the right hand offers a myriad of varied and complex musical possibilities.

Like all medieval stringed instruments, the soundboxes of the lyres found in archaeological excavations are hollowed out from one solid block of wood and then covered with a soundboard. The type of wood varies from instrument to instrument, builders appearing to have used whatever wood was at hand.

There are two basic lyre forms: symmetrical and asymmetrical.

The strings of the former are all of the same length, while those of the latter are longer on one side of the instrument, becoming progressively shorter towards the other side. Symmetrical lyres are found in the Germanic, Anglo-Saxon and Scandinavian areas. The most famous of these finds are the Alemannic lyre found in a sixth-century grave in Trossingen, Germany (Fig. 2a-b), as well as the lyre finds from seventh-century graves in Oberflacht in Germany, the Anglo-Saxon Sutton Hoo lyre from a ship burial in East Anglia, England (seventh century) and the Kravik lyre from Numedal, Norway (16th century?). Asymmetrical lyres appear in eastern European and Slavic regions such as Novgorod, Russia (11th -13th centuries), (Figs. 3 and 4a-b) and Danzig, Poland (12th century), but are also depicted on tenth-century stone crosses in Ireland. The form of the lyre – symmetrical or asymmetrical – is important because it may bear upon the material of the strings. In order to produce a pleasant sound, a string must be put under tension by tightening it around a tuning pin. The best sound occurs when the tension is just under the breaking point. When using gut or horsehair strings that are all the same length, it is possible to change the pitch by changing the thickness (diameter) of the string (in other words, by changing the mass of the string). Lower sounding strings have a larger diameter and therefore more mass. Instruments still in use today, such as violins and guitars, have strings of the same length but with different diameters so that they can be tuned to different pitches. This does not, however, hold true for the type of metal strings, made of a yellow brass alloy, which were used during the Middle Ages. The lowest tension possible to make a brass string sound is so close to the breaking point that the pitch can only be changed slightly by using different string diameters. In order to achieve different pitches of good sound quality throughout, the brass strings must be of different lengths and the instrument must be asymmetrical to accommodate the different string lengths. This is confirmed by the finds from Novgorod, Russia, the most important archaeological site for a variety of asymmetrical lyres, where brass

wire has been found. Therefore, symmetrical lyre construction may indicate the use of gut or horsehair strings, while asymmetrical construction may indicate the use of brass strings.

Archaeological finds and iconographic depictions suggest that lyres of many different sizes were in use in the Middle Ages. Large lyres with a full sound would have been suitable in performance situations, for accompanying song or recitation. Alongside the larger instruments there were also smaller lyres with less volume and a higher sound, which were easier to transport and were perhaps used for dance music. An example of this type is the six-string lyre from Novgorod (Fig. 4a-b). Interestingly, this instrument's playing window is divided into two parts, and it is so small that the hand must remain behind the window and only the fingers can be stretched through it to touch the strings.

The nature of the tuning system in use for the lyre in the Middle Ages remains an open question. However, based on later and current practices, we can assume that there was no uniform tuning system and that the instruments were tuned according to the particular requirements of the music. Depending on the mode, the strings were tuned and retuned to accommodate semitones in different relations to the fundamental note.

The question as to whether or not medieval lyres had soundholes has led to much discussion and debate. Before the discovery of the lyre of Trossingen, it was not possible to determine whether or not earlier lyre finds had soundholes because the soundboards were damaged or fragmentary. Since the most fragile spot on a thin soundboard is that place where a soundhole has been bored or carved out, it is possible that the soundboards broke at exactly those places and that the pieces that originally had soundholes are damaged or missing from the finds. However, the spectacular find in Trossingen revealed a well-preserved lyre complete with bridge and tuning pins and an undamaged soundboard. Only the strings and string holder are missing. The soundboard has ten small

soundholes, which taken together would result in a fairly large composite soundhole (Fig. 5). Practical experiments have shown that a lyre can function with or without soundholes, but that there are definite differences in the sound. Lyres of both types may have existed side by side.

Naming an instrument that has “died out” and is no longer in current use can be problematical, especially if the meaning of its original name has changed through time and place or multiple translations. King David's instrument (Hebrew *kinnōr*), which in biblical times was most probably a type of lyre, became a “harp” in later translations of the Bible because the Latin word *cithara* can refer to various stringed instruments. Furthermore, just as the word *harpa* in Scandinavian languages is used for all stringed instruments, whether harp, lyre or bowed instrument, the same was true for the word *gusli* in medieval Russia. In modern usage, all plucked stringed instruments excavated in Novgorod, including the lyres, are typically referred to as *gusli*. The *gusli* which is still in use in modern Russia usually has many more strings than the archaeological finds, but no playing window, and it is therefore played laid flat on the lap. For this reason it may be confusing to refer to the archaeological finds of lyres from Novgorod by the name of *gusli*. Just as we now use the terms *Anglo-Saxon lyre* and *Alemannic lyre*, it would be preferable to use the term *Novgorod lyre* instead.

Wood usually disintegrates rapidly when buried in the ground; therefore archaeological finds of wooden instruments are extremely rare. The Novgorod, Trossingen and Oberflacht sites, however, provided exceptional conditions for the preservation of wood and leather, as the ground was constantly waterlogged. Thanks to the saturation of the soil at these sites, their beautiful instruments have survived to be reconstructed and their sounds heard once again.

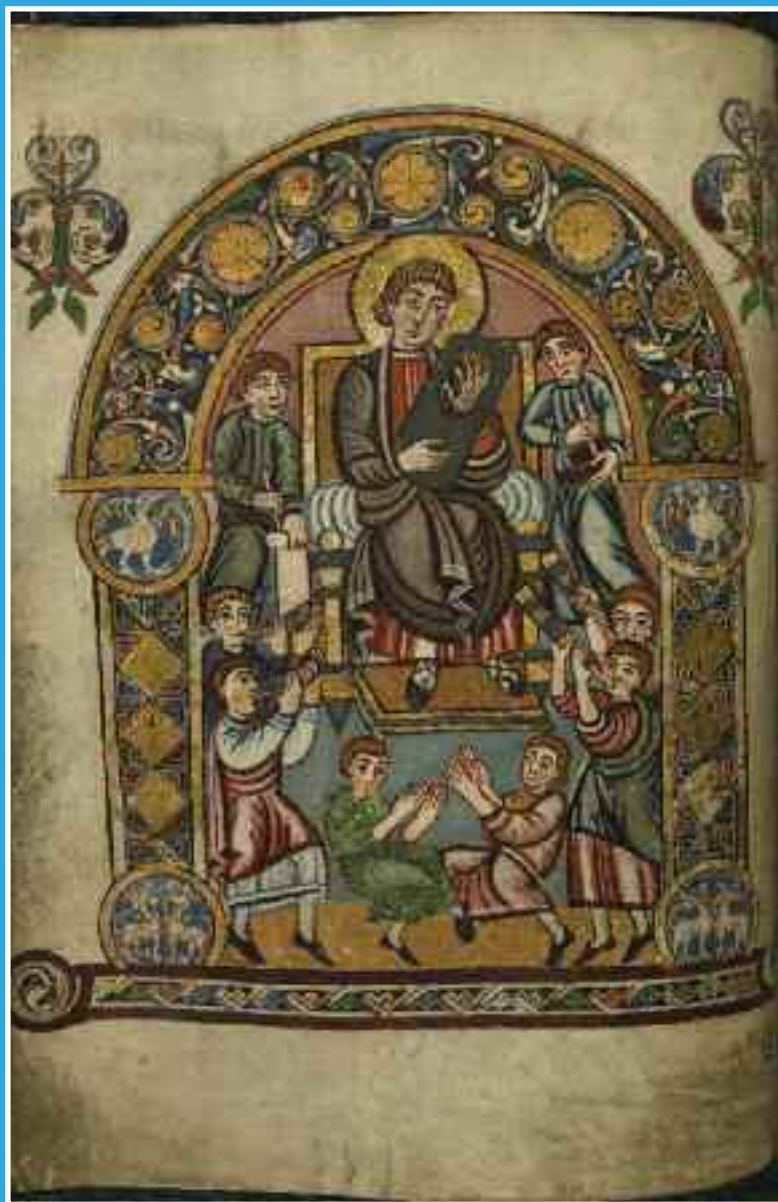


Fig. 1 King David with the lyre, showing the typical hand positions and playing technique. British Library Board, Cotton Vespasian Psalter, f.30v.



Fig. 2 a. Front side of an example of a symmetrical lyre: reconstruction of the Lyre of Trossingen by Thilo Viehrig and Jan Ellen Harriman.
b. Back side of the instrument.



Fig. 3 Lyre playing position demonstrated on a reconstruction of an eight-string asymmetrical lyre from Novgorod, Russia, with brass strings built by Thilo Viehrig.



Fig. 4 a. Remains of a six-string lyre from Novgorod, Russia (12th century) / **b.** Reconstruction by Thilo Viehrig.



Fig. 5 Close-up of the soundholes on the Lyre of Trossingen (reconstruction by Thilo Viehrig and Jan Ellen Harriman).

4.5 Al Andalus Clay Drums. Music for Weddings and Festivities

Raquel Jiménez Pasalodos, Alexandra Bill

Throughout the world, music is present in important moments of the life of communities and individuals, such as in weddings. In Islamic medieval Spain, it seems that frame and clay drums were a fundamental instrument in marriage ceremonies. Music at this time was heavily regulated and censored, and tolerance of particular practices allows us to determine the popularity of certain musical traditions. Strict laws governing the permitted use of music were decreed within the *ḥisba* treaties (writings from *Mālikī* doctors of law who comment on the correct observance of Islamic law). They largely prohibited the use of music and musical instruments, but there is an interesting exception: the use of drums such as the *duff* (a tambourine) and the *kabar* (most likely a cylindrical drum) in weddings and other celebrations. The treaties also indicated that such instruments were to be used by female attendants in the beginning of ceremonies, a practice which was permissible under Islamic law.

The evidence presented in these treaties is supported by iconographic evidence, of which one particular example stands out – the Tavira Vase (southern Portugal, Almoravid period, 12th century), a rare and exceptional artefact. The object is a ritual vase, whose imaginary, it has been suggested, represents the ritual kidnapping of a Berber bride. In this image, a female riding a horse is surrounded by two other figures, which have been interpreted as mounted warriors, four animals and two musicians. One of the musicians is playing a frame drum, and the other holds a small cylindrical drum. The representation of these particular instruments is broadly in keeping with the instruments described as permissible in the *ḥisba* treaties, and as such, their depiction on the Tavira Vase provides strong supporting evidence for the use of these percussion instruments at weddings.

Thus, we have clear iconographic evidence, but do we have archaeological evidence of these instruments? Musical instruments

such as the *duff* were produced from organic materials, which means that their existence is very difficult to detect in the archaeological record. Fortunately, clay drums are commonly found in a wide variety of archaeological sites in Al Andalus (as evidenced from the artefacts we have from the ninth to the 14th centuries), providing valuable information regarding the use of these instruments in popular musical contexts. The important number of findings attests their importance and popularity in medieval times.

Ethnographic comparisons are additional supporting sources used by music archaeologists in order to contextualise such instruments. The presence of clay drums in the archaeological record and their use in traditions and rituals of the Iberian Peninsula ceases after the conversion of the area to Christianity. We see that their use and popularity continued, however, if we look South to our North African neighbours, only fourteen kilometres across the Straights of Gibraltar. The relationship between drums and female musicians who play in festival and wedding celebrations is still apparent in contemporary Moroccan society. Professional female singers, known as the *šihāt*, have traditionally accompanied their songs with the *ta'ṛīja-s* (small clay drums) at weddings and other occasions. Nevertheless, most of these singers are discontinuing their use of these drums as a result of the inclusion of modern instruments in the ensembles. There also exists within modern contexts other female ensembles, called *m'almat*, who perform at weddings and other important cultural events. The *m'almat* employ a wide range of vocal styles and utilise a variety of percussion instruments, such as the *bendir* (a *duff*), the *riq* (a tambourine with jingles), the *gwell* (a larger version of the clay *ta'ṛīja*) and the *tabla* (a clay bongo). When a family cannot afford to hire any of these professional musicians, women of the community accompany the bride during the traditional *henna* party, singing to the rhythm of clay and frame drums while the bride gets the *henna* decorations

on her hands and feet. Despite the modernisation of the ritual, the use of clay instruments is still alive and seems to have a vibrant future, especially in those rural areas, where women still sing and

play these instruments, sometimes even along with recordings containing the traditional wedding repertoire.

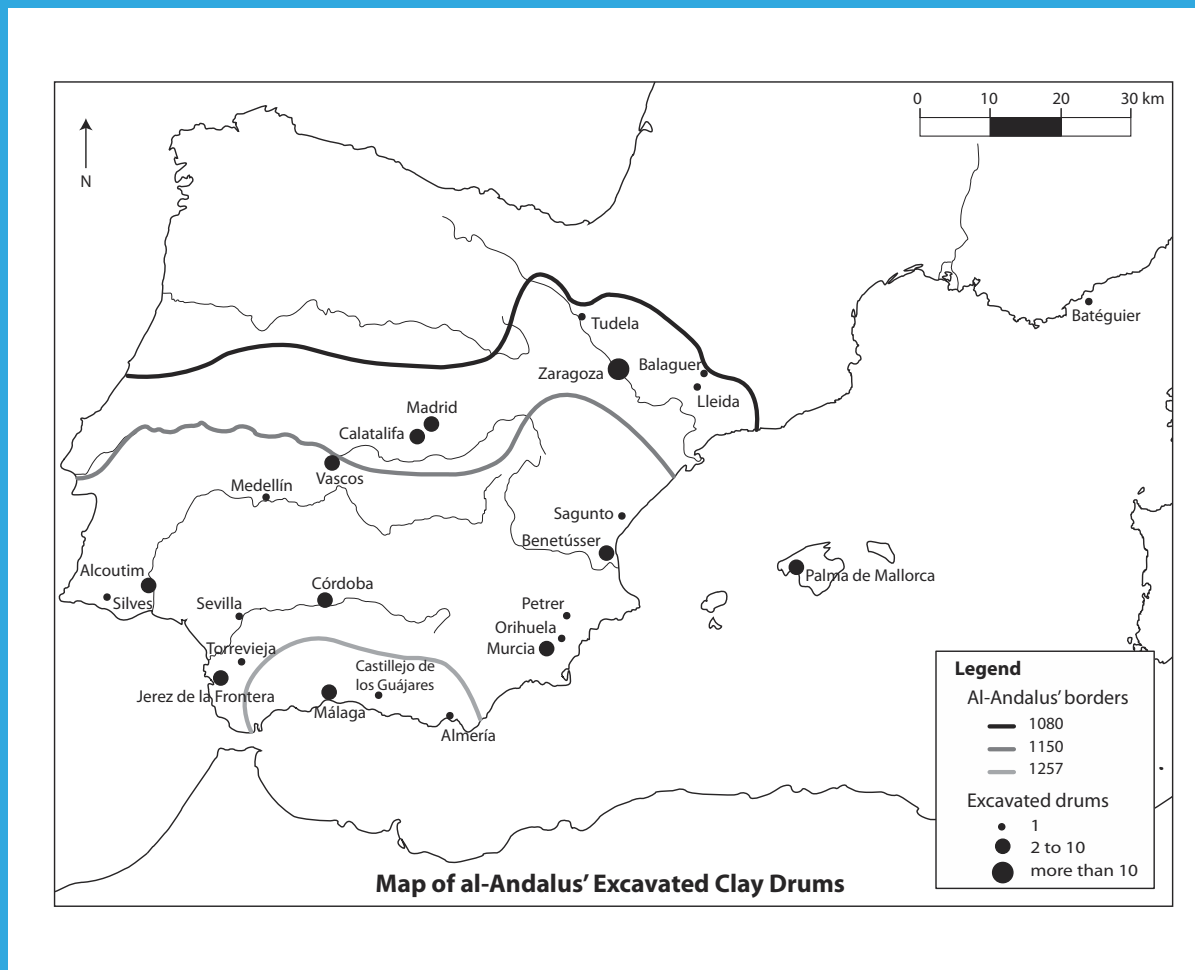


Fig. 1 Map of findings showing the different phases of Islamic occupation and the drum finds.



Fig. 2 Drum of Torrevieja (10th century). Cádiz, Museo Municipal de Villamartín.



Fig. 3 Drum of Plaça de Baix, Petrer, Alicante (10th–11th centuries). Alicante, Museo Arqueológico y Etnológico Dámaso Navarro.



Fig. 4 Drum of el Castillejo de los Guájares (Granada, end of 13th century beginning of 14th century).



Fig. 5 Modern Moroccan *ta'rija*-s , measuring between 12 and 36 cm.



Fig. 6 Almohade musician (12th-13th centuries). Córdoba, Museo Arqueológico y Etnológico.

4.6 Triplepipes. A Forgotten Tradition

Barnaby Brown

A triplepipe is a doublepipe with a drone. The drone fundamentally changes the musical possibilities, as a gain in sonic richness is offset by a sacrifice in tonal flexibility and the only way to modulate is to change instrument. A glorious living triplepipe tradition survives in South Sardinia, where this instrument is called the *launeddas*. Professional *launeddas* players typically carry over 20 instruments with them and the tonality of a piece is defined by the instrument they select from their case: the length of its three pipes and the position of the holes on the left- and right-hand chanters. Sardinia also possesses the earliest evidence for the triplepipe – a bronze figurine from around the sixth century BCE (Fig. 1). But while many ancient doublepipes survive, we do not know the lengths or hole positions of any triplepipes before the 19th century.

The iconographic and literary evidence suggests that the triplepipe was popular in Sardinia, Ireland, Scotland and England. Some aspects of the Sardinian *bronzetto* resonate with Scottish Highland tradition – the three splayed pipes, the bonnet worn by pipers when they play, and the display of genitals. The striking combination of male and female in the Sardinian *bronzetto* suggests either a fertility divinity or an Aphroditus with apotropaic qualities: warding off evil, bestowing good luck, dispelling sadness, or scaring away an enemy. This last function brings to mind scenes of Highlanders lifting their kilts in films like *Carry on up the Khyber* and *Braveheart*, but as the *bronzetto* has no kilt, the other functions are perhaps more likely.

After a gap of over a millennium, triplepipe iconography resurfaces on five Celtic Christian crosses carved in the period 750-950 CE (Figs. 2-4). Three of these are among the most magnificent monuments of the Celtic Church, erected by scholarly foundations that venerated Greek culture and absorbed late antique traditions in the early Middle Ages. Two stand a stone's throw away from where the kings of Scotland and Ireland were buried and it is conceivable that the triplepipe played a prominent role in the funeral processions of medieval Gaelic nobility, given the strong association

between piping and laments in earlier Roman and later Gaelic cultures. All five crosses share certain features: the triplepiper is dressed like a monk, he appears to be a representation of a real person and he is paired with a player of harp or lyre. An exception to this assemblage is seen on the cross at Ardchattan (Fig. 2) where a third musician is represented. Unfortunately, the outlines of his instrument are somewhat conjectural because the stone is badly weathered; but other stones and the warrior below, holding a spear and a shield, suggest that the third monk may be playing a horn.

Like the piper's bonnet, the opposition of stringed and wind instruments has deep roots. For example, in the Hebrew *Old Testament*, in Job 30:31, we find that "My lyre is tuned to mourning, and my pipe to the sound of wailing" (NIV). The communities that produced these crosses knew their Bible well; indeed, the rectangular object between the harper and piper in Fig. 3 is probably a Psalter.

An inscription on the Cross of the Scriptures at the monastery of Clonmacnoise (Fig. 4) tells us that it was carved and erected by Abbot Colman in honour of King Flann, who died in 914 CE. By extraordinary good fortune, a tale survives that ties these visual representations of the triplepipe to its name at the same time and place. A young prince called Oengus Mac Díchoíme, so the story goes, made a pipe which some say was double (*dégabail*), others say was triple (*tregabail*). Either way, Oengus made his pipe from three saplings that sprouted from where, over a year earlier, three streams of blood had flowed from his nostrils and lips when he fell on his face while crossing a moor. The first part of the story ends with an illuminating statement, "though he had become king he did not part from his pipe", revealing that this attachment to a pipe was un-kingly. The tale refers to his instrument interchangeably as *cuisle(nn)* or *buinne* and in the second part we learn that it can be heard from a great distance and the milk yield of any animal that hears its sound is tripled. Is its power over animals the reason why we see a horse, a hound and a serpent in Fig. 2, a wild boar in Fig. 3 and three cats in Fig. 4? Another ancient theme may be being

invoked here: the use of music to civilise barbaric traits in humans.

When Oengus kidnaps a young servant girl, Saint Brigit (451-525 CE) intervenes. She commands the king to liberate the girl or to hand over his instrument. He chooses the latter but, as Brigit could foresee, without his pipe he dies of anguish after only nine days. She dismantles his powerful instrument, giving one chanter to the girl's mother, the other to her confessor, Saint MacTail (d. 548 CE), and keeping the third tube or "foot of the pipe" (*cois na cuislinne*) for herself. The story ends with a fascinating note: Brigit held this staff, "the victorious one", in her hand when she died "as a mark of her rank of bishop; for the single-ended crooked staff is no greater a crozier than the double-ended straight one". Medieval Irish croziers are significantly shorter than their continental counterparts – a complete specimen found in the river Bann, Co. Antrim, measures about one metre. This is perfectly comparable in length to the *tumbu* or drone-pipe of a *launeddas*.

The ninth-century tellers of this tale were unsure whether the pipe Brigit dismantled was double or triple. The same confusion is found from manuscript workshops centuries later in southern England. On two separate occasions a doublepipe in the exemplar becomes a triplepipe in the copy. Once this happened in about 1000 CE when copying an illustration of the vice Indulgence in one of the most popular poems of the Middle Ages, the *Psychomachia* by Aurelius Prudentius Clemens (Fig. 5). Another time, ca. 1230, a representation of a pipe-playing siren in a Bestiary suffered the same fate. Obviously the iconographic tradition was derived from an ancient manuscript depicting doublepipes and the medieval copyists changed these into the triplepipes with which they were familiar.

Notwithstanding their association with Indulgence in the illustrations to the famous poem, when put to the purpose of meditation or praising God, instruments were tolerated and even wholeheartedly embraced, thanks no doubt to their prominent use in the Psalms. A splendid illumination of King David in the Hunterian Psalter shows a boy playing a triplepipe opposite a fiddler (Fig. 6).

This positive view co-exists with the negative view expressed, with far-reaching impact, by two church fathers contemporary with Prudentius, Saint Augustine and Saint John Chrysostom. They denounced Christians who spent the whole day dancing and in much Christian iconography, fuelled by their writings, instrumental music symbolises living for pleasure and losing one's senses. In a carving of similar date to the Hunterian Psalter, also from southern England, we find another fiddler and triplepiper facing each other, this time in a negative light (Fig. 7). Rather than humans praising God, these players are animals. Both ram and goat were associated with lust and this carving continues the iconographic tradition witnessed in the *Psychomachia* illustrations. It was probably intended as a warning against the temptations of the flesh.

Sages who viewed music in general, or the playing of reed instruments in particular, as dangerous have been widely ignored since ancient times. Sainly behaviour, consonant with the prescriptions of the church fathers, was certainly to avoid instruments as far as possible, but a more realistic view of the triplepipe in medieval Gaelic society emerges from the following ninth-century story, probably written by a follower of Saint Máel Ruain of Tallaght:

"There was a piper, Cornán, who lived in Descert Lagen and he was an anchorite. They called him Cornán of the Glen (Glen Essa), a man of grace. Presents were sent to him from Máel Ruain. He once asked Máel Ruain's monks: «I would crave a boon to play a tune to the cleric». But Máel Ruain answered thus: «Tell Cornán, these ears are not inclined to earthly music in order that they may be inclined to the music of Heaven»".

Máel Ruain died in 792 and his teachings, modelled on those of the Desert Fathers of Egypt, emphasized forbearance from bodily indulgences, daily recitation of the Psalter and separation from worldly concerns. Taking this story and the five crosses together, it would appear that a religious stream of piping continued from Classical Antiquity into the Middle Ages. Pipes were not only

associated with the emboldening of warriors, funeral processions, drunken parties and courtesans whose lips gave multiple forms of pleasure; they were also played by priests and religious ascetics who had renounced sex completely.

Cornán's offer to play his *cuislenn* to thank the saint whose monks were bringing him food suggests that, for this holy man at least, the triplepipe served as a form of meditation, or means of coming closer to God. Then as now, music was a way to transfigure earthly reality and to escape the human condition, if only temporarily.

Anchoritic living was the earliest form of Christian monasticism and the tale about Cornán is consistent with a second-century Christian apocryphal text, the so-called *Acts of John*, where Jesus sings a hymn containing the following lines:

ἀλλῆσαι θέλω· ὀρχήσασθε πάντες. Ἀμήν.

"I would pipe, dance ye all. *Amen*".

θρηνηῆσαι θέλω· κόψασθε πάντες. Ἀμήν.

"I would weep, lament ye all. *Amen*".

The song is placed in a setting following the Last Supper with the disciples holding hands and dancing in a circle around him. The mention of pipes is probably metaphorical. Nevertheless, it would be unwise to rule piping out of the diversity of Christian musical practices that existed in the first four centuries, even later in places like Sardinia, Ireland and Scotland. Repeated disapproval from the likes of Celsus, Augustine and Chrysostom demonstrates that attitudes in many Christian communities were not harsh, but ambiguous, persistently incorporating or at least tolerating older religious traditions in which piping and dancing were strong.

The simplistic polarity that would associate lyres (and later harps) with "good" and pipes with "evil" fails to reflect historical reality even more than past ideologies. Both the triplepipe and its stringed complement were heard in the den of Indulgence; both were played by angels, as witnessed in the 13th-century *Choir of Angels* in Westminster Abbey; both were played by princes like Oengus; and both were played by holy men like Cornán. It was more conventional for kings and clerics to play the lyre or harp, but perhaps only because circular breathing led to facial disfigurement and because pipes were common and therefore less dignified. Mouth-blown reed-pipes were cheaper and easier to make and every type of evidence – material, iconographic, textual and ethnographic – testifies to their greater popularity amongst ordinary people. Although literary evidence consistently portrays piping as less reputable than lyre playing, for any civic or religious function involving a crowd, pipes had the advantage of being louder.

This brings us back to the Nuragic *bronzetto*. The dancing after Mass on Sundays, practiced for centuries in South Sardinia, functioned as a powerful mechanism reinforcing social decorum and self control. Could this respectable form of dancing have been shaped by ideas of cosmic order, or *musica divina*, connecting some elements of medieval Christianity with the *dithyramb*, the circle dancing of Ancient Greece? Given piping's prominence at the centre of so many popular religions between Nuragic and Celtic Christian times, we may safely conclude that Sardinia's *launeddas*-accompanied dances stand out as one of Europe's strongest and deepest connections with its musical past.



Fig. 1 Nuragic *bronzetto*, first half of the first millennium BCE, h. 8 cm, from Ittiri, Sardinia.



Fig. 2 Ninth-century cross slab at Ardchattan Priory, Argyll, Scotland.



Fig. 4 Cleric playing a triplepipe (ca. 914). Cross of the Scriptures, Clonmacnoise, Ireland.



Fig. 3 Luigi Lai and Patsy Seddon playing contemporary relatives of two instruments represented on a ninth-century cross slab at Tower of Lethendy, Perthshire, Scotland.



Fig. 5 Soldiers tempted by Indulgence in the Psychomachia of Prudentius (ca. 1000). Cambridge, Corpus Christi College, MS 23, Part I, fol. 19v.



Fig. 6 King David surrounded by musicians, Hunterian Psalter, (ca. 1170). Glasgow, University Library, MS U.3.2, fol. 21v.



Fig. 7 Ram playing a fiddle and goat playing a triplepipe (ca. 1200). Hawkchurch (Devon, England), Church of St John the Baptist, South arcade capital.



5.1 A Gift from the Gods. Music in Ancient Greek Myth

Stefan Hagel

People like to tell stories of how things began – from the creation of the world to the formation of their own social group and the source of all their important cultural activities. The heroes of such stories may be mythical ancestors or just as likely, secondary characters introduced for the solitary purpose of recounting a creation story. When it comes to music, a well-known instance for the latter case is the Bible's first instrumentalist, Jubal, who plays no role other than inventor. At the other end of the spectrum is the approach taken by the ancient Greeks, whose major instruments were nothing less than inventions of the gods themselves. However, those inventions were not intended primarily as gifts for mortals; rather, music was as much a part of the Olympians' bliss as of human festivities. Thus, the dancing maiden choruses of Greek cities found their model in the divine chorus of the Muses, goddesses so exclusively devoted to singing and dancing that they aptly lent their name to the art. Homer addresses them, both in the *Odyssey* and the *Iliad*, as the sources of his song. Hesiod – in the Greeks' view the only poet to possibly rival Homer – describes his own vocation by the Muses, from the life of a shepherd in a miserable corner of Greece, to a career as a singer who won prizes at influential courts – and dedicated the most prestigious of these prizes to his divine patronesses. His vivid account of their art still resonates with European archetypes of musical beauty:

“Come on, let us start from the Muses, who please
Father Zeus' great mind with their song within Olympus,
stringing together what is and what will be and what was before,
according in voice: untiringly their song flows
sweet from their mouths. And the houses
of loud-booming Father Zeus laugh with the goddesses' lily voice
spreading around...” (Hesiod, *Theogony* 36–42)

Favourable though the Muses are to their devoted followers, they are as ready to punish human arrogance as any ancient god: so,

when the singer Thamyris boasted that he would win a contest even if the Muses themselves participated, they immediately maimed him both physically and mentally, “taking from him the gift of divine song and making him forget the art of lyre-playing” (*Iliad* 2.599f).

Lyre-playing was not originally the Muses' domain, even though in later periods they were depicted with all kinds of instruments. On Homer's Olympus, it was Apollo who accompanied the Muses on his strings, and the lyre would always remain one of the ever-young god's main attributes, in addition to his bow. However, the lyre was not Apollo's invention. A hymn from the sixth century BCE famously describes how his cunning younger brother, Hermes, found a tortoise outside his mother's cave immediately after his birth and recognised its musical potential right away. After heartlessly slaughtering the animal and a few moments of divine craftsmanship, the first lyre resounded in the baby-god's arms. Music, however, was not Hermes's main concern, so he went about his business, which involved stealing Apollo's cattle. Only after being discovered did he reveal his musical invention to his astounded brother, who gladly accepted the lyre as recompense. Then, in order to have an instrument of his own, Hermes devised the pan flute.

Apollo is no less jealous a musician than the Muses, and in the best known instance of his jealousy, he exhibits a degree of cruelty that has fascinated sculptors and painters for many centuries. The story also involves Athena and her invention of the other central Greek instrument, the doublepipe (*aulós*). At first, she was enticed by the musical capabilities of this instrument, notably including its ability to imitate Medusa's wailing monster sisters. She then noticed, however, the less than aesthetic effects the hard blowing had on her face and discarded the pipes, which were readily adopted by the satyr Marsyas. This moment of the instrument's transition to the mortal sphere was honoured in a statue group on the Athenian Acropolis, copies of which were widespread throughout the ancient world. Marsyas was said to have perfected the art of playing the *aulós* and transmitted it to mankind. His student Olympus, at the

interface between myth and history, is credited with composing some of the most widely-used sacred tunes of Antiquity. Marsyas, however, ends up competing against Apollo on the lyre, and while he might have been declared victor as long as only instruments were involved, Apollo finally defeats him by adding song to his music. Enraged nonetheless, Apollo has his opponent flayed alive, though some say he soon regretted his vindictiveness.

While the Olympian gods share the civilised world's stance on music as a source of joy, in more remote settings it becomes a dangerous weapon employed by more sinister deities. The beautiful song of the sorceress Circe helps to dispel the suspicion of Odysseus' comrades, whom she subsequently turns into pigs. The music of the Sirens – half women, half birds – was outright deadly. Their divine song, promising joy and wisdom alike in the revelation of things past and present, lured unwary sailors toward their island

where the sailors inevitably perished, adding their bodies to the heaps of bones and rotting flesh of earlier visitors. Only two ships managed to pass by the Sirens unharmed. The crew of heroes manning the Argo was saved by one of its members – Orpheus, who proved able to drown out the Sirens' voices with his own music. Later, Odysseus, warned by Circe, survived the Sirens' song by having himself tied to the mast of his ship and instructing his crew to firmly plug their ears with wax.

In the end, Greek storytelling ensured that civilised music prevailed. Persuaded by Hera, the Queen of the gods, to enter a competition with the Muses, the Sirens lost their feathers to these and subsequently threw themselves into the sea. Transformed into white islands, they testify to the ancients' belief in the latent destructive powers of music as well as in its huge socio-political potential when domesticated for the benefit of civilisation.

5.2 King David

John Franklin

The rich evidence for ancient Jewish music converges on King David, who, though himself surely historical (ca. 1000–960 BCE), was equally a subject of legend – not least for his lyre (*kinnōr*). That this instrument had been fundamental to Syro-Levantine cult-music from the third millennium BCE onwards is shown by abundant textual and visual evidence, including the remarkable Divine Kinnāru of Ugarit (Syria, ca. 1300 BCE) and Kinyras, legendary lyre-king of Cyprus before the advent of Aegean settlers from ca. 1200 BCE. The Bible itself made the lyre an antediluvian invention by Jubal, the legendary first musician, and recognized its use among the Aramaeans and Phoenicians. The *kinnōr* also featured in the musical group among whom David’s predecessor Saul prophesied, in his first kingly act. This ensemble, sometimes called a “Canaanite orchestra”, is well illustrated by Cypro-Phoenician symposium bowls from the tenth to eighth centuries BCE, and an Ugaritic text lets it be traced earlier still. Here was the model for the musician clans which David, according to tradition, inaugurated for the Ark’s procession to Jerusalem, led by the lyrist king himself. This scene, especially, clarifies the instrument’s divinization at Ugarit, its magical powers as implied by the famous “Orpheus jug” (ca. 1100 BCE), and its potency in royal cult. Indeed David’s kingship depended ultimately on his ability with the instrument. When King Saul suffers from an “evil spirit” – having lost God’s favour – he calls for a

kinnōr-player to heal him. Because David’s music is inspired by “the spirit of the Lord”, he is summoned to court and begins his inexorable rise.

David’s legacy as “sweet psalmist of Israel” was multifarious. Many songs were attributed to him, both in the Book of Psalms and at Qumran; several perpetuate the *kinnōr*’s magical powers. The eternal covenant with Yahweh meant that the messiah would be a second David. Hence the lyre-coins of the Bar Kokhba revolt (132–136 CE) called for a messianic restoration of the temple. Another outgrowth was the early Christian trope of Jesus as a cosmic lyrist who tuned and played the souls of his believers – a conception most fully elaborated by St. Ephraim the Syrian (ca. 307–373 CE), though in the west it equally incorporated pagan ideas associated with Orpheus, Apollo et al. The Rabbinic tradition envisioned David at an eternal banquet leading his royal descendants and the angelic host in singing to Yahweh, across from whom David was enthroned. Arabic tradition, including the Quran and the *Arabian Nights*, maintained David as the paragon of musical prophecy and magic – hypnotizing birds, beasts, and the natural world through God’s power. David and his musicians also became a favourite subject for illuminating in medieval manuscripts – scenes valuable for what they reveal about contemporary European music and conceptions of the musical past.

5.3 Orpheus

Pauline LeVen

The Greek hero Orpheus is the musician's musician. Sources refer to him as either the son of the god Apollo or the son of the Muse Calliope and Oeagrus, King of Thrace (an ancient territory covering modern northern Greece, western Turkey, and southern Bulgaria). A singer of incomparable talent, a poet and a shaman, he accompanied himself on the lyre (a seven-string instrument struck with a plectrum). Some ancient authors attribute the addition of three strings to the four-string turtle-shell lyre invented by the god Hermes to him. Orpheus accompanied the Argonauts on their quest for the Golden Fleece and steered them away from the dangerous Sirens with his own song. His irresistible voice could even subdue wild animals and move trees and rocks (see Fig. 1a and 1b).

Orpheus's biography is a Late Antique synthesis of earlier stories, but his myth is most famous from the first-century BCE Latin poets Virgil and Ovid. According to Charles Segal, "Fundamental elements in the myth form a triangle: art, death and love. The meaning of the myth shifts as different points form the base: love-death, love-art, art-death". The hero's life unfolds along the following lines: Orpheus married Eurydice, but, bitten by a snake, she died on their wedding day. Heartbroken, Orpheus went down to the Underworld to rescue her and sang a song so beautiful that the rulers of the Underworld were moved to let Orpheus return with his wife, on the condition that he would not look back at her (Fig. 2). As

he was reaching the end of his journey, Orpheus looked back (out of love? out of arrogance? Out of doubt? Scholars still debate the meaning of this glance) and lost Eurydice forever. Widowed a second time, Orpheus spent the rest of his life playing music and practicing mysticism, and he turned to the love of young men. Thracian women enraged by his contempt for the female gender killed him and dismembered him (Fig. 3). His head, still singing, floated to the island of Lesbos (Fig. 4).

The Greco-Roman hero continued to exercise his influence on modern Europe; since Antiquity, every art and every century has relied on the figure of Orpheus, a sort of musician without borders. He has inspired innumerable pieces of art, from one of the first operas composed in sixteenth-century Italy (Monteverdi's *Orfeo*) to German-language poetry (Rilke's *Sonnets to Orpheus*) and twentieth-century French cinema (Cocteau's *Orphée*).

Perhaps more than the story of a man, the myth of Orpheus encapsulates a reflection on the power and nature of music: is music what we have in common with animals, or with the gods? Are musical instruments like any other objects, or do they have supernatural agency? And can music overcome violence and death? Like King David and the Cypriot king Cinyras, Orpheus embodies the human capacity to create harmony with nature through music and illustrates the connection between music and the supernatural.



Fig. 1a Orpheus charming the animals (the musician is wearing a Phrygian cap and costume, holding a tortoise-shell lyre, and with his right finger pointing at the effect produced on the animals by his music). Floor mosaic, from Building A of the Piazza della Vittoria in Palermo (third century CE). Archaeological Museum of Palermo.



Fig. 1b Orpheus charming the animals (third century CE). Archaeological Museum of Thessaloniki.



Fig. 2 Orpheus playing to Hades and Persephone in the Underworld (Orpheus, dressed with the splendid robes of a musician performing in a Greek musical competition, plays for the king and queen of the Underworld. The seated king seems to make a gesture of approval). Apulian red-figured volute-krater from Canosa attributed to “The Underworld Painter” (ca. 330 – 310 BCE). Munich, Antikensammlungen.



Fig. 3 Thracian woman killing Orpheus (the musician holds the instrument in his left hand, as far away as possible from the attacker; his right side is bleeding, pieced by a lance thrown by a Thracian woman).

Red-figure amphora, from Italy, attributed to Oionokles (ca. 475– 425 BCE).

London, British Museum.



Fig. 4 The head of Orpheus, floating and singing after the musician's death (a man resting his left leg on a rock reaches for the oversized head with his hand and two poles as a woman holding a lyre looks on).

Attic red-figure hydria (ca. 440- 430 BCE).

Antikenmuseum Basel.

5.4 Panpipes in Antiquity and the Middle Ages. Between Myth and Reality

Susanne Rühling

One of the attendants of the goddess Artemis (Roman: Diana) was a beautiful nymph named Syrinx. Eternal virginity was highly valued by her, but Pan, the god of shepherds and fertility and a son of the God Hermes (Roman: Mercury), became infatuated with her, of all people. However, she ignored his constant entreaties and fled across the land until she came to a river which impeded her flight. In desperation she begged her sisters for help, and her pleading was heard. A magic spell turned her into a plant. When Pan caught up with her, he found only hollow reeds in her stead. However, when the wind wafted across them, it produced gentle sounds that reminded the god of the sweet voice of Syrinx. So he decided to collect the stalks and bind them together; panpipes were thus invented, and both the name and sweet voice of Syrinx – like the tones of a flute – were forever connected with her unhappy suitor.

The name of the nymph is of course invented from the Greek name of the instrument: *sýrinx*. In Latin sources, panpipes were also referred to by other terms, related to their shape or to the material used in their construction. For example, panpipes might have been called *arundo* (Latin, “cane”), *fistula* (Latin, “tube”) or *buxus* (Latin, “boxwood”).

The customary form of modern panpipes consists of several pipes bound or glued together. Ancient images show a variety of shapes. Panpipes were frequently in the form of a raft, with parallel pipes of equal length, or wing-shaped, with a gradation of pipe lengths. Less common was a shape composed of two rectangles, with each rectangle having a set of either short or long pipes. Panpipes were made from a wide range of materials and there are records that hollow reeds, wood, horn, bones, various metal alloys and even ceramics were used. The number of pipes varied there often being five, seven or nine. The instrument could be precisely tuned by partially filling the individual pipes with wax or other materials.

The use and further development of a musical instrument depends upon its functional context. Panpipes in their various forms are among the least evolved or modernised instruments. They can be found worldwide in many cultures and in almost all epochs and are typical representatives of so-called traditional musical instruments – in this case a shepherd’s instrument used in his day-to-day life – but also had a role in rituals. Panpipes were probably used as signalling instruments in ancient times and today, they are still regarded as the attribute of Pan, and by extension, of shepherds in general, which puts them in the category of instruments used by “simple folks”.

There is archaeological evidence from Roman times for panpipes made from a single piece of boxwood. When played, reproductions of such original finds are considerably louder and have richer overtones than similarly constructed instruments from other kinds of wood. Studies of relevant ancient and medieval images and comparable archaeological finds of panpipes of this type show that this particular type was common in Europe from the first through to the 13th centuries CE. There are contemporaneous images and archaeological finds from Belgium, Germany, France, Great Britain, the Netherlands and Switzerland. They usually have five to eight bores, and the boxwood is frequently decorated on the outside with incisions. A hole is usually drilled at the end opposite the blowing edge, probably to attach a carrying strap.

One archaeological find of this type comes from Titz-Ameln in the German Eifel. In the late 1990s part of a panpipe was found here in a well during the excavation of a settlement which had been used during the Iron Age and the Roman Imperial Period. The fragment was broken lengthwise in half; unfortunately, the other part was not retrieved (Fig. 1). The instrument tapers from bottom to top in a curve, and the preserved part has a bevelled corner at the bottom. Its polished surface is marked with incisions on both sides. These

appear to imitate panpipes made of individual joined pipes. Based on accompanying finds, the instrument is dated to a period somewhere between the end of the second and the beginning of the third century CE. Other finds suggest that the original may have been provided with three or four additional bores. A comparable item surfaced in Eschenz, Switzerland, in 2004 (Fig. 2). Thanks to favourable conditions this instrument was preserved almost intact, being damaged only on one corner. It has seven bores and dates to the first century CE.

It is possible that the Cologne 'Dionysos mosaic' from the third century CE (Fig. 3) shows a panpipe likewise made from a single

piece of wood, held by a nude, wreathed boy or satyr in the entourage of the wine god. There are also many visual depictions from the Middle Ages, suggesting that this instrumental tradition continued beyond classical antiquity. Especially in France, one finds depictions of panpipes in the hands of statues, in reliefs on churches and in illuminated manuscripts. One, especially rich in detail, is found on a portal of Chartres Cathedral (Fig. 4). Among the archaeological finds from the Middle Ages, one from York in Great Britain and ascribed to the Viking culture deserves mention. This boxwood panpipe with five preserved bores likely dates to the tenth century CE.



Fig. 1 Panpipe from Titz-Ameln, Germany.



Fig. 2 Panpipe from Eschenz, Switzerland.



Fig. 3 Section of the Dionysos mosaic (220-230 CE).
Cologne, Germany.



Fig. 4 Portrayal of a panpipe on a portal of Chartres
Cathedral, France.

5.5 Norse Gods and Music

Cajsa S. Lund

The Viking Age is characterized by overlap of Old Norse religion and Christianity. The mythology and the cult of the pre-Christian Viking religion is known to us primarily through early written sources, such as the Prose Edda and the Poetic Edda, Old Norse sagas, Runic inscriptions, and Adam of Bremen's church history. The literary texts are to some extent relevant for the pagan Viking period despite the fact that they were written down by Christian historical writers at the beginning of the Nordic medieval period.

The Old Norse religion was polytheistic with a great number of deities, both male and female. The gods were divided into two major groups, the *Aesir* and the *Vanir*, sometimes including the giants; the dividing line between these groups, however, is less than clear. There were also diverse groups of minor "supernatural" beings, such as elves and dwarves.

The Aesir were the principal gods. Among them were such well-known personages as Odin (the supreme god) and Thor (the thunder god). The fertility god Frey, or Frö, belonged to the Vanir. The Aesir lived in *Asgard*, a realm separated from the mortal world (*Midgard*) by the rainbow bridge *Bifrost*.

In spite of the great number of divinities, we find only two of them, Odin and Heimdall, directly related to instrumental and/or vocal activities.

Odin is known as the mightiest Norse god. His supreme knowledge includes not only runes but also *galdrar*, a kind of magic songs. He possessed shamanistic powers, and through *seiðr*, a special form of Nordic magic, he had power over life and death.

Galdr is an Old Icelandic word deriving from the verb *gala*, which suggests that *galdrar* were possibly sung with a high and shrill voice, or maybe in falsetto. In the pre-Christian Viking society *galdrar* were chanted in combination with certain rites, for instance *seiðr*. This was usually practiced by women, so-called *völvor*, as it was regarded as shameful for men to be engaged in this shamanistic magic.

It says in the Edda Poem *Hávamál* ('The Ballad of the High One') that Odin knew eighteen powerful *galdrar*. According to Norse mythology it was the Vanir goddess Freyja who introduced *seiðr* to

the Aesir and she is also supposed to be the one who taught Odin this "unmanly" magic.

Did Odin ever use drums? One of the poems of the Poetic Edda is *Lokasenna* ("Loki's quarrel"). This poem depicts a dispute between the gods and Loki who in Norse mythology is a god or giant (or both!). In stanza 24 of *Lokasenna* there is a much-debated reference to what may be Odin using drums when practicing *seiðr*. One theory is that such possible drums might be of the same type as the shamanistic ceremonial Sami drums. Among the many different translations of stanza 24 - and thus different interpretations - is this by Henry Adams Bellows in 1936:

"They say that with spells I in Samsey once Like witches with charms didst thou work;

And in witches' guise I among men didst thou go; Unmanly thy soul must seem".

Heimdall is the watchman of the gods and guards the huge bridge *Bifrost* (the rainbow). His hearing is so acute that no sound escapes him: he can even hear the grass or the wool on a sheep's back grow.

Heimdall's most important function in Norse mythology is to herald the coming of the apocalypse (*Ragnarok*), equivalent to Judgment day, by sounding his majestic trumpet instrument, the *Gjallarhorn* and leading the Aesir into their final battle (see Figure on page 178).

Snorri Sturluson (1179–1241), the Icelandic historian, poet, and politician, and the author of (among other works) the Prose Edda, says that when Heimdall blows his horn it can be heard in all worlds. We are also told that Mimir, the wisest figure in Norse mythology and the watchman of the well of wisdom, uses the *Gjallarhorn* to drink from the well.

There is no information in the written Norse sources about the material, size or shape of the *Gjallarhorn*. Some researchers have interpreted the *Gjallarhorn* as a mythical image of the half moon. A possible Christian influence has also been discussed referring to the likeness of Heimdall to the angels of Revelation, whose trumpets announced Judgement day.



Fig. 1 Heimdall, as illustrated in an Icelandic manuscript from the 18th century.

5.6 Gunnar in the Snake Pit. The Power of Music

Nancy Thym

The *harpa* (a lyre or harp) is mentioned frequently in the Nordic Sagas, but none seem to have moved its listeners as deeply as the story of “Gunnar in the Snake Pit” from the *Völsung saga*. Depictions of Gunnar, his hands bound, playing the lyre or harp with his feet, appear more frequently in medieval Norwegian iconography than musical motifs from any other saga.

The *Völsung saga* tells a tale of vengeance and greed, treachery and betrayal, in which two royal families, the Völsungs and the Gjukungs, are completely destroyed. It relates the life of Sigurd the Dragonslayer with his mighty sword Gram, forged by the smith Regin from the pieces of his father’s shattered sword and goes on to tell of Sigurd’s death at the hands of his wife’s royal brothers and their end at the court of her new husband, Atli king of the Huns, who wished to retrieve the dragon’s treasure horde. When Gunnar remained the last person alive who knew its hiding place and still refused to reveal the secret, Atli had him thrown into a snake pit. Knowing that Gunnar could calm wild beasts with his harp playing, Atli wisely had his hands bound so that he could not play. However, Gudrun had a harp sent to him, and so proficient was he, that he could play the harp with his toes better than some with their hands. He lulled the snakes so that they did not attack him, but finally one large adder bit him in the heart.

The *Völsung saga*, probably written down in the 13th century, is the Nordic version of the South-Germanic *Nibelungenlied*. Indeed, the Gjukungs are also called the Niflungs. Parts of the *Völsung saga* are also contained in the *Poetic* or *Elder Edda* (9th-12th centuries) and the *Prose* or *Younger Edda* by Snorri Sturluson (13th century) as well as other medieval sources. The story of “Gunnar in the Snake Pit” is conveyed slightly differently in each of the poems in the *Poetic Edda*. In the *Atlakviða* Gunnar plays the harp angrily with his hands. The *Dráp Niflunga* does not state whether Gunnar played with his hands or feet, just that he struck the harp and put the snakes to sleep, but one adder bit him in the liver. Women wept, men lamented and rafters burst when Gunnar played with his feet in the story as

given in the *Atlamál*. Perhaps the most touching of all the versions is that rendered in the *Oddrúnargrátr*, “Oddrun’s Lament”. Oddrun was Atli’s sister and deeply in love with Gunnar, much against Atli’s will. Before the battle between the Huns and the Gjukungs, Oddrun went to the other side of the fjord to help with a feast. While serving she heard the sound of the harp across the fjord, the golden strings calling out sorrowfully for her help. She sailed as fast as she could across the fjord, but arrived only to see Atli’s mother, in the guise of a deadly serpent, bite deep into Gunnar’s heart.

The motif of the harp or lyre player who is so gifted that his playing calms wild beasts and soothes the sore at heart is common throughout Europe. In biblical times David calmed the raging Saul with his music, and the Greek Orpheus could tame wild animals. The story of Orpheus was known in the Nordic areas, and was reworked into the medieval romance *Sir Orfeo*, in which King Orfeo successfully rescues his wife from the Realm of Faerie, and into the ballad *King Orfeo*, which was sung on the Shetland Islands. The Shetlands are strongly Scandinavian, and the ballad has a Norse refrain. In the medieval Scandinavian ballad *Harpans Kraft*, Herr Peder also has the power to calm the beasts with his playing and eventually overcomes the evil water spirit, forcing him to return Peder’s bride from the depths of the river.

There are many medieval depictions of Gunnar in the Snake Pit, his hands tied, playing the lyre or harp with his toes. The most famous and possibly the oldest of these (ca. 1200) is the Hylestad stave church portal from Setesdal, Norway (Figs. 1-2). The entire portal is decorated with scenes from the *Völsung saga*: the smith Regin forges the sword Gram for Sigurd; Sigurd tests the sword Gram; Sigurd slays the dragon Fafnir; Sigurd puts his fingers in his mouth after burning them on the roasting dragon heart and gains the ability to understand the language of the birds; Sigurd slays Regin the smith; Gunnar lies on his back with his hands bound, playing the lyre with his feet. A similar portal is that from Austad stave church, also from Setesdal. It shows two scenes: Högni’s heart

being cut out and Gunnar playing the lyre with his feet. Two 13th - to 14th-century portals, one from the stave church at Uvdal in Numedal, Norway (Fig. 3), and one from a farm house in Numedal, show Gunnar with a harp. At first sight, it looks as if he were standing on the harp but, in reality, he is playing with his feet, the harp below him. On a 13th-century bench originally from Heddal stave church in Telemark, Gunnar is playing a lyre with his feet in the same position. He is also depicted on two 12th-century baptismal fonts in areas of Sweden that were formerly under Norwegian rule. The stone font from Norum, Bohuslän, shows Gunnar with a lyre at his feet, similar in position to that on the Uvdal portal and the Heddal bench. On an intricately carved wooden font from Näs in Jamtland, Gunnar is seated and playing a harp with his feet, snakes twining around him and through the strings.

But why is an obviously pagan figure shown in a Christian context? The process of Christianisation in Norway was slow and comparatively late and the stave churches mark the beginning of

Christianity in Norway. Pagan motifs, including Odin with one blind eye, are common on the portals and at the tops of the staves of Norwegian churches. It is possible that these figures served a protective or apotropaic function - to ward off evil. King David is frequently shown with either a lyre or a harp in medieval iconography. Both Gunnar and King David had the ability to calm that which was raging and wild in order to protect themselves and others with their music. Gunnar was a king and is often depicted wearing a crown (Fig. 4). If it were not for the harp or lyre at his feet instead of in his hands, he could be mistaken for King David. Just as Gunnar is pierced to the heart by a snake, so does Saul nearly pierce David with his spear. Perhaps Gunnar represents an allegory for King David in the context of the churches – a figure to which the common people could relate, with the power to protect and to ward off evil. In any case, the carvings of Gunnar with his lyre or harp in the snake pit represent some of the earliest depictions of the power of music in Nordic iconography.



Fig. 1 Portal of the Hylestad stave church (ca. 1200) with scenes from the *Völsung saga*. Originally from Setesdal, Norway. Oslo, Kulturhistorisk museum.



Fig. 2 Detail of Gunnar in the Snake Pit from the Hylestad portal.



Fig. 3 Portal of the Uvdal stave church in Uvdal, Numedal, Norway (13th - 14th century).



Fig. 4 Detail of Gunnar playing the harp with his feet from the portal of the Uvdal stave church in Uvdal, Numedal, Norway (13th-14th century).



Multimediality

6.1 Creating a “Soundgate” for EMAP

Rupert Till

Most of music archaeology is either about visually presenting remains of ancient music cultures or about approaching ancient sounds by reconstructing replicas. It is a special challenge to integrate both auditory and visual aspects within a single experience, and it was only in recent years that the technology was developed to achieve this. For the EMAP exhibition, an especially ambitious project was developed by the University of Huddersfield and the Royal Conservatoire of Scotland, a kind of audio-visual time machine, which was called, with allusion to popular fiction, a “Soundgate”. Rather than being played in isolation, musical instruments are always surrounded by a complex environment, a world of references, context and surroundings that help us to understand how they may have related to the culture in which they developed. Hearing instruments in these environments help us to appreciate their power and significance, as well as what it might have been like to hear them in the past.

In order to help visitors experience these instruments in the right surroundings a visual and acoustic world was reconstructed, creating a space that resonates with re-enchanted meanings. The sound of a bone flute becomes very different when heard sustained by the long reverberation of a cave. The tiny, simple instrument is also more grand and powerful when seen alongside the dramatic paintings made in the same era. The eerie cave backdrop provides a dark contrast to the pure tones.

Caves that were frequented in the Stone Age are difficult to access, and not everyone will get to hear music being played inside. Having recorded the experience of being there, visitors to the ‘Soundgate’ can have some understanding of what these instruments sounded like in their original context. Alongside such sounds, four video projectors project a visual context, and create a surrounding, immersive environment, which wraps you up and draws you in to its virtual world.

In some cases the Soundgate audio and video teams accompanied musicians and reconstructed instruments to

archaeological sites. Many archaeological sites – for example stone circles such as Stonehenge in England, or Calanais in Scotland – have interesting acoustic properties, such as echoes. Noises made by people make these giant structures behave like the resonators of musical instruments when sounds are made inside. Ritual architecture is often created in dramatic settings, such as at Ale's Stones in Sweden, where a set of ancient standing stones are set out in the shape of a Scandinavian longboat, perched on the edge of a cliff, looking out to sea. Ancient musical instruments from this region have been reconstructed and are shown in the Soundgate being played here, where the wind and rain add a drama to sight and sound.

Some of these special sites are no longer readily accessible to the public, most have changed in many ways since the past, and whole sections have fallen down or been removed, changing the way they look and sound. Where necessary, computer software enables us to recreate an impression of such lost spaces as they appeared when they were newly built. Greek and Roman wind instruments such as doublepipes (*aulós* or *tibia*) or the *lituus* are understood differently if heard and seen within the digitally replicated grandeur of a Roman theatre. Roman culture was complex and well developed, and it is fascinating to see and hear what it might be like to be in these spaces.

In such cases, we cannot be sure that this is what a ritual would have been like at these sites, but we have tried to ensure there is nothing present that we know to be incorrect. In this sense any such effort is a creative artwork (rather than trying to be an exact visual representation in every way), a contemporary reimagining of a past world, the creation of a group of digital artists in collaboration with music archaeologists and performers, using the latest technology to offer a suggestion of how it might have felt for our ancestors to be listening to music, to help us to connect their past with our own lives today.



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J. Laurentius (3.3: Fig. 1)
J. Lipták (1.2: Fig. 4)
L. Hamon (1.2: Fig. 5)
M. López-Bertran and Agnès Garcia-Ventura (3.5: Fig. 1)
C. S. Lund (1.5: Fig. 2; 4.1: Fig. 3)
F. Marano (1.4: Fig. 3; 2.3: Fig. 1; 2.8: Fig. 2 ; 3.6: Figs. 3b, 9, 10)
B. Marshall. (4.3: Fig. 3a-b)
J. Norderäng (1.7: Fig. 1)
G. Patrikianos (2.1: Fig. 5)
L. Pickering (4.6: Fig. 7)
J. Purser (4.6: Fig. 4)
J.-L. Ringot (1,2, box: Figs. 1, 2, 3, 4, 5)
A. Sáez Romero and J.M. Gutiérrez López (2.6: Figs. 1, 2)
K. Sanger (4.6: Fig. 2)
P. Scardina (1.5: Fig. 4; 2.11: Figs. 1, 2; 2.14: Fig. 1; 3.6: Figs. 3a, 4, 5)
P. Sellmann (4.1: Fig. 4)
A. Tanboer (1.10: Figs. 1, 2, 3, 4, 5)
N. Thym (4.4: Fig. 3)

I. Turk (1.2: Fig. 1a-c)
R. Till (1.3: Fig. 2; 6.1: Fig. 1)
Th. Viehrig (4.4: Fig. 4b)
J. Vogel (5.4: Fig. 1)
A. Watson (1.3: Fig.1a-b)

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F. Bau (2.4: Fig. 1)
L. Bolander (4.1: Fig. 6)
A. Kvåle Rue (4.2: Fig. 6)

Credits for Images from Publications:

Baldellou Martínez, P. Ayuso, A. Paniaud, y M^a J. Calvo, . *Las pinturas rupestres de la partida de Muriecho (Colungo y Bárcabo, Huesca)*, in *Bolskan* 17, (2000), Fig. 8 (1.4: Fig. 5a-b)

S. Bianco, *Enotria, processi formativi e comunità locali La Necropoli di Guardia Perticara*, Lagonegro 2011, 46 (2.13: Fig. 4)

S. N. Bibikov, *A Stone-Age Orchestra*, in *The UNESCO Courier*, XVIII, 6 (June1975), 68, Fig. 38 (1.6: Fig. 5)

D. Castaldo, *Temi di archeologia musicale in Etruria Padana*, in *La musica in Etruria*, Tarquinia 2010, 54, Fig. 1 (2.13: Fig. 1)

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G. E. Cortese, A. Del Lucchese, P. Garibaldi, *Charonia sp., uno strumento musicale del Neolitico?*, in *Presitoria Alpina* 40 (2004), 93, fig.2. (1.9: Fig. 1)

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J. Jelínek, *The Pictorial Encyclopedia of the Evolution of Man*, London 1976, 44 (1.6: Fig. 3)

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I. G. Pidoplichko, *Pozdnepleolitieskie zhiliska iz kostej mamonta na Ukraine* (1969), front cover and verso (1.6: Fig. 2a-b); 97, Fig. 31 (1.6: Fig. 4)



Comune di Tarquinia

