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FILIPPO BONANNI'S *GABINETTO ARMONICO* AND THE ANTIQUARIANS' WRITINGS ON MUSICAL INSTRUMENTS

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Filippo Bonanni (1638–1725).
From *Giornale de' letterati d'Italia* (1726), p. 361.

Filippo Bonanni's *Gabinetto armonico* was first published in Rome at Giorgio Placho in 1722, reissued there in 1723, and in its new edition, "riveduta, corretta ed accresciuta dall'abbate Giacinto Ceruti", with a French translation included along a reduced version of the original commentary, published in Rome at Venanzio Monaldini in 1776. The 1723 title page claims that the treatise was "di nuovo corretto ed accresciuto", but this is not the case as the text is identical to the 1722 edition. The new title page might have been simply a commercial device to invite the purchase of the book.¹

Gabinetto armonico examines all types of musical instruments including instruments of ancient Rome, contemporaneous instruments of cultivated Europe, folk instruments, musical toys, and hunting calls. The book is particularly rich in information about non-European musical instruments: Bonanni quotes writings by travellers from the sixteenth to the eighteenth century, throwing light on a great number of sources about the music of Africa, Turkey, Persia, China, Java, and North and South America.² His approach to antiquity reveals also a deep knowledge of the works published by antiquarians from the sixteenth to the eighteenth century.³

Bonanni wrote *Gabinetto armonico* during the time when he was curator of the Museo del Collegio Romano,⁴ established in 1651 when the Roman Jesuits inherited Alfonso Donnini's important collection of antiquities. Museum's first curator was Athanasius Kircher, and the museum was therefore named Museo Kircheriano. Kircher died in 1680, and Bonanni eventually became the new curator in 1698.⁵ In the introduction (*proemio*) of *Gabinetto armonico* Bonanni pointed out that he was inspired for writing the treatise by the automatic organ and the *cimbalo verticale* connected to android figures, animals, and other musical machines that set out mythological, biblical, and amusing scenes in a "camera contigua all'erudito Museo del Collegio Romano".⁶

Gabinetto armonico is composed of a *proemio*, thirteen preliminary chapters, and a detailed description of musical instruments. The preliminary chapters deal with Jewish instruments and with the methodological issues that the study of historical instruments involves. Then the book moves on to discuss music in ancient sacrifices, feasts, parades, banquets, navigations, funerals, wars, and finally music in Christian (Catholic) context.⁷ The section detailing instruments is divided into parts about winds, strings, and percussions, with individual chapters describing each instrument. *Gabinetto armonico* is particularly famous for its engravings of instruments made by the Flemish artist Arnold van Westerhout (1651–1725).⁸ Each illustration portrays a musician inside a frame, with a background hinting at a landscape, an interior of a palace, a church, or a monastery.

Bonanni considered images to be an important means for conveying knowledge and pictures, in his opinion, were essential in a book on musical instruments. In chapter II he explained the difficulties of studying musical instruments of the past, particularly when knowing only their names it is unclear whether or not

instruments have similarities with contemporaneous ones. In order to avoid listing of unidentified instruments, he included in the treatise only those which he was able to illustrate with their images based on ancient reliefs or works by other authors.⁹ His interest in antiques may be recognized not only in his attention to Jewish instruments and instruments of ancient Rome, but as a quite general concern.

Bonanni and the other scholars of the time studying Jewish and Roman instruments were inclined to reinvent elements which they were not able to explain, sometime misleadingly retracing instrument's origin to Jewish, Latin, or Greek cultures. Occasionally they attempted to establish the continuity between instruments described in ancient literature or illustrated in archaeological findings with contemporaneous instruments, and when not finding any Latin literary quotation containing the name in question assumed that the instrument was modern. For example, in chapter XXI, Bonanni described the flute used by German soldiers; he explained its shape and its military usage, concluding that the instrument may be held on the player's right or left. He supported this argument by quoting lines from Johannes Rosinus's *Romanarum antiquitatum* explaining the difference between the *tibia dextera* and the *tibia sinistra*, forgetting that Rosinus's remarks about pipes of *tibiae* could not be applied on the flute.¹⁰ About the *serpentone*, he explained that since the instrument was not mentioned by any ancient author, it must have been designed in modern times.¹¹

Three works on music instruments of antiquity were published before the first Bonanni's edition of 1722: Caspar Bartholin's *De tibiis veterum et earum antiquo usu* (1677, 1679) and Benedetto Bacchini's *De sistrorum figuris ac differentia* (1691, 1696, 1697) were well known, particularly the first work which was frequently quoted in the literature. Friedrich Adolph Lampe's *De cymbalis veterum* (1703), however, did not have wide circulation and Bonanni mentioned that he was unable to get its copy until after he had written the majority of his text on cymbals.¹² Many other antiquarians dealt with musical instruments within works not specifically on music.

It is important here to introduce also Francesco Bianchini (1662-1729) who was writing about instruments just a few years before Bonanni, although his treatise *De tribus generibus instrumentorum musicae veterum organicae dissertatio* was published posthumously in 1742, and then in 1746 was included in the second volume of Michel-Ange de La Chausse's *Romanum museum sive thesaurus eruditae antiquitatis*.¹³ The preface and Giuseppe Bianchini's *approbatio* in the 1742 edition explain that the text of the treatise came from a manuscript found by Antonio Borioni and that the plates are copies of Bianchini's drawings.¹⁴ Elena Previdi has recently studied three manuscript versions of *De tribus generibus instrumentorum* preserved in Verona (Biblioteca del Capitolo Canonico), Bologna (Museo Internazionale e Biblioteca della Musica), and Roma (Biblioteca Vallicelliana).¹⁵ In her article she explains the circumstances in which Francesco Bianchini wrote the treatise and examines the changes that his nephew, Giuseppe Bianchini, made for the printing. The treatise was commissioned by pope Clemente XI and Previdi argues that it was written by Francesco Bianchini during the years between 1703, when he was named "presidente delle antichità di Roma", and 1712 when he began a series of trips to France, Alsace, Belgium, Holland and England.

Bonanni was quite accurate in quoting his sources but he never mentioned Bianchini's text, what would indicate that they worked independently. Writing about same instruments, the two authors often quoted the same sources what is not surprising as both worked in Rome and were part of the same cultural milieu. There are a few things that seem to suggest that they influenced each other, but this in my opinion was an outcome of the two men having the same cultural background. For example, both authors quoted Kircher's description of *zylorganum* (a series of suspended bars struck by a stick) and both say that they believe that the correct name is not *zylorganum*, but *xylorganum*, in Italian *xilorgano*.¹⁶ It is also interesting to note that both authors described in the same way the "cymbal of the Armenians", an instrument made of a metal disc with many pellet bells on its circumference with a long handle. In *Gabinetto armonico* Bonanni explained its shape and its use during the Catholic service. However, he did not mention that he had already written about this instrument in his earlier work *La gerarchia ecclesiastica*,¹⁷ where he described it as a fan with pellet bells, often used in Armenian religious rituals. Bianchini briefly described this instrument considering it to be a kind of ancient cymbal or *tympanum*. Finally, they both dealt with a small hammer, used as noisemaker. Bianchini described it in the same paragraph where he illustrated the ancient *crotala*, saying that a wooden hammer is used to call people to matins and as a noisemaker for *officia tenebrarum* during Holy Week.¹⁸ Bonanni illus-

trated noisemakers in a very detailed way, and a hammer similar to the one engraved in Bianchini's plate VII is found in plates CXVII and CXVIII of *Gabinetto armonico*. These plates illustrate the chapters devoted to noisemakers, including wooden hammers, used by children during the liturgy of Christ's Passion.¹⁹

Apart from these similarities, the two treatises each have significant differences due to the fact that one is in Latin and the other in Italian, and also they have different perspectives. *Gabinetto armonico* deals with musical instruments of the past and of the present, and from different countries. Bianchini is more interested in Jewish, Greek, and Latin cultures. The contemporaneous instruments that he described are considered related to classical or Jewish antiquity. Moreover, concerning the instruments of antiquity, Bianchini is more systematic than Bonanni. For example, Bianchini gives us more information about *tibiae*, he explained the different kinds of *tibiae* that the antiquarians had recognized (*calamus pastoralis, ossea tibia, buxea tibia, aerea tibia, tibia phrygia Matris Deum, tibiae longae et spondiaca, tibiae pares, tibiae paxillis instructae, tibiae bifores, tibiae geminae, tibiae utriculares*), while Bonanni wrote on *tibiae* only what he considered useful for his chapters on ancient trumpets, on "flauto" and "flauto doppio". Finally, about Jewish instruments Bonanni took his informations only from Kircher's *Musurgia universalis*, while Bianchini also mentioned Augustin Calmet's *Dissertation sur les instruments de musique des Hébreux*.²⁰

JEWISH INSTRUMENTS

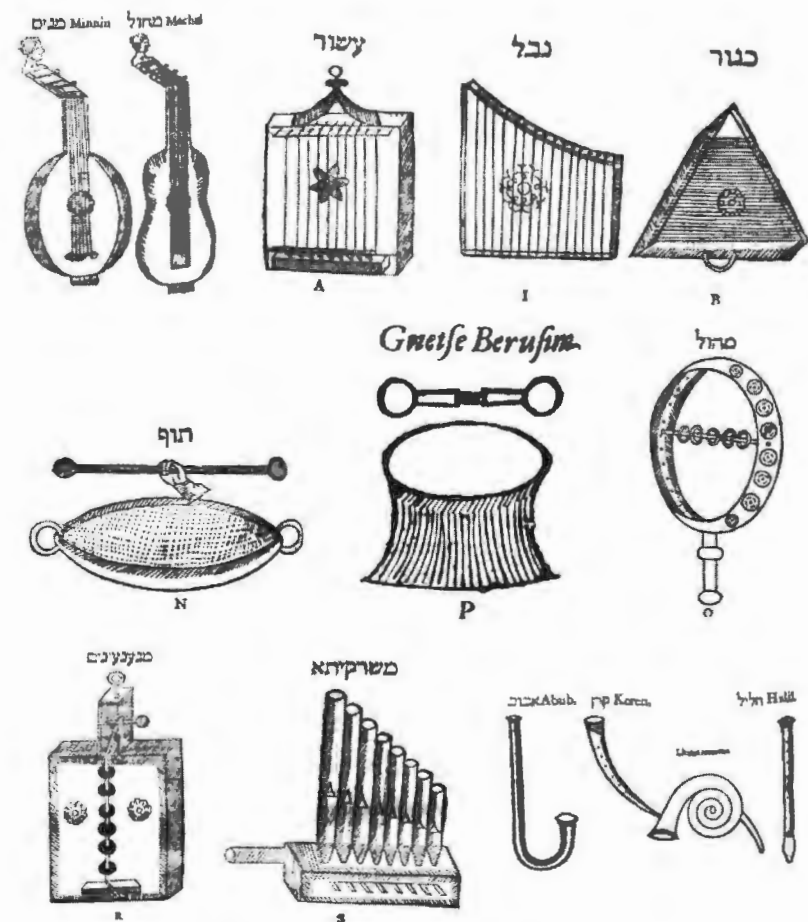
Bonanni's information on Jewish instruments in *capo I (Della varietà degl'istromenti musicali usati nel tempio, e difficoltà nel poterli descrivere)* came from Kircher's *Musurgia universalis*,²¹ who in turn used as his source an encyclopedic work *Shiltei ha-gibborim* (שילטי הגבורים) by Abraham Portaleone (1542-1612), published in Mantua in 1612.²² Kircher cited Portaleone as "Rabbi Hannase" or "Hannose" because "he had mistakenly read the adjective ha-nissa (= honoured) on the frontispice as author name".²³ Since Bonanni had not read Portaleone's work, he sometimes cited *Shiltei ha-gibborim* and names of instruments as if they were names of authors (for example, "Rabbi Shilte Hagibborim", "R. Assur", "R. Kinnor", "R. Machul", and "R. Minnin").

The comparison between texts by Bonanni, Kircher, and Portaleone that follows here will illustrate where Bonanni's information on Jewish instruments came from.²⁴ A few references of the actual interpretation of the Jewish names of instruments have been added in order to demonstrate the cultural distance that divides us from the seventeenth- and eighteenth-century scholars.

Bonanni begun his text on ancient Jewish instruments with identifying David's psaltery: he mentioned opinions of different authors, concluding that the most common one is that David's psaltery, called a *nablium*, was similar to a harp. He then mentioned Kircher's pictures of string instruments (called respectively *psalterium, cinnor, machul, minnim*, and *nevel* [figs. 1 & 2]), which Kircher in turn took from a Vatican manuscript.²⁵ All other pictures in the *Musurgia universalis* are an attempt to illustrate descriptions of instruments that have no illustrations in *Shiltei ha-gibborim*.

The Jewish *tympanum* Bonanni called *toph* and said that it looks like a boat, with one membrane, and it is struck by an iron or wooden striker. Kircher's picture of the instrument illustrates a kind of frame drum viewed sideways, resembling in shape a small boat, and a double-headed striker [fig. 3]. The *Shiltei ha-gibborim* explains the word *tôf* as if it has the same meaning as "cymbals", and that its equivalents in the Greek is *kymbalom* and in the Latin *cymbalum*. It adds that these instruments, made of metal, look like small boats (perhaps the similarity is suggested by the fact that the Greek word *kymba* and the Latin *cymba* mean boat), and they were used by Egyptian priests devoted to the "mother of all gods".²⁶ Kircher claimed that his description of the *thoph*, as an instrument made of a membrane stretched on a frame, comes from Portaleone.²⁷ Effectively at the end of his description, after having said twice that the *tôf* is made of metal, Portaleone added the opinion of his Master who claimed that a *tôf* could also be a kind of membrane on a wooden resonator. Contemporary scholars agree that *tôf* means frame drum.²⁸

Gnetse berusim is described in *Shiltei ha-gibborim*, as well as by Kircher and Bonanni, as a pot struck by a striker, similar to a mortar and pestle. Portaleone writes that it is called *krotalon* in Greek, *krotalum* in Latin,



From the top left: 1. Minnin, machul – 2. Three psalteries – 3. Toph – 4. Gnetse berusim – 5. Machul – 6. Minagngghinim – 7. Masrakitha – 8. Abub, keren, lituus retortus, halil. Athanasius Kircher, *Musurgia universalis* (Rome, 1650), vol. I, libr. II, cap. IV, 48-54.

and *naccare* in a "foreign language" [fig. 4].²⁹ Joachim Braun says that the word 'asei beroshim in the second book of Samuel (6:5) refers to wooden instruments, maybe clappers.³⁰ However, analyzing this passage along with a similar one from the first book of Chronicles (13:8) in their Hebrew versions, together with the Vulgate and the Septuagint translations, Jeremy Montagu argues that no particular musical instrument can be recognized from the word 'asei beroshim.³¹

Writing about *machul* Bonanni explained that certain authors considered it to be a sistrum, and other a string instrument or a kind of rattle made of a ring with small bells. Kircher first described *machul* as a string instrument, similar to a guitar [fig. 1].³² He then quoted *Shiltei ha-gibborim* arguing that it is a ring with many small bells around the circumference. Portaleone said that it is called *systros* or *krousma* in Greek, *tintinnabulum* in Latin, and *circolo campanellato* in the "foreign language". His description of the *machul* effectively mixes together features of the frame drum, the rattle made of a ring with bells or concussion jingles, and the sistrum. The description of the shape of the *machul* in *Shiltei ha-gibborim* seems to refer to a ring with bells. However, the allusion that the instrument is played by female folk musicians reminds us of the frame drum played by Italian peasant women. Finally, a reference to Egyptian priests devoted to Isis seems to allude to the sistrum.³³ Kircher's picture reproduces Portaleone's overlappings. Kircher wrote that the Egyptian sistrum is a quite different instrument and that the *Shiltei ha-gibborim* description of *machul* resembles the *thoph* [fig. 5].



9. "Tromba antica Ebrea". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate I. – 10. "Sacerdote Hebreo". Filippo Bonanni, *La gerarchia ecclesiastica* (Rome, 1720), plate 2.

Contemporary organologists including Jeremy Montagu argue that the word *mâchôl* is difficult to interpret and it may refer to both a musical instrument or to a dance, depending when the texts were written. Montagu adds that if it really is an instrument, it would be a wind instrument, because it has the syllable *chôl*, meaning hollow or pierced, and it is often coupled with *tôf*.³⁴

Bonanni's description of *minagngghinim*, based on Kircher's translation of *Shiltei ha-gibborim*, says that the instrument looks like a wooden board with a handle that is struck by small wooden balls when it is shaken [fig. 6]. Portaleone wrote that the Greek name of the instrument is *diaseio*, and went on to say that there is no Latin name for it *per se*, so it will be called *sistrum* or *crepitaculum*. He also discussed the hypothesis that the instrument was invented by Archita Tarentino and was used by children as a toy. In the "foreign language", he called it by the name *battisterii*.³⁵ Montagu claims that there is no evidence to show the existence of the sistrum in biblical times, and agrees with Bathja Bayer and Joachim Braun that the instrument was a rattle (as the derivative of the word meaning tremble, vibrate, or shake), probably made of pottery.³⁶

Another instrument that Bonanni briefly mentioned is *magraphe tamid*, whose sound is described audible from Jerusalem to Jericho. The instrument was kept in the Temple and was used to call people to prayer. He said that nobody knew its shape and Kircher did not provide a picture for it. *Shiltei ha-gibborim* suggests that the instrument was made of metal and had a semicircular shape.³⁷

In *Shiltei ha-gibborim*, the *masrakita* is described as a panpipe, made of reeds, and closed at the bottom by a wooden stop, wrapped by a leather covering. Its Hebrew name reflects similarity to a comb; its Greek name is *syrix*, the Latin *fistula*, and the "foreign name" *siringa*. This interpretation is not too far from the modern one: Montagu observes that the name *mashrôqîta* derived from the verb *shâraq* meaning hiss or whistle, which may also be the etymological origin of the Greek *syrix*.³⁸ Portaleone also described the way of playing the instrument, saying that it has to be placed near the lower lip in order to direct the breath to the pipes.³⁹ Kircher's text describes the *masrakita* as an instrument which has pipes inserted in a wooden case with a mouthpiece, and it is played by opening and closing the holes in the pipes. His drawing of the instrument is quite odd, as it shows a series of organ pipes inserted in a case with a mouthpiece on a side. It is unknown if Kircher misinterpreted the original Hebrew text or intentionally modified Portaleone's description [fig. 7]. Bonanni provided a brief translation of Kircher's Latin text on *masrakita*, then moved on to the subject of *fistulae* and *litui Hebraeorum*.

For *fistulae* and *litui*, Kircher provided a picture representing four instruments: the *abub* resembling a crumhorn even if it lacks the finger holes, the *heren* similar to an upside-down *cornetto*, the *lituus retortus* resembling a small spiral horn, and the *halil* which is a recorder. The beginning of Kircher's text on the three kinds of Jewish *fistulae* is similar to the description of the three kinds of *chalîlîm* in *Shiltei ha-gibborim*, but later text differs. The drawing of instruments also derived from the *Shiltei ha-gibborim* although it shows them upside-down [fig. 8]. In fact, the *qeren* in *Shiltei ha-gibborim* is described as a *cornetto*, the *piffero* (called *abub* in the picture) is described as a bent reed instrument, and the *flauto* (*halil* in Kircher's picture) is described as a duct flute.⁴⁰

Beside these instruments, described in the first preliminary chapter and in *capo I* entitled "Della Varietà degl'Istromenti Musicali usati nel Tempio, e difficoltà nel poterli descrivere" and for which Bonanni did not provide pictures,⁴¹ the only Jewish instruments included in the section of the treatise with detailed descriptions and pictures of musical instruments is the "tromba antica Ebraea", in the first chapter. It is described in Numbers 10, 2 as the metal trumpet made of hammered silver that God ordered Moses to create. Bonanni quoted Josephus Flavius's description of the trumpet and also incorrectly applied Jacob Guther's observations on the different kinds of *tibiae* to the Jewish trumpet. Plate I shows a Jewish priest with a straight trumpet [fig. 9]; the same priest may be shown in plate 16 of Bonanni's *Gerarchia ecclesiastica* [fig. 10]. In the last lines of chapter I, Bonanni mentioned some Roman marble reliefs and coins, as well as Vegetius's and Alfonso Chacon's descriptions of the *tuba*. Therefore the reader can infer that in Bonanni's opinion the metal trumpet of the Bible was the same as the Roman *tuba*.

INSTRUMENTS OF LATIN ANTIQUITY

TIBIAE AND TUBAE. Ancient *tibiae* and *tubae* Bonanni described in chapters II, III, XIX, and XX of *Gabinetto armonico*.⁴² His most important source on ancient wind instruments was *De tibiis veterum* by the Danish physician Caspar Bartholin (1655–1738). The seventeenth- and eighteenth-century scholars lacked a modern method of the analysis of acoustical devices and ignored the ethnomusicological approach. Therefore, on the basis of literary quotations or representations in iconographic sources, *tibiae* were generally understood as flutes or trumpets. Some authors believed already in the seventeenth century that *tibiae* were reed instruments comparable to shawms.⁴³ Many antiquarians considered the *ligulae* (reeds) to be a part of the *tibicines*'s equipment although sometimes they misunderstood their function. Bartholin quoted literary descriptions of *ligulae tiliarum* in the chapter *Tibiarum forma, earumque partes*,⁴⁴ and in the chapter on *Tibiarum sonus* demonstrated how the *ligulae* influenced sound production.⁴⁵ Fortunato Scacchi, the second author quoted by Bonanni in chapters II and III, wrote that both *tibiae* and *tubae* have reeds.⁴⁶ Both Bartholin and Scacchi published their treatises in Latin, while Bonanni wrote in Italian, adding the problem of translation to the many interpretative difficulties of ancient *tibiae*. The result was Bonanni's reinvention of the ancient *tibia* on the basis of the sources that he considered interesting, in a combination with his desire to establish a continuity between instruments of antiquity and those of modern times.



11. "Tromba Romana antica". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate II.

Chapter II of *Gabinetto armonico* presents a soldier wearing modern clothes, and playing a straight trumpet called "tromba Romana antica" [fig. 11]. Quoting Scacchi, Bonanni pointed out that this instrument is shown in the *colonna Traiana* and that musicians need reeds to play it.⁴⁷ He continues that, according to Bartholin, the instrument was usually played wearing a *capistrum*, pictures of which may be seen in *De tibiis veterum*. Finally, he tells the myth of the invention of the *aulos* by Minerva.

In chapter III Bonanni wrote again about the *capistrum* maintaining that trumpets were used in many different circumstances; he mentioned the trumpet of Moses, trumpets used during wars, feasts, sacrifices, and public announcements, and trumpets in Last Judgement. He always called these instruments "trumpets", and although he quoted some literary passages on the *tuba*, he never mentioned the name *tibia*. The engraving in chapter III (which may also be related to the text in chapter II, as it shows a musician wearing a *capistrum*) came from Bartholin's *De tibiis veterum* [figs. 12 & 13], who in turn took it from the *Museo cartaceo* of Cassiano dal Pozzo,⁴⁸ where it was copied from a relief in Campadoglio.⁴⁹

Examining Bonanni's sources it is possible to see how his arguments on ancient trumpets were formed. Fortunato Scacchi's treatise *Sacrorum elaeochrismaton myrothecia tria* describes unguent vessels and rituals in which unguents were used. Since in such rituals were employed *tibiae*, *tubae*, and *buccinae*, chapter 57 of the



12. "Tromba antica espressa nel Campidoglio". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate III. — 13. Caspar Bartholin, *De tibiis veterum* (Rome, 1677), plate II, no. 3.



treatise's third book describes the differences between *tubae* and *tibiae*, quoting literary sources such as the Bible, and Greek and Latin authors. Scacchi wrote about the structure of these instruments, their external shape, the presence or absence of holes, and the materials from which they were made. He said that reeds are used in both *tubae* and *tibiae*, and compared them to seventeenth-century wind instruments known in Italian as *piphari*.⁵⁰ However, Scacchi went on to argue that the ancient *tuba* was similar to the modern straight trumpet and the S-trumpet, which are not reed instruments, and he added that the *tibia* is similar to the shawm. This conclusion is illustrated in an engraving showing three instruments [fig. 14], which Bonanni in turn mentioned in chapter II (also copied by Bartholin⁵¹) and used as the basis for the instrument played by his "soldier" in plate II of *Gabinetto armonico* [fig. 11]. The modern appearance of the player in plate II perhaps comes from Scacchi's merging instruments of the past and present, but it may also be related to the various usages of trumpet that Bonanni mentions in chapter III.

The confusion between *tibiae* and *tubae* that Bonanni made in chapters II and III has its roots in Scacchi's and Bartholin's works. What Bonanni added is the "invention" of a double trumpet used in antiquity and played with a *capistrum*. Perhaps the two conical pipes of the player in fig. 12 created this misinterpretation. Bonanni's sources could not establish a clear distinction between the shape of *tibiae* and *tubae*. From reading *Gabinetto armonico* it seems that Bonanni claimed that conical pipes with no holes were the same as trumpets, and that cylindrical pipes with holes were the same as recorders. Many artists from the sixteenth century onwards did the same when depicting musical instruments "all'antica".



14. Fortunato Scacchi, *Sacrorum elaeochrismaton myrotecia tria* (Amsterdam, 1710), cap. LVII, col. 1101-1102.

In chapter XIX Bonanni mentioned the *tibia* for the first time, claiming that the word refers to the bones of the crane's legs from which *tibiae* were originally made. Quoting the analysis of some verses from Horace's *Poetica* by Johannes Rosinus, he made a distinction between the ancient and modern *tibia*. In order to describe the differences in length and the number of holes of different *tibiae*, he mentioned a consort of recorders and a French flageolet, showing in plate XIX of *Gabinetto armonico* a shepherd playing a recorder [fig. 15]. This image indicates that Bonanni considered *tibiae* and recorders to be the same instrument.

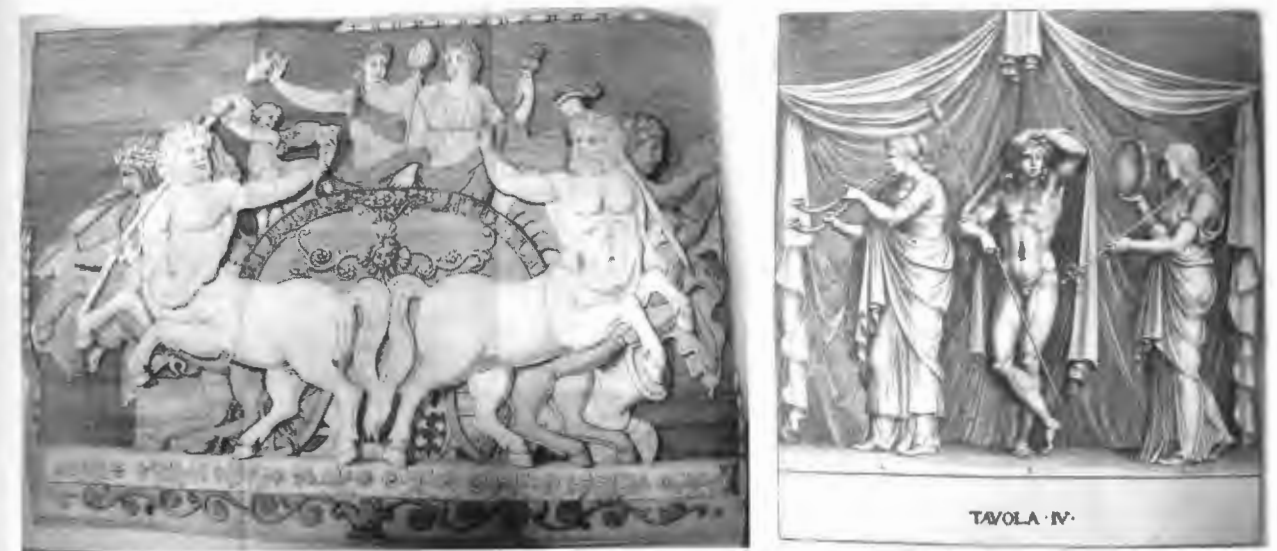
His creative use of sources can be also seen in description of *tibia*'s origin, where he mentioned the myth of Pan, even though it has no relevance in this context, but rather with the origin of the *syrinx*. He then goes on to use more relevant sources such as verses from Lucretius's *De rerum natura*, describing how the sound of the wind whistling through reeds inspired the creation of the first wind instruments. In the continuation he referred to the myth of Minerva's invention of the *tibia*, and finally mentioned two iconographical sources: Cardinal Carpegna's cameo described by Filippo Buonarroti [fig. 16],⁵² and a fresco from Rome's *grotte*, reproduced by Bartoli in *Le pitture antiche delle grotte di Roma, e del sepolcro de' Nasoni*.⁵³ These sources however illustrate double instruments (which Bonanni discussed in detail in chapter XX). Fig. 17, the fresco from Rome's *grotte*, shows *tibiae frigiae*. Bonanni pays attention to this important detail and he says that this kind of *tibiae* is bent like the *lituus* and not straight like the other *tibiae*.⁵⁴

Chapter XX concerns "flauto doppio" and its engraving shows a player "all'antica" with a laurel wreath playing a double instrument [fig. 18]. The word "flauto" seems to allude here to a recorder, even though the whistle mouthpiece is not shown in plate XX. As mentioned earlier, it was a common practice for writers and artists to refer to ancient double *tibiae* as if they were double recorders. Mersenne, for example, in the *proposition* concerning musical instruments of antiquity describes ancient *tibiae* as *flustes*.⁵⁵ In this chapter Bonanni mentioned four images included in the works of Giovanni Battista Casali, Francesco de Ficoroni, Bartholin, and Filippo Tomasini.⁵⁶ Except for the image in Ficoroni, all these instruments refer to *geminae tibiae* (i.e. *tibiae* with two pipes), corresponding with Bonanni's title "Flauto doppio" at the top of chapter XX. Casali's description of a sacrifice in which four *tuba* players and a *geminae tibiae* player are involved is accompanied by a picture of the marble relief from Cassiano dal Pozzo's *Museo cartaceo* [figs. 19 & 19a].⁵⁷



15. "Flauto". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate XIX.

In his *Osservazioni sopra l'antichità di Roma* (1709), Francesco de Ficoroni (1664–1747) described a tomb discovered in 1702 in Domenico Caballini's villa, in the vicinity of Rome.⁵⁸ He claimed that the tomb was not from the time of Constantine, as stated in Bernard de Montfaucon's *Diarium Italicum*, but from earlier times and mentioned the sarcophagus found in the tomb which had in the relief on the lid shown a musician playing a three-piped instrument ("istromento à guisa di tibia a tre ordini") [fig. 20]. Since there is no evidence of three-piped *tibiae* in ancient Rome, it is possible that Ficoroni misinterpreted a detail represented insufficiently clear. In Montfaucon's *Diarium Italicum* the discovery of the tomb is described by the bishop of Adria, Philippus a Torre,⁵⁹ and the details of the *tibiae* player do not correspond to Ficoroni's description. In Philipus a Torre's description the player is not mentioned, and the relief on the lid does not show *tibiae*, but a small conical instrument with one pipe only, more similar to a horn [fig. 21]. It is hard to say today which of these reproductions is more accurate, but the discrepancy between these two texts demonstrates how in the absence of knowledge about ancient Roman instruments, antiquarians could easily misunderstand iconography creating false evidence.



16. Cardinal Carpegna's cameo. Filippo Buonarroti, *Osservazioni istoriche sopra alcuni medaglioni antichi all'Altezza Serenissima di Cosimo III Granduca di Toscana* (Rome, 1698). — 17. *Tibiae frigiae* on a fresco in Rome's grotte. Giovan Pietro Bellori, Pietro Santi Bartoli, and Michel-Ange de La Chausse, *Le pitture antiche delle grotte di Roma, e del sepolcro de' Nasonj* (Rome, 1706), plate IV.



18. "Flauto doppio". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate XX.



19. Giovanni Battista Casali, *De urbis ac Romani olim imperii splendore* (Rome, 1650), 367.



19a. Detail of *tibiae* player shown in fig. 19. — 20. Francesco Ficoroni, *Osservazioni di Francesco de' Ficoroni sopra l'antichità di Roma* (Rome, 1709), 57. The *tibia* player is shown on the lid second from the right.

Bonanni's third source, Bartholin, differs greatly from Casali and Ficoroni on the subject of the shape of the *tibia*. According to him the two pipes were connected by a mouthpiece and he documented this with the *geminae tibiae* taken from Boissard's *Secunda pars antiquitatum romanarum seu topographia romanae urbis* [fig. 22],⁶⁰ where the instrument is played by a female musician in a Priapo sacrifice [fig. 23].⁶¹

The last iconographic source mentioned by Bonanni is a marble representing a Silvano sacrifice illustrated by Filippo Tomasini.⁶² It shows a double-pipe instrument in which the two pipes do not have a common mouthpiece [fig. 24].⁶³ Bonanni's method in studying ancient *tibiae* was different from Bartholin's or Bianchini's, since he made a direct translation from Latin to Italian and compared ancient instruments with



21. Bernard de Montfaucon, *Diarium Italicum* (Paris, 1702), 451.

modern ones, as if they were one and the same. He was not interested in explaining the various kinds of *tibiae* that the other two scholars mentioned, or the differences between the two pipes. He simply focused on a few images and literary quotations that prove the existence of the instrument in the past.

CORNU AND LITUUS. With the *cornu* and *lituus* Bonanni dealt in chapters VII, VIII, and XI, and represented *cornu* in plates VII and VIII: the first shows a musician wearing a lion skin and playing an instrument without a bar [fig. 25], the second is a laurel-crowned player holding an instrument with a transverse bar [fig. 26]. Chapter VII begins with a series of quotations from the Old Testament referring to the use of bent trumpets.

Being probably unaware of the *šofar*, Bonanni mentioned Moses's trumpet as the only Jewish trumpet. Therefore, he also doubted the existence of horns in ancient times. Chapter 56 of Fortunato Scacchi's *Sacrorum elaeo-chrismaton myrotecia tria* is Bonanni's primary source for chapter VII. Both Bonanni and Scacchi mix passages from the Bible and Latin quotations in order to understand the shape of ancient bent trumpets. Unaware of the existence of horns in antiquity, the passages in the Vulgate referring to horns he understood to be alluding to such instruments as the Roman *cornu*.

He then refers to three iconographical sources: a plate showing section of the Roman army with two *cornu* players, from *Colonna Traiana* by Giovan Pietro Bellori with the engravings of Pietro Santo Bartoli [fig. 27];⁶⁴ plate III from Bartholin's *De tibiis veterum* which is based on the *Colonna Traiana* [fig. 28]; and an engraving of three *cornu* players from Giusto Lipsio's *De militia romana* [fig. 29]. The player on plate VII of *Gabinetto armonico* [fig. 25] may have been inspired by *Colonna Traiana*'s and Giusto Lipsio's pictures; while the player in plate VIII clearly came from an engraving in Onofrio Panvinio's *De triumpho* [fig. 30].⁶⁵ Among three *cornu* players in Lipsio's *De militia romana*, one musician has instrument that ends with a bell decorated with



22. Caspar Bartholin, *De tibiis veterum* (Rome, 1677), plate I, no. 4.



23. "Priapo sacrifice". Jean Jacques Boissard, *Secunda pars antiquitatum romanarum seu topographia Romanae Urbis* (Frankfurt am Main: Matthaeum Merianum, 1628), 45.

animal's head, similar to Bonanni's musician on plate VIII. Discussing the *cornu*, Bonanni made no distinction between the horn, trumpet, or *buccina*.⁶⁶

The *lituus* player in *Gabinetto armonico* [fig. 31] was based on the image on a headstone dedicated to Iulius Victor published both by Bellori, Bartoli, and La Chausse [fig. 32] and by Bartholin [fig. 32]. Bartholin said that the stone was "in horto domus quondam *Advocati Ronconi* e regione S. Isidori Hibernensium",⁶⁷ while Bellori and La Chausse explained that the headstone engraved by Bartoli was actually discovered in Villa Corsini.⁶⁸ The stone in *Le pitture antiche delle grotte di Roma* is different from Bartholin's because it includes a mask, a syrinx, and a goat hoof not present in *De tibiis veterum*. Bellori and La Chausse argue that it is possible that these were two different stones or the same one that had been moved.

Bonanni's information on the *lituus* also came from Raffaele Fabretti's *De columna Traiani* (1683), who describes the differences between the *cornu* and *lituus* [fig. 34].⁶⁹ Using Latin passages quoted from his sources, Bonanni described the *lituus* as the instrument of cavalry but also played during sacrifice rituals, adding that its hooked shape is the same as the augural stick and this is probably where the *lituus* came from.

The problem of interpreting wind instruments of ancient Rome still fascinates scholars.⁷⁰ The Trajan column, the funerary stones, the literary evidence (above all the famous passage in the third book of Vegetius's *Epitoma rei militaris* about the *semivocalia* calls played on the *tuba*, *cornu* and *buccina*) are still essential sources. However, new iconographic sources, new archaeological findings and the arousing of a musicological point of view have brought a deeper knowledge of the contexts in which Roman instruments are mentioned and represented.

Antiquarians were not accurate in using names and one instrument, as I has already noticed, could be named *cornu*, horn, trumpet or *buccina*. However, in my opinion, in recent time scholars have exceeded in trying to achieve a perfect correspondence between names and instruments.⁷¹



SACRVM SANCTO SILVANO AVG VOTO SVSC EX VIS

24. "Silvano sacrifice". Filippo Tomasini, *De donariis* (Leiden, Utrecht, 1699), col. 847-848.

In my opinion the most useful contribution to the interpretation of Roman wind instruments is a study by John Ziolkowski, who suggested a need to be careful with interpreting the names of instruments and of performers, even in presence of iconographical evidence. In his opinion:

Tuba was the most general name for the long straight instruments and it was applied sometimes to all the tube-like instruments, whether straight or curved. In this extension their practice was similar to the modern colloquial usage of the word "horn" to refer to almost any instrument, whereas "trumpet" or "cornet" are not so generalized. *Lituus* was the name of the augur's wand as well as the similarly shaped instrument. Since *litui* and *tubae* seem to have worked together in the army as kind of unit producing closely related sounds, the two terms were sometimes interchanged by Roman writers, especially poets. Meucci, in fact, would consider the *bucina* and *lituus* to be identical, at least in certain periods. Others (Landels and Tintori) conclude that the *bucina* was basically a *cornu*. These two words, however, referring originally to the horn of an animal, also developed distinct meanings, the latter (*cornu*) used more specifically for the G-shaped instrument and the former more generally applied to any instrument used for the work of the *bucinator*.⁷²

About the names of players (*tubicen*, *cornicen*, *buccinator*), he argues that:

these terms may simply indicate the various assignments of three different groups of brass musicians: for example, *tubicines* are those who gave the military signals; *cornicines* as those who marked the position and movements of the standards; and *bucinatores* as those who played at night and perhaps served generally as time-keepers (sounding the hours on whatever instrument they had: *tuba*, *lituus* or *cornu*).⁷³

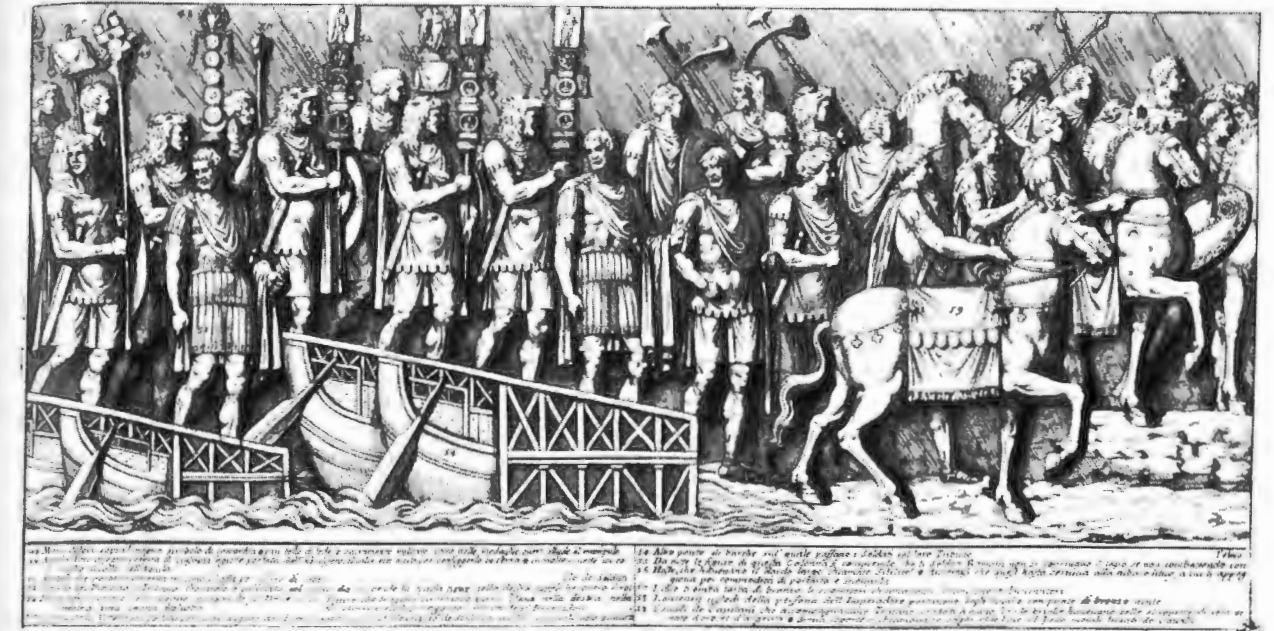


25. "Tromba curva". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate VII – 26. "Altra Tromba piegata antica". *Ibid.*, plate VIII.

THE PANPIPE. On the basis of the Italian translation of the Latin term "fistula" Bonanni called the panpipe "ciufoli pastorali". The word "ciufolo" today is still being used for some duct flutes in central Italy,⁷⁴ while the adjective "pastorali" refers to the rural connotation that panpipes usually have. Although the principal source of chapter XXII of *Gabinetto armonico* is *De tibiis veterum*, the picture of the satyr playing a panpipe does not come from Bartholin, but it can be traced back to many images related to the myth of Pan and the nymph Siringa [fig. 35].

The text in chapter XXII Bonanni obtained from Bartholin's *De tibiis veterum* and from Scacchi's *Sacrorum elaeochrismaton mirotectia tria*. His two long quotations from Achilles Tatius's *Leucippe and Cleitophon* come from *De tibiis veterum*. However, Bonanni only remarked on the passages that describe the structure of the instrument, omitting the story of Pan's invention of the *syrix* that Bartholin took from Tatius. It is interesting that Bonanni mentioned the myth of Pan in chapter XIX dealing with the instrument that he called "flauto", rather than in chapter XXII, where it would be an appropriate place. This is particularly striking because plate XXII deals with this myth, while the text of this chapter never mentions it.

By using Scacchi's arguments Bonanni tried to demonstrate that the sentence "fistulantes fistulis" in the Vulgate is referring to the panpipe, and that both the Roman instrument *fistula* and the Jewish instrument in the Vulgate also called *fistula* are the panpipe. The mere similarity of names for Bonanni seems to be a proof that the two musical instruments employed in different cultures were identical.



27. Giovan Pietro Bellori, Pietro Santi Bartoli, Alfonso Chacon, *Colonna Traiana* (Rome, s.d.), plate 5. – Two relevant captions below the picture read: "56 Haste, che havevano il dardo largo chiamate Sicilices * Avvertasi che quest' hasta serviva alla tuba o lituo a cui li appoggiava per comodità di portarla, e suonarla. 57 Lituo tromba torta di bronzo, li suonatori chiamavansi liticini, ovvero buccinatori."



28. Caspar Bartholin, *De tibiis veterum* (Rome, 1677), plate III, no. 6. The image is based on the instrument shown in *Colonna Traiana* [fig. 27].



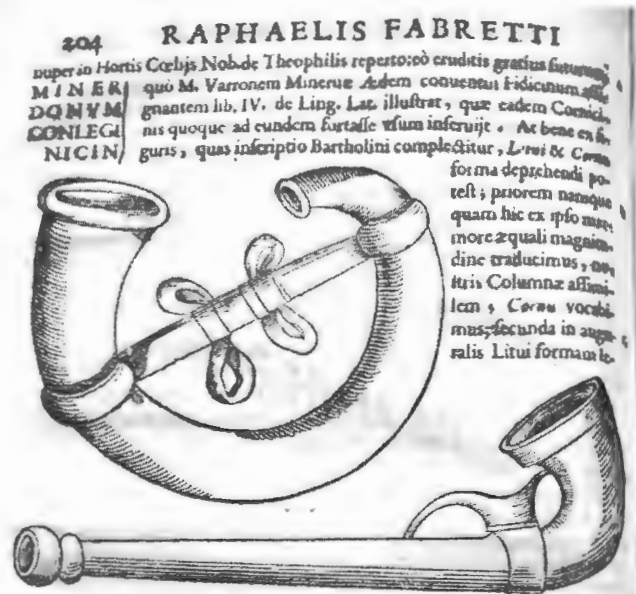
29. Giusto Lipsio, *De militia romana* (Antwerp, 1598), 202.



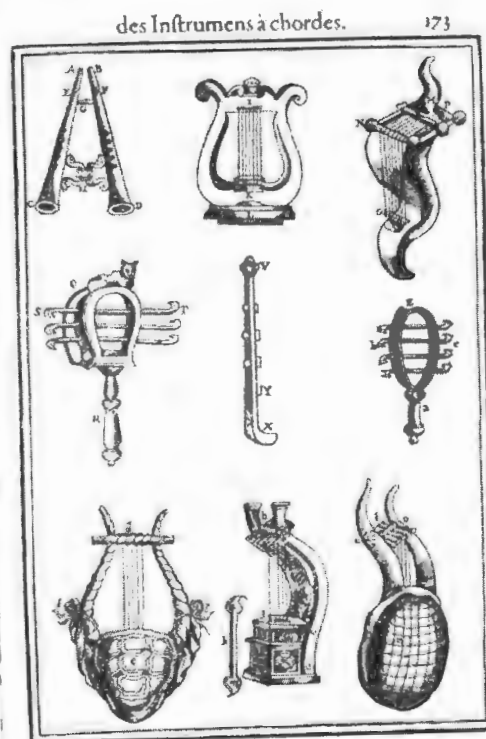
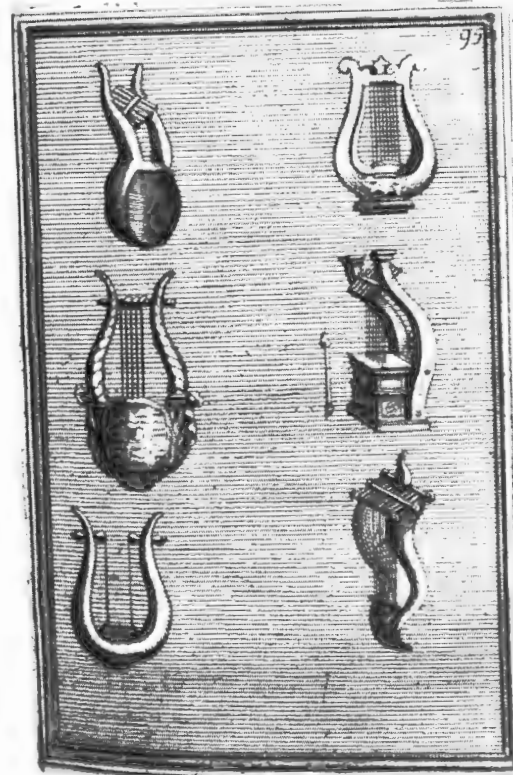
31. "Lituo degli Antichi". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate XI. — 32. Giovan Pietro Bellori, Pietro Santi Bartoli, and Michel-Ange de La Chausse, *Le pitture antiche delle grotte di Roma, e del sepolcro de' Nasonj* (Rome, 1706), plate VIII.



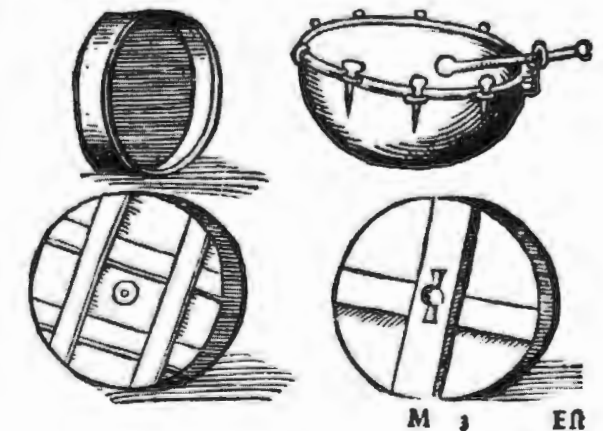
30. Onofrio Panvinio, *De triumpho* (Leiden, Utrecht, 1699), plate at the end of the volume.



33. Caspar Bartholin, *De tibiis veterum* (Rome, 1677), plate III, no. 4. — 34. Raffaele Fabretti, *De columna Traiani* (Rome, 1683), cap. VII, 204.



35. "Ciufoli pastorali". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate XXII. — 36. "Cetera". *Ibid.*, plate XLVIII. — 37. Unnumbered plate showing types of lyres. *Ibid.* — 38. Marin Mersenne, *Harmonie universelle* (Paris, 1636), vol. III, libr. III, proposition XXV, 173.



39. "Lira di Apollo". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate LII. — 40. "Timpano antico". *Ibid.*, plate LXXII. — 41. Onofrio Panvinio, *De triumpho* (Leiden; Utrecht, 1699), unnumbered plate at the end of the volume. — 42. Lorenzo Pignoria, *De servis* (Augsburg, 1613), 93.



43. "Timpano moderno". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate LXXIII.

ANCIENT LYRE AND THE MODERN CETERA. The two plates that illustrate chapter XLVIII highlight the intricacies of meanings that the Italian name *cetera* held for seventeenth- and eighteenth-century scholars: the first plate shows a modern musician playing a kind of cittern [fig. 36],⁷⁵ and the second plate is borrowed from Mersenne's *Harmonie universelle* and shows a series of lyres [figs. 37 & 38]. In this chapter Bonanni examined ancient lyres and their relationship with the modern *cetera*. He mentioned various myths connected to the lyre which in Latin is name *lyra* and *cithara*. The modern cittern is also called in Italian a *cetera*, thus compounding confusion to this already complicated matter.

The problem of the difference between *cithara* and *lyra* has been pointed out by Jules Caesar Boulenger in his *De theatro* (1603). He attempted to differentiate between the *cithara* and *lyra* by associating the two instruments with different myths or with different usages.⁷⁶ However, the difficulty with interpretation of this text and understanding whether or not the *cithara* was meant to be the modern *cetera* (cittern) lies in the fact that he wrote in Latin and did not include pictures. Mersenne said that people may think that the ancient "cithare" is actually a "guitarre",⁷⁷ while Trichet saw continuity between ancient lyres and *citara*, and about the lute that he calls *cistre*:

Non pourtant que je veuille assurer que ce soit la vraye cithare des Anciens, qui avoit plus grand nombre de cordes que l'on n'en donne au cistre françois: ainsi je me laisse volontiers emporter a l'opinion de ceux qui croient que ce soit une espece de cithare, qui retient quelque ombrage ou desguisement de l'Antiquité, d'autant que les Italiens le nomment encore aujourd'hui *citara*, lui donnant quelque-fois jusques a neuf ou dix rangs de cordes, et pour le moins six.⁷⁸

The seventeenth- and eighteenth-century hypotheses on the continuity between ancient and modern instruments reminds us of Winternitz's theory on the transformation of ancient lyres into the modern cittern.⁷⁹ He argued that the cittern's projection at the bottom of the soundboard and its shoulders are similar to the base and the arms of ancient kitharas. The necked instruments with "wings" in the Utrecht Psalter, in his opinion, present the evidence "of the transformation of the ancient kithara into an instrument with stopped strings".⁸⁰ This transformation took place before the sixth century as proves a "cittern with atrophic kithara features" on a mosaic in Qasr el-Lebia.

In the chapter on lyre, once again, Trichet tried to explain the difference between *lyra* and *cythara*. This time he dealt only with ancient instruments arguing that *cithara* is a general name that can be attributed to various instruments including lyres:

Il faut croire que la cithare comprend en sa large significations tous les instruments à cordes et que *citharista* et *citharaedus* est le nom général de ceux qui jouent non seulement de la cithare et de la lyre mais des autres instruments à cordes. [...] Par conséquent ce seroit une erreur de dire que cithare et lyre sont mesme chose, parce que la cithare comprend la lyre comme qui diroit l'eau de vie, l'eau de sauge, et l'eau de rose sont une mesme chose, parce que toutes sont comprises sous le nom d'eau; mais il vaut mieux raisonner en cette sorte, que comme l'eau se prend particulièrement pour une eau pure, simple et élémentaire, et néanmoins par excellence elle comprend les eaux artificielles, composées et alambiquées, aussi le mot de cithare en sa propre et estroite signification ne désigne qu'un seul instrument mais par prééminence il en dénote d'autres. Jules Boulenger (l. 2 de the. c. 39) a très bien reconnu la différence de la cithare et de la lyre, lorsqu'il a dict: *Poëtae lyram, citharam, citharin, testudinem et phorminga saepe pro eodem organo ponunt, sed omnino lyra et cithara diversae sunt, quia lyrae Mercurius author, citharae Apollo. Sunt tamen cognata inter se instrumenta, quae fidibus intenta pulsantur.*⁸¹

Bonanni did not explicitly state his opinion but it seems that he agreed with Trichet's distinction. Reading chapters XLVIII and LII of *Gabinetto armonico* it is possible to argue that the proper ancient lyre is the instrument with yoke and arms, as the chapter on Apollo's lyre shows [fig. 39]. The word *cetera* can be used to name different instruments, including all types of lute. Bonanni went on to say that different types of lutes evolved from the ancient lyre in various places and cultures. The continuity between the ancient and the modern, in his opinion, is shown by the presence of a resonator called *testudo*.⁸²



44–45. Filippo Buonarroti, *Osservazioni istoriche sopra alcuni medaglioni antichi all'Altezza Serenissima di Cosimo III Granduca di Toscana* (Rome, 1698), 436 (left); unnumbered plate at the end of the volume (right).



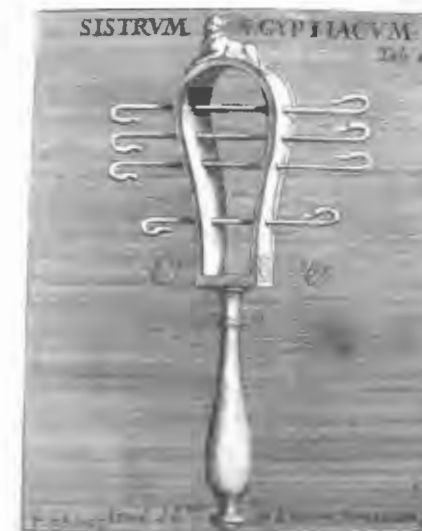
46. "Fauno". Leonardo Agostini, *Le gemme antiche figurate* (Franeker, 1699), plate 12.



47. "Sistro." Filippo Bonanni, *Gabinetto Armonico* (Rome, 1722), plate LXXXIV.



48. Benedetto Bacchini, *De sistris* (Utrecht, 1697), unnumbered plate at the end of the volume.



49. *Sistrum aegyptiacum*. Michel-Ange de La Chausse, *Romanum musaeum sive thesaurus* (Rome, 1746), vol. II, plate XV.



50. Filippo Bonanni, *Musaeum Kircherianum* (Rome, 1709), plate LIX.

In Bonanni's opinion, one of the developments distinguishing the ancient lyre from the modern *cetera* (cittern) is the addition of more strings. Bonanni reminded the reader about the tales of various mythical figures who added strings to the ancient lyre, considering these tales to be signs of the instrument's development. Eighteenth-century scholars did not have the tools available to contemporary scholars when interpreting myths. However, Bonanni's attempt to collect sources concerning mythical figures connected to music demonstrates an attention to a subject that is still being studied by scholars devoted to ancient Greek and Roman music. An analysis of the mythical figures who added strings to the lyre has been used to create hypothesis on the history of lyre or to consider how this instrument was seen in a particular context. Martin Lichfield West thinks of the mythical musicians as evidence of virtuosi that "were performing with more strings than the usual seven",⁸³ while Martha Maas and Jane McIntosh Snyder argue that

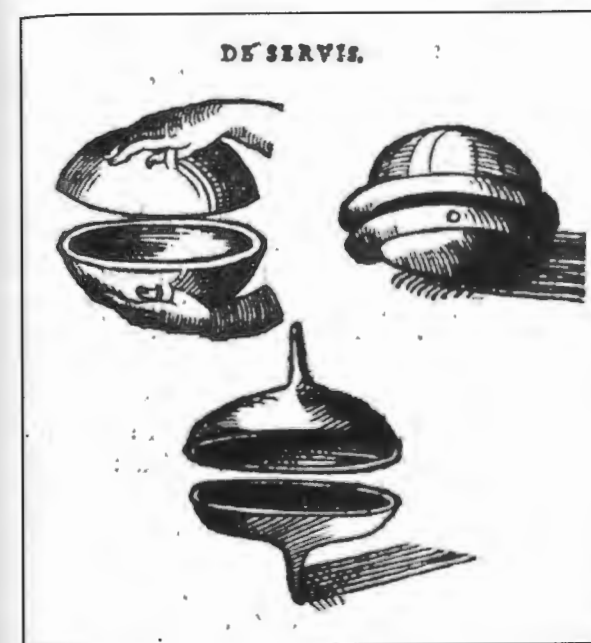
The Greeks did, of course, have "many-stringed" instruments—the various kinds of harps that they called *trigonon*, *pektis*, and *magadis*—and it may have been sudden popularity of these instruments (with twenty strings or more) during the late fifth century that led to the legends of added numbers of strings in the case of the lyra or kithara.⁸⁴

THE TYMPANUM. The frame drum discussed at the beginning of chapter LXXII, is the first of the percussion instruments discussed by Bonanni. The Latin name *tympanum* he translated into the Italian as *timpano*, explaining that some people called it also *timballo* or *tamburro*. He recognized that these words may be related to different meanings and explained that in chapter LXXII he is dealing with the *tympanum* which, in his opinion, is the older instrument. He described the *tympanum* with a series of quotes taken from the Vulgate and commentaries on the Bible.

Plate LXXII is modeled after Panvinio's *De triumpho* (1699), and not after Giusto Lipsio [figs. 40 & 41]. The player holds the drum with a series of pellet bells along the frame, in the center and strikes the membrane with a stick. Panvinio's frame drums have pellet bells on the frame, but only one drum in the picture is held in the center and both musicians are striking the membrane by hand.⁸⁵ These representations of *tympanum* are the result of the merging of different traditions, the frame drum, the cymbals, and a rattle that had a series of pellet bells or concussion jingles along the frame. A similar method was used in describing the Jewish instrument *machul*.⁸⁶



51. "Cembalo antico". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate LXXXVI. — 52. Jacob Spon, *Miscellanea eruditae antiquitatis* (Lyon, 1685), plate XL. — 53. "Cembalo diverso". Filippo Bonanni, *Gabinetto Armonico* (Rome, 1722), plate LXXXVII. — 54. Jacob Spon, *Miscellanea eruditae antiquitatis* (Lyon, 1685), plate XLII.



55. Lorenzo Pignoria, *De servis* (Augsburg, 1613), 91.

Finally, Bonanni described a plate from Lorenzo Pignoria's *De servis* which refers to the shape of the *tympanum* [fig. 42].⁸⁷ The first picture in the plate shows a sieve, as Pignoria said that *tympanum* looks like a sieve, followed by a picture of a kettle drum and two other kinds of wheels. Scheffer's *De re vehiculari* shows the same picture and describes the bottom two figures as wheels, which he names *tympana*.⁸⁸



56. "Baccante con Nacchera". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate XCIII. — 57-58. Jacob Spon, *Miscellanea eruditae antiquitatis* (Lyon, 1685), plates XLIII & XLIV.



59. "Scabillo degl' Antichi". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate CXXVII.

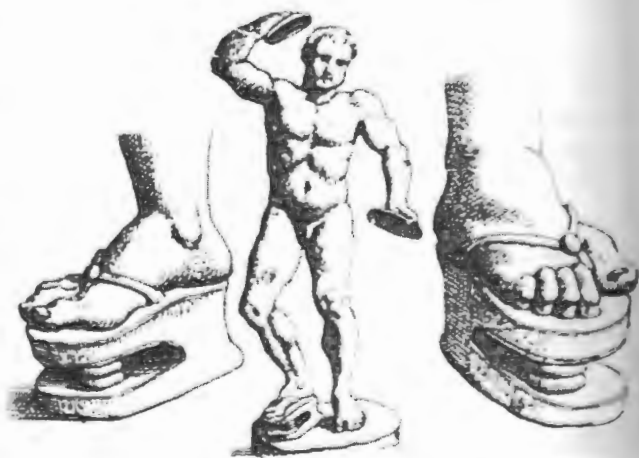
Chapter LXXIII primarily deals with the frame drum in Roman iconography. Bonanni remarked that this instrument was still used in rural dances, usually played by women, and plate LXXIII showed a female player in dress and headscarf typical of central Italy [fig. 43]. She plays a large drum with two rows of concussion jingles in the frame and a few pellet bells attached to the inner part of the instrument. The shape of her drum and her playing technique are typical of certain areas of central and southern Italy.⁸⁹

Once again Bonanni referred here to Buonarroti's description of the cameo of Cardinal Carpegna [fig. 16],⁹⁰ and went on to mention two other pictures: a bacchant with a *tympanon* on a centaur [fig. 44], and Bacchus lying on the breast of a female figure, which includes a tiger, two satyrs, and a *tympanon* between the two thyrsus [fig. 45]. Looking at other iconographical sources, Bonanni explained that sometimes the membrane of the drum was painted, like the one shown on the stone fragment with a bacchant playing a drum with pellet bells and a tiger depicted on the membrane [fig. 62].⁹¹ He also mentioned that concussion jingles were added to the frame, like on Agostini's gem showing a frame drum standing on its side [fig. 46].⁹² As a faithful reproduction of an ancient gem, Agostini's work is extremely interesting as the side view of ancient frame drums are very rare. The only other picture of a *tympanum* on its side is shown on the famous mosaic of "Villa di Cicerone".

THE SISTRUM. Bonanni's main sources on the sistrum were Giovanni Battista Casali's *De veteribus aegyptiorum*

*ritibus*⁹³ and Benedetto Bacchini's *De sistris dissertatio*.⁹⁴ For plate LXXXIV he said that it is taken from an ancient marble, but its source remains unclear [fig. 47]. For the sistrum he tried to find a Jewish origin, and quoted a passage from the first book of Samuel (not the book of the Kings, as he claimed) about the celebration of David killing Goliath. The Hebrew word translated as "sistrum" in the Vulgate is *mâ-chôl*. Contemporary scholars argue that the Jewish culture did not have sistrams.⁹⁵

Explaining the structure of the instrument, Bonanni mentioned Bacchini's treatise *De sistris*, which includes a beautiful plate showing sistrams from antiquarian sources [fig. 48], and then went on discussing the cults of Cybele and Isis in Rome, referencing also a sistrum preserved in the Leone Strozzi's Museum. This sistrum had a cone on the top, so Bonanni, quoting Bacchini, mentioned a passage of Lampridius that talks about the use of cones in the rituals dedicated to Isis, in which cult members used cones for self-flagellation. A sistrum in La Chausse's *Romanum musaeum sive thesaurus* shows a cone on the side of a sistrum [fig.



60. Albertus Rubenius, *De re vestiaria* (Antwerp, 1665). Libr. II, cap. XVII, 187.



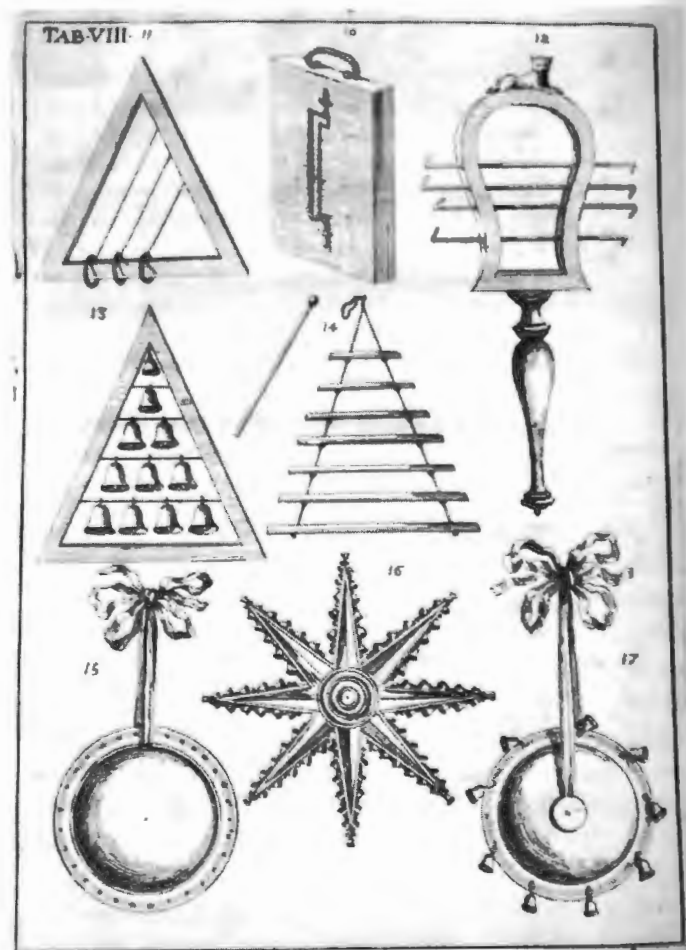
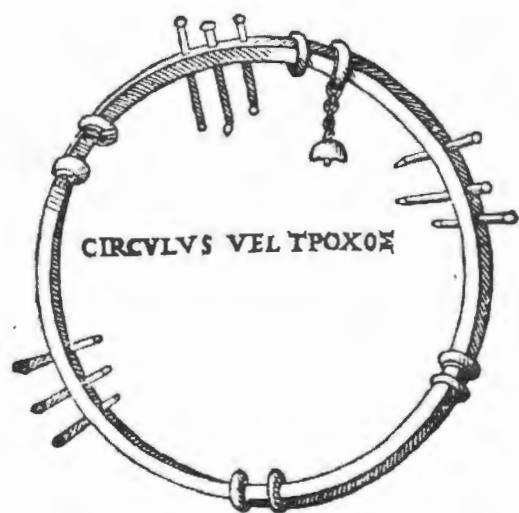
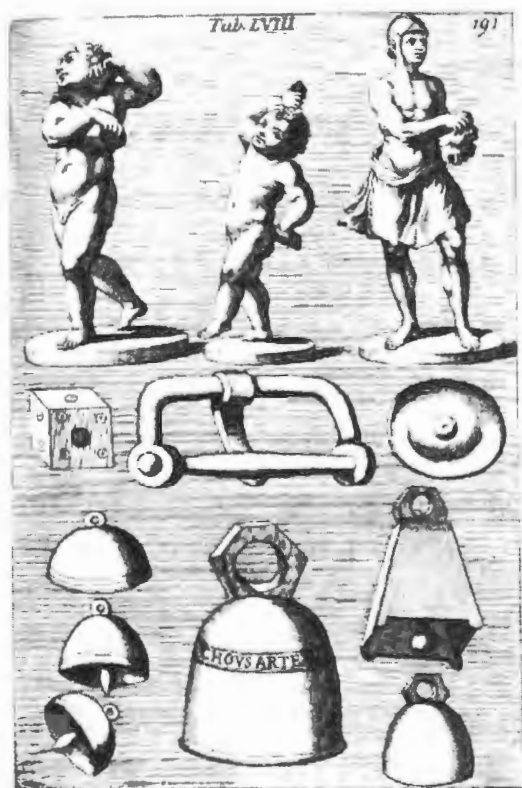
61. "Altro Cembalo antico". Filippo Bonanni, *Gabinetto armonico* (Rome, 1722), plate CXLII. — 62. Pietro Bellori and Pietro Santi Bartoli, *Le antiche lucerne sepolcrali figurate* (Rome, 1691), plate 23.



49], explaining in the text once again that the instrument was mentioned in relation to the cult of Isis and Cybele.⁹⁶ Finally, Bonanni mentioned also the sistrum in the *Museo Kircheriano*. Its image is particularly interesting in Bonanni's catalogue of the museum because it seems to be taken from a real object rather than being a copy of an iconographical source [fig. 50].

THE CYMBALS. Ancient cymbals are described in chapters LXXXVI and LXXXVII of *Gabinetto armonico* for which Bonanni's main source were the Latin quotations on cymbals in Pignoria's *De servis*, while the plates came from Jacob Spon's *Miscellanea erudita antiquitatis* [figs. 51-54].⁹⁷ *De servis* includes a plate with three kinds of cymbals that differ in the shape and in the kind of handle [fig. 55];⁹⁸ Spon's and Westerhout's plates show cymbals that also differ in these details. At the end of chapter LXXXVI Bonanni said that he had already finished his text on cymbals when he read Lampe's *De cymbalis veterum*; so he simply summarized the three books in which this text is distributed.⁹⁹

THE CLAPPERS. Plate XCIII of *Gabinetto armonico* [fig. 56] was taken from Spon's *Miscellanea erudita antiquitatis*¹⁰⁰ [figs. 57 & 58]; but the text of chapter XCIII is based on contemporaneous dictionaries.¹⁰¹ Although not evident from the picture, the instrument in plate XLIII Spon described as a cane split into two parts; clappers in plate XLIV are described as made of two valves. The clappers on Westerhout's plate are similar to the wooden clappers still used in folk music of central and southern Italy, called "castagnette" (or other variants of the name) due to similarity of their shape to small chestnuts (Italian, "castagne").¹⁰² Bonanni names these instruments *scudelle di metallo* and in Latin *acetabulum*, the latter he found in Du Cange's dictionary describing a pot for vinegar, a measure, or cymbals.



63. Filippo Bonanni, *Musaeum Kircherianum* (Rome, 1709), plate LVIII. — 64. "Troco". Girolamo Mercuriale, *De arte gymnastica* (Venice, 1601), 166. — 65. Bell from Pompei. Museo Archeologico Nazionale, Naples. — 66. Francesco Bianchini, *De tribus generibus instrumentorum musicae veterum organicae dissertatio* (Rome, 1742), plate VIII.

SCABILLO DEGL'ANTICHI. Bonanni's main sources for chapter CXXVII were Bartholin's *De tibiis veterum* and Rubenius's *De re vestiaria*, but plate CXXVII was not taken from there as it shows a player with a short tunic who plays only the *scabellum* [fig. 59], not the *scabellum* and cymbals on Rubenius's plate [fig. 60].¹⁰³ Bonanni said that the *scabellum* was used to mark the time for players and dancers. He did not mention its use by *tibia* players, although Bartholin described the *scabellum* in the chapter on *tibia* players' clothes. Finally, Bonanni briefly mentioned also a hypothesis put forward by Rubenius and Bartholin that the name *scabellum* refers to a wind instrument but gave no detail how they came to this conclusion.

ALTRO CEMBALO ANTICO is a controversial instrument, shown in plate CXLII [fig. 61], which comes from an image in Bellori's *Le antiche lucerne sepolcrali figurate* [fig. 62]. Bellori explained that the instrument in the bottom right, which comes from his museum, consists of a metal disc with seven bells and it is different from the frame drum with pellet bells shown on the left. Decoration of the oil lamp in the middle of the plate shows a bacchant with a wineskin on his right shoulder and a ring with bells in his left hand. Bonanni explained that this bacchant and the "cymbal" with seven bells refer to a game of jumping over wineskins, while playing the "cymbal", and in the support of it quoted a passage from Vergilius's second book of *Georgicae*. The same game is described in Bonanni's *Musaeum Kircherianum* where he illustrated a similar disc without bells, used in gymnasiums [fig. 63].¹⁰⁴

In both *Musaeum Kircherianum* and *Gabinetto armonico* the "cymbal" is compared to a ring with jingles, called *troco*, mentioned also by Mercuriale in his *De arte gymnastica*.¹⁰⁵ In playing the *troco* people had to throw the disc and catch it with a stick. Mercuriale shows a picture of such a ring that he got from Pirro Ligorio, who in turn copied it from a tomb of a poet near Rome [fig. 64]. In order to explain his "altro cimbalo antico" Bonanni quoted different sources, but doing that he mixed together frame drums, cymbals, and jingling devices used as gymnasium tools. The mixture of images and descriptions in Bonanni's and Bellori's works puts forward a skewed version of the cymbal, most probably due to a misinterpretation of an archaeological find.

Bianchini also described Bellori's "cymbal", which he calls *discus crotalophorus* or *cymbalum crotaligerum*, and another metal disc with no bells, called *cymbalum pensile*. He thought that the *cymbalum pensile* is a kind of a bell used to catch people's attention in thermal springs, and that the *discus crotalophorus* or *cymbalum crotaligerum* is a variant of the *cymbalum pensile* [fig. 66].¹⁰⁶ Cymbals described by Bianchini and Bellori could have been used for sound signals, like the bell from Pompei kept at the Museo Archeologico Nazionale in Naples [fig. 65].¹⁰⁷ Bianchini correctly calls the instrument *cymbalum pensile*, while Bellori's misinterpretation led to the invention of a different cymbal "all'antica".

The number of sources used by Bonanni to illustrate instruments of antiquity is impressive. The analysis of his *Gabinetto armonico* and his sources made it possible to analyze writings on musical instruments almost unknown in musicological research and forgotten after the nineteenth century.¹⁰⁸ A comparison between Bonanni's text and his sources, shows that an antiquarian interest in ancient Jewish and Roman music existed at least from the seventeenth century and that it had produced writings on musical instruments that were well known by scholars of the eighteenth century, and deeply influenced the knowledge of musical instruments of antiquity.

NOTES

The paper is based on my doctoral dissertation on Filippo Bonanni's *Gabinetto armonico*, defended at the Università degli Studi di Torino. I want to thank Aoife MacDermott who helped me with the English translation of this article.

¹ Any quotes from Bonanni's text will refer to the 1723 edition kept at the Biblioteca Nazionale Braidense in Milan. Unlike other copies of the work preserved in libraries in northern Italy, this copy is complete without missing chapters or engravings. My dissertation is not a critical edition of Bonanni's *Gabinetto armo-*

nico, but rather an analysis of the text in order to understand Bonanni's sources and what they told him about musical instruments. However, a comparison of 1722 and 1723 parts have been made in order to collate changes.

² See Ezio Bassani, *Gli antichi strumenti musicali dell'Africa nera, dalle fonti cinquecentesche al Gabinetto armonico del Padre Filippo Bonanni* (Padova: G. Zanibon, 1978); Cristina Ghirardini, "Les instruments chinois dans le *Gabinetto armonico* (1723) de Filippo Bonanni", *Musique, images, instruments* VIII (2006), 87-103; idem,

"Automoni sonori, strumenti esotici e strumenti popolari nel Gabinetto armonico di Filippo Bonanni", *Prospettive di iconografia musicale*, ed. by Nicoletta Guidobaldi (Milano: Mimesis, 2007), 191-222; and idem, "Il Gabinetto armonico di Filippo Bonanni e le sue fonti", *Acta musicologica* LXXIX/2 (2007), 359-405.

³ On the antiquarian approach to the past see Arnaldo Momigliano, "Storia antica e antiquaria", *Sui fondamenti della storia antica* (Torino: Einaudi, 1984), 3-45; idem, "L'origine della ricerca antiquaria", *Le radici classiche della storiografia moderna* (Firenze: Sansoni, 1992), 59-83; Francis Haskell, "The Dialogue Between Antiquarians and Historians", *History and its Images* (New Haven; London: Yale University Press, 1993), 159-200; and Carlo Ginzburg, "Descrizione e citazione", *Il filo e le tracce* (Milano: Feltrinelli, 2006), 15-38.

On the antiquarians mentioned in this article, see Ingo Herklotz, *Cassiano dal Pozzo und die Archäologie des 17. Jahrhunderts* (München: Hirmer Verlag, 1999); idem, "Bellori, Fabretti and Trajan's Column", *Art History in the Age of Bellori: Scholarship and Cultural Politics in Seventeenth-Century Rome*, ed. by Janis Bell and Thomas Willette (Cambridge: Cambridge University Press, 2002), 127-144; *Dell'antiquaria e dei suoi metodi*, ed. by Elena Vaiari (Pisa: Edizioni della Normale, 1998); Elena Vaiari, "Le antichità di Giovan Pietro Bellori: Storia e fortuna di una collezione", *Annali della Scuola Normale Superiore di Pisa: Classe di Lettere e Filosofia* VII/1 (2002), 85-152; idem, "Raffaello Fabretti, il «signor censore»: Una polemica antiquaria sui medaglioni di Gaspare Carpegna", *Studi secenteschi* XLVI (2005), 211-228. On the relationship between the treatises on musical instruments and the antiquarians see Naomi J. Barker, "Un-discarded Images: Illustrations of Antique Musical Instruments in 17th- and 18th-Century Books. Their Sources and Transmission", *Early Music* XXXV/2 (2007), 191-211. Barker's article was published in May 2007, when I had already accomplished my thesis. I defended my dissertation before the "collegio docenti" on 16 April 2007 and passed my final examination on 3 July 2007. We worked on the antiquarians' interest in musical instruments independently from each other.

⁴ Filippo Bonanni (1638-1725), entered the Jesuit order in 1654 and first studied letters and drawing. He then specialized in science and became famous for his skill in making microscopes. His first experiences as a teacher were in Orvieto and Ancona. In Ancona he knew Camillo Pichi, a herudit who had gathered a cabinet of curiosities. Under Pichi's influence Bonanni began to collect and study sea shells, and published works on shells and on molluscs (sometimes with plates that he drew and engraved): *Ricreazione dell'occhio e della mente nell'osservazione delle chiocciole* (Roma: Varese, 1681), *Riflessione sopra la relatione del ritrovamento dell'uova delle chiocciole* (Roma: Varese, 1683), and *Observationes circa viventia quae in rebus non viventibus reperiuntur* (Roma: typis Dominicis Antonij Herculis, 1691). These works were criticized by contemporaneous scholars because of Bonanni's blind faith in Aristotelism. From 1698 to the end of his life he was curator of the museum of the Collegio Romano. In 1709 he published an important catalogue of the *Musaeum Kircherianum* (Roma: Stamperia di Giorgio Placho, 1709). In the meantime he wrote works on coins, such as *Numismata Pontificum Romanorum* (Roma: Typographia Dominicis Antonij Herculis, 1699) and on the religious orders and roles with plates that illustrate their dress: *Catalogo degli ordini religiosi della Chiesa Militante*, 3 vols. (Roma: Stamperia di Antonio de' Rossi, 1706; Stamperia di Giorgio Placho, 1707 and 1710), *Catalogo degli ordini equestri e militari* (Roma: Stamperia di Giorgio Placho, 1711), *La gerarchia ecclesiastica considerata nelle vesti sagre, e civili usate da quelli, li quali la compongono* (Roma: Giorgio Placho, 1720). Bonanni is also well known by art historians for his important work on the Chinese laquer, *Trattato sopra la vernice*

detta comunemente cinese (Roma: Giorgio Placho, 1720). On the last treatise see Vincenzo Gheroldi, *Le vernici al principio del Settecento. Studi sul trattato di Filippo Bonanni* (Cremona: Turrus Editrice, 1995). On his life and works see P. Omodeo, "Buonanni, Filippo", *Dizionario biografico degli Italiani* (Roma: Istituto della Enciclopedia Italiana, 1972), vol. XV, 142-144.

⁵ On history of the Museo Kircheriano and for further bibliographical references see *Enciclopedia in Roma Barocca: Athanasius Kircher e il Museo del Collegio Romano tra Wunderkammer e museo scientifico*, ed. by Maristella Casciato, Maria Grazia Ianniello, and Maria Vitale (Venezia: Marsilio Editori, 1986); Eugenio Lo Sardo, *Athanasius Kircher: Il museo del mondo* (Roma: De Luca, 2001); and Alberto Bartola, "Alle origini del Museo del Collegio Romano", *Nuncius* XIX/1 (2004), 297-356.

⁶ Filippo Bonanni, *Gabinetto armonico* (Roma: Stamperia di Giorgio Placho, 1723), 1; a complete description of the camera is provided in Bonanni, *Gabinetto armonico*, 1-3.

⁷ The 1722 and 1723 editions of *Gabinetto armonico* are printed in quarto, with 177 pages and cxlviii plates. The volume includes the following chapters: capo I: *Della varietà degli istromenti musicali usati nel tempio, e difficoltà nel poterli descrivere*; capo II: *Si accenna la varietà d'altri stromenti, e la difficoltà nel poterli descrivere*; capo III: *Divisione degli istromenti*; capo IV: *Dell'uso degli istromenti musicali negli sacrificii, e feste degli antichi*; capo V: *Trionfi celebrati col suono*; capo VI: *Della musica negli pubblici giochi, e feste*; capo VII: *Delli suoni usati nella navigazione*; capo VIII: *Del canto usato negli conviti*; capo IX: *Del suono, e musica usata negli funerali*; capo X: *Del suono usato nella guerra*; capo XI: *Si pondera il canto ecclesiastico nello stato della legge cristiana*; capo XII: *Si accenna la diversità della musica, e si esamina di qual sorte convenga nelle chiese*; capo XIII: *Se convenga nella musica ecclesiastica usare istromenti musicali*. The titles and contents of these chapters are strictly connected to the second book of Caspar Bartholin, *De tibiis veterum* (Roma: Typographia Pauli Monetae, 1677).

⁸ Westerhout's involvement in making the engravings is mentioned only in the 1776 edition, but his earlier collaboration is confirmed by an anonymous author in an article devoted to Filippo Bonanni's life and work in the *Giornale de' letterati d'Italia* (1726), 381. Westerhout was involved in many of Bonanni's works, in particular with the plates of *Catalogo degli ordini religiosi della Chiesa Militante*; *Catalogo degli ordini equestri e militari*; *La gerarchia ecclesiastica considerata nelle vesti sagre, e civili usate da quelli, li quali la compongono*; and *Gabinetto armonico*. A close comparison of the plates of these works was made at the Civica Raccolta delle Stampe Antiche Bertarelli in Milan with the help of Patrizia Foglia. The analysis of the engravings demonstrates that they are the work of the same artist, even if Westerhout is mentioned only in the third volume of *Catalogo degli ordini religiosi della Chiesa Militante* and in the 1776 edition of *Gabinetto armonico*. The article in the *Giornale de' letterati d'Italia* of 1726 confirms this hypothesis, as it attributes the plates of these works to the "valente bulino d'Arnoldo" (see Ghirardini, "Il Gabinetto armonico di Filippo Bonanni e le sue fonti", 359-361. On Westerhout's life and work see Didier Bodart, *L'oeuvre du graveur Arnold van Westerhout (1651-1725): Essai de catalogue raisonné* (Brussels: Palais des Académies, 1974). The engravings of *Gabinetto armonico* have been published in a Dover edition with a short commentary revealing only superficial knowledge of the text of the treatise: Frank Harrison and Joan Rimmer, *Antique Musical Instruments and Their Players: 152 Plates from Bonanni's 18th-Century "Gabinetto armonico"* (New York: Dover Publications, 1964).

⁹ Bonanni, *Gabinetto armonico*, 14-15: "Senza dunque formare questioni inutili, e proporre dubbiose ricerche esporremo quelli Istromenti, delli quali non si può dubitare, nè sarà dispiacevole

cosa il riconoscere la forma di ciascuno espressa nelle Immagini aggiunte con quelle notizie, che di ciascuno saranno suggerite, e dalli marmi antichi, e dagli Autori principali, li quali fecero di essi menzione".

¹⁰ Bonanni, *Gabinetto armonico*, 64 and "De Tibiis, et earum differentiis". Johannes Rosinus, *Romanarum antiquitatum* (Basel: Officina Haeredum Petri Pernaie, 1583), 195.

¹¹ Bonanni, *Gabinetto armonico*, 70: "Tale Stromento non si trova descritto da niun'Autore antico, forse perche inventato da' moderni".

¹² Bonanni, *Gabinetto armonico*, 125: "Avevo scritto tutto ciò, quando mi venne alle mani un Volume pubblicato in Utrecht da Federico Adolfo Lampe con molta erudizione Greca, e Latina, tutta spettante alli Cimbali degli'Antichi".

¹³ Michel-Ange de La Chausse, *Romanum musaeum sive thesaurus* (Roma: Typis Bernabò et Lazzarini, 1746), vol. II, 21-50.

¹⁴ Francesco Bianchini, *De tribus generibus instrumentorum musicae veterum organicae dissertatio* (Roma: Impensis Fausti Amidei Bibliopolae in via Cursus, Typographia Bernabò et Lazzarini, 1742), vi-xi.

¹⁵ Elena Previdi, "Francesco Bianchini (1662-1729) e la sua dissertazione sugli strumenti musicali dell'antichità", *Fonti musicali italiane* XII (2007), 39-69.

¹⁶ Bianchini, *De tribus generibus instrumentorum*, 56-57; Bonanni, *Gabinetto armonico*, 133-34.

¹⁷ Filippo Bonanni, *La gerarchia ecclesiastica considerata nelle vesti sagre, e civili usate da quelli, li quali la compongono* (Roma: Giorgio Placho, 1720), 401-402.

¹⁸ Bianchini, *De tribus generibus instrumentorum*, 51-52.

¹⁹ Bonanni, *Gabinetto armonico*, 151-152.

²⁰ Augustin Calmet's *Dissertation sur les instruments de musique des Hébreux* was printed for the first time in 1713 in the *tome second des psaumes* of the *Commentaire littéral sur tous les livres de l'Ancien et du Nouveau Testament* (Paris: Pierre Emery, 1707-1716), and then in the volume entitled *Dissertation sur la poésie et la musique des Anciens en général, et des Hébreux en particulier* (Amsterdam: David Paul Marret, 1723). The manuscript version of Bianchini's *De tribus generibus instrumentorum* preserved in Bologna includes the quotations from Calmet's text. Elena Previdi points out that the Bologna manuscript is signed by Francesco Bianchini and it contains a copy of the treatise that was not updated by his nephew (see Previdi, "Francesco Bianchini (1662-1729) e la sua dissertazione sugli strumenti musicali dell'antichità", 48-49). I did not research further on Calmet and his *Dissertation sur les instruments de musique des Hébreux*, but if it was really published in 1713 and it did not have a previous circulation in a manuscript version, this would suggest that Bianchini continued working on his *De tribus generibus instrumentorum* until after 1713. However Bianchini quoted also Filippo Buonarroti's *Osservazioni storiche sopra alcuni medaglioni antichi all'Altezza Serenissima di Cosimo III Granduca di Toscana*, published in 1698 and said that it was recently published ("observat Senator Philippus Bonaroti in libro Observationum nuper edito" in Bianchini, *De tribus generibus instrumentorum*, 18). This would agree with Previdi's hypothesis about which Bianchini begun to work at the treatise at the beginning of the eighteenth century.

²¹ Athanasius Kircher, *Musurgia universalis sive ars magna consoni et dissoni* (Roma: Typis Ludovici Grignani, 1650), vol. I, 47-55. Bonanni did not describe all the instruments illustrated by Kircher and therefore only those listed in *Gabinetto armonico* will be analysed here. Since Capo I of *Gabinetto armonico* does not provide figures, Kircher's pictures from *Musurgia universalis* are in-

cluded here.

²² See Abraham ben David Portaleone, *Shiltei ha-gibborim* (Mantova: s.n., 1612); and idem, *Die Heldenschilde*, ed. by Gianfranco Miletto (Frankfurt am Main: Peter Lang, 2002).

²³ Giuseppe Veltri and Gianfranco Miletto, "Jewish Musical Theories and Their Aftermath in the *Prisca theologia*: On the Sources of Athanasius Kircher's *Musurgia universalis*", *EJAS Newsletter* XIII (2003), 18-26.

²⁴ Bonanni's and Kircher's text are included in Appendix. Fragments from Portaleone's text are quoted in footnotes.

²⁵ Kircher, *Musurgia universalis*, vol. I, 49.

²⁶ Portaleone, *Die Heldenschilde*, 159-160: "Zwar wird der töf aufgrund seiner Form *kymbalon* genannt, die ähnlich einem kleinen Schiff ist, das auf Griechisch *kymba* heißt, geschrieben mit kappa, ypsilon mit chîreq, mi, beta, und alfa. Das kleine Schiff heißt bei den Griechen auch *afrakta*, geschrieben mit alfa, pe mit rafe, das der 21. Buchstabe von ihnen ist, rho, alfa, kappa mit dagesch, tau und alfa. In der rabbinischen Sprache heißt das kleine Schiff *arba*, und auf Lateinisch *linter*, in der Fremdsprache *burchio*. So wird töf 'cembalo' genannt, weil er dem kleinen Schiff ähnlich ist, ohne Deckel aus Metall oder aus Kupfer oder aus anderen Metallen, lang, schmal und spitz am Anfang und am Ende, ein wenig breit und hohl in der Mitte.

Und insbesondere die ägyptischen Priester benutzen dieses Instrument am Tempel ihrer Göttin, die 'Mutter aller Götter' genannt wird, und die bei ihnen *Dea Vesta* entspricht, was das Fundament der Erde selbst ist, das sie sich als Göttin vorgestellt haben. Auch andere Völker spielten an ihren Freudenfesten die *tûppîm*. Denn sie waren gewöhnt, auf diesem Instrument, das, wie gesagt, aus hohlem Metall war, mit einem Stiel aus Eisen oder Kupfer zu schlagen und zu klopfen, manchmal stark und manchmal leicht, manchmal mit unmittlbarer Aufeinanderfolge von vielen Schlägen, einer sofort nach dem anderen, und manchmal ruhig und langsam, so daß sie durch dieses Klopfen unterschiedliche Töne ertönen liessen. Und dies ist die Erläuterung des [Wortes] töf nach der Meinung ihrer Gelehrten.

Aber unsere Meister, ihr Andeken zum Segen, glaubten am Ende des Traktats *Qinnim* Kapitel *baneh debarîm 'amûrîm*, Mischnah 6, dies sei Leder, gespannt auf einem Holzinstrument oder etwas ähnliches. Mit ihren Worten: *Sagte R. Jehosua: Das ist, was sie sagten, "wenn er lebt, hat er einzige Stimme, wenn er tot ist, hat er sieben Stimmen." Auf welche Weise sieben? Seine zwei Hörner sind zwei Trompeten, seine zwei Schenkel sind zwei Flöten, seine Haut für den töf etc...* (mQin III, 6). Trotz alledem war der töf ohne Zweifel, wie unsere Meister, oder wie zu unserem Volk nicht gehörenden Gelehrten, gesagt haben, ein minderwertiges Instrument, das für die künstlerische Musik überhaupt nicht geeignet war."

²⁷ See Kircher's and Bonanni's text in Appendix and Portaleone's in the previous footnote.

²⁸ Jeremy Montagu, *Musical Instruments of the Bible* (Lanham, Md.; London: Scarecrow Press, 2002), 16-17, 131-132.

²⁹ Portaleone, *Die Heldenschilde*, 160-161: "Die 'aitzê berôschîm sind aber, meiner Meinung nach, besondere Instrumente, die einen lauten, für die künstlerische Musik unpassenden, Schall hervorbrachten, deren Gehäuse und Bestandteile insgesamt nur aus Zypressenholz waren, ohne Zusatz von etwas, was hilft, ihren Klang zu erzeugen, wie man es in den *kinnôrôt* oder in den *nevalîm* findet, auf denen aber Saiten sind, mit denen man gut musizieren kann, wenn man auf sie schlägt. Es sind zwei Instrumente aus Zypressenholz, eines von ihnen ist dem Mörser oder einer kleinen Schüssel ähnlich, was auf Griechisch *thyeidion* heißt, geschrieben mit theta, ypsilon, mit chîreq unter alef, eta, delta, iota, alfa, omicron, und nu, die ihr in ihrer Zusammensetzung *thyeidion*

lesen sollt, auf Latein *mortariolum*, in der Fremdsprache *mortaro*. Und in der Tat ist das andere Gerät einem kleinen Stöbel ähnlich, mit seiner Länge nur eine Spanne, schmal, und rund. In seiner Mitte ist es ziemlich dünn und an seinen zwei äußersten Enden ist es größer und einem Knauf oder einem Apfel ähnlich, auf Griechisch *yperos* genannt, geschrieben mit ypsilon mit chîreq unter alef, pe, epsilon mit tzere unter alef, rho, omicron und sigma, was ihr in ihrer Zusammensetzung *yperos* lesen sollt, auf Latein *pistillum* mit doppel lamed, in der Fremdsprache *maglio*. Diese beiden Geräte heißes auf Griechisch *krotalon*, geschrieben mit kappa, rho, omicron, tau, alfa, lambda, omicron, nu, die ihr in ihrer Zusammensetzung *krotalon* lesen sollt, und auf Latein heißes sie auch so, *krotalum*, und in der Fremdsprache *naccare*.

Die, die auf sie schlagen, halten diesen kleinen Mörser mit ihrer linken Hand, und mit dem Stößel, den sie in der rechten Hand halten, schlagen sie manchmal auf den Boden des Mörsers bzw. der Schüssel, und manchmal mit dem beiden äußersten Enden des Stößels auf seine Öffnung, manchmal mit dem einem Ende und manchmal mit dem anderen, einzeln oder aufeinanderfolgend mit mehreren Schlägen, schnell oder langsam, und damit erzeugen sie einen 'qualvollen' Klang, 'der mit den Bauern verbunden ist' (vgl. Job. 5, 23).³⁰

³⁰ Joachim Braun, "Biblical Instruments", *The New Grove Dictionary of Music and Musicians*, ed. by Stanley Sadie (2nd ed., London: Macmillan, 2001), vol. 2, 525.

³¹ Montagu, *Musical Instruments of the Bible*, 52-53.

³² Kircher, *Musurgia universalis*, vol. I, 48-49.

³³ Portaleone, *Shiltei ha-gibborim*, 160: "Der *machôl* heißt *systros* oder *krouma* auf Griechisch, geschrieben mit kappa, rho, omicron, ypsilon mit chîreq, sigma, mi, und alfa. Auf Latein heißt er *tintinnabulum* und in der Fremdsprache *circolo campanellato*. Dies ist ein Instrument aus Kupfer oder aus Silber oder aus Gold, rund und einem großen Ring ähnlich, offen von allen seinen Seiten. Rund um seinen etwa drei Finger breiten Kreis herum, waren kleine Schellen angehängt und beim Schlagen erzeugen die Klöppel mit den Schellen fröhliche Klänge. Die ägyptischen Priester benutzen dieses Instrument zu den Festen der Göttin, die bei ihnen Isis, Tochter von Inaco, genannt wird und früher 'Io' hieß. Und zwar erfreuten sich vor allem die Frauen, sowohl von unserem Volk als auch von anderen Völkern, sehr an diesem Instrument zu jedem Fest".

³⁴ Montagu, *Musical Instruments of the Bible*, 48-50.

³⁵ Portaleone, *Shiltei ha-gibborim*, 161-162: "Eigentlich haben die *mena 'an 'e'im* keinen eigenen Namen auf Griechisch, es sei denn, daß wir aus dem Wort *diaseio*, geschrieben mit dalet, iota, alfa, sigma, epsilon, mit tzere unter alef, und iota, ein willkürliche Ableitung bilden wollen. Diese beiden zusammengeschriebenen Buchstaben, d.h. epsilon mit tzere und iota nach ihm folgend, benutzen die Griechen anstatt des chîreq, und der andere Buchstabe von diesem Verb is omega, was ihr in ihrer Zusammenfügung *diaseio* lesen sollt, mit dem die Griechen die Bewegung, die Schwankung und die Erschütterung benennen, so daß dieses Instrument bei uns – mit einer Metapher – *diaseirgalion* benannt wird. So ist es auch für die Lateiner, denn sie haben ebenso keinen eigenen Namen für die *mena 'an 'e'im*, weil ihr Übersetzer dieses Instrument *sistrum* nannte. ... Aber einige spätere Lateiner (z.B.: Arn. IV,21, VII,32, Apul. Met. XI,4, Tert. Iud. IX) dachten sich einen neuen Namen aus und nannten dieses Instrument in ihrer Sprache *crepitaculum* und einige andere nannten es *platagin* und erzählten, daß Archita Tarentino (vgl. Aristoteles, *Polit.* VIII,6,1), der pythagoreische Philosoph, der erste Erfinder war, der den Prototyp seines Modells machte, damit die Jungen spielen konnten und daher die gefährlichen Spielzeuge, mit denen sie

früher spielten, beiseite ließen. Doch sie irren sich in ihrem Reden, weil es die Söhne unseres Volks viele Jahre vorher, bevor dieser Philosoph geboren wurde, kannten. Und Plautus, der Autor, nannte es mit dem Namen, *tax*, und das ist kein eigener Namen, sondern lautmalend wegen des Schlagens (Plautus, *Persa*, II, 3,12). Auch die Fremden aber nennen sie *battisterii*, ebenso wegen des Schlagens.

Dieses Instrument bestehet aus einer quadratischen, glatten Holztafel und auf seiner oberen Seite hat es einen Handgriff, um es anzufassen, und auf dieser Tafel sind an jeder Seite runde, kugelförmige Holzstücke mit einem Eisenband oder mit Hanfschnur in der Mitte der Tafel befestigt. Und wenn man die Tafel schüttelt und auf sie schlägt, bringen diese Kugeln einen starken Klang bis weit entfernt hervor, so daß diese Instrumente zu den Musikinstrumenten nur gezählt wurden, um dem Volk einen Lärmklang in einem Fest hören zu lassen.³⁶

³⁶ Montagu, *Musical Instruments of the Bible*, 54, 128-29.

³⁷ Portaleone, *Die Heldenschilde*, 162: "Was die *magrefah* von *Tamid* anbelangt, kenne ich ihre Form nicht. Sie wurde villeicht so genannt, weil sie die Form des Ofenbesens hatte, die fast die Hälfte eines Kreises ist. Sie war, nach meiner bescheidenen Meinung, aus sehr gut geläutertem Metall. Und als man sie auf den Fußboden des Altars warf, gab sie in Jerusalem einen lauten Klang von sich, der bis nach Jericho gelangte, und man tat das, um die Priester und die Leviten zu versammeln und um die Unreinen und die Osttore zu stellen, nicht aber zum Gesang. Ich glaube, daß man diese *magrefah* eher krumm als gerade machte, damit sich ihr Lärmklang nicht zerstreute und plötzlich von ihr schwand, wie es passiert wäre, wenn sie ganz gerade gewesen wäre. Infolge ihrer Kurven beim Klopfen ihrer Seiten auf den Boden des Tempels, der mit Alabaster und Marmorsteinen gepflastert war, führte sie rundherum, wie in einem Kreis, einen Nachhall in ihr Inneres hinein mit einer Verfolgung, so daß dabei ein wiederholter und in der *magrefah* widerhallender Klang an jener Stelle entstand, von der er vorher ausgegangen war, so wie der *Widerhall der Berge entsteht* (Ez 7,7), der auf Griechisch *echo* heißt, mit eta, chi, der 22. Buchstabe von ihnen, und omega geschrieben, was ihr in ihrer Zusammenfügung *echo* lesen sollt, auf Latein und in der Fremdsprache *eco*".

³⁸ Montagu, *Musical Instruments of the Bible*, 97-98.

³⁹ Portaleone, *Die Heldenschilde*, 163: "Die *maschrôqita'* aber heißt auf Griechisch *syrix*, geschrieben mit sigma, ypsilon, mit chîreq unter alef, rho, iota, gamma, das vor xi am Stelle von nu ist; und der letzte Buchstabe dieses Worter ist xi, was ihr in ihrer Zusammenfügung *syrix* lesen sollt. Auf Griechisch heißt sie auch *kalamon* und auf Latein *fistula*, und die Fremden nenne sie *siringa*. Das ist ein Instrument, das entweder aus einem Rohr oder aus mehreren kleinen Rohren besteht, die eines nach dem anderen in derselben Reihe angeordnet sind. Und wenn sie auch aus einem Rohr besteht, nenne sie die Griechen *monokalamon*, geschrieben mit mi, omicron, nu, omicron, kappa, alfa, lambda, alfa, mi, omicron, und nu, weil *monos* 'einzig' bedeutet. Und wenn sie aus mehreren Rohren bestand, nannten sie die Griechen *politikalamon*, weil *polys*, geschrieben mit pe, omicron, lambda, ypsilon, mit chîreq und sigma, 'mehr' bedeutet, d.h. aus mehreren Rohren [bestehend]. Diese mehreren Rohre stufen sich regelmäßig ab. Sie sind oben offen und unten durch ein Holzstück geschlossen, darüber eine Bedeckung aus Leder von einem Tier, in die sie hineingesteckt wurden, wie in eine Hülle. Der Griff ist an seiner Spitze an der Stelle, wo sie hineingesteckt sind, breit und an seinem Ende spitz. Weil seine Form einem Kamm [Hebräisch *masreq*] ähnelt, mit dem die Männer und die Frauen ihren Kopf kämten, heißt dieses Instrument *maschrôqita'*. Oder vom Ausdruck des "Herdenpiffes" (*sheriqôt 'adarim*; Ri 5,16), weil man verschiedene

Pfiffe nach der Länge und der Kürze der Rohre oder nach der Stärke und der Schwäche des Blasens auf ihr hervorbringt, wenn diejenigen, die damit blasen, es über die untere Lippe ihres Mundes führen und in die Rohre blasen."

⁴⁰ Portaleone, *Die Heldenschilde*, 170-172: "Die *chalilim* sind ebenfalls Musikinstrumente, um mit ihnen zu singen; sie sind hohl, rund und lang und von dreierlei Arten. Und zwar ist dieses Instrument, welches in unserer heiligen Sprachen *qeren* heißt (1 Chr 25, 5) und zwei andere Arten, deren eine in der Fremdsprache *piffero* und deren andere *flauto* heißt. Der *qeren* ist aber ein langes, rundes Holzinstrument, dessen oberer Teil beim Mundansatz schmal und der untere Teil breit und mit Kalbsleder überzogen ist, das entweder schwarz oder rot oder mit einer anderen Farbe, je nach individuellem Geschmack, gefärbt ist, und gekrümmt wie das Horn eines Rindes oder einer Ziege oder dergleichen. Seine Krümmung verläuft schräg zur rechten Seite des Spielenden und nach seiner Länge an der inneren Seite gibt es eine bestimmte Anzahl kleine runde Löcher. In seinem hinteren Teil ist nur ein rundes Loch. Wenn man diese Löcher schließt und öffnet und mit den Finger auf sie drückt und das Instrument mit dem Mund bläst, läßt es einem angenehmen Klang ertönen, so wie es der Musiker will. Dieses Instrument hat an seiner Spitze ein rundes Mundstück, das an der Stelle gesetzt ist, in die man bläst, und der von demselben Holz ist, mit dem der Körper des Hornes gebaut ist, und auch genauso mit Leder bedeckt ist. Dieses Mundstück, dessen unterer Teil auch rund ist, wird in den Hohlraum des Hornes eingesetzt und schließt es fest ab. Während man beim Gesang nur ein Horn blasen konnte, waren jedoch viele *chalilim* dabei, je nach der Natur der Intervalle der Sänger, einfache oder zusammengesetzte, um eine vollkommene und hervorragende Melodie zu erzeugen; denn diese Art von *chalil* war auch für die Leviten zur Zeit des [liturgischen] Gesanges geeignet.

Der *piffero* ist aber ein rundes und langes Holzinstrument, oben ebenfalls schmal und unten breit und krumm, von unten biegt sich das krumme Teil nach oben, so wie beim größten Teil der kleinen *pifferi*. Auch an allen *pifferi* gibt es ihrer Länge nach runde Löcher im oberen Teil und ein rundes Loch im gegenüberliegenden Teil, die geöffnet und zugemacht werden, indem man mit den Fingern auf sie drückt, wenn man sie bläst und spielt. Auf ihrer Spitze haben sie ein Mundstück aus Holz einer anderen Sorte als das, aus dem das Instrument ist. Es ist dort, wo es in den Hohlraum des *piffero* eintritt, rund und platt an seiner Spitze, wo man den Mund ansetzt und spielt. Und dort ist ein Schlitz der Länge nach in der Breite des Mundstückes. Es ist entweder aus Bronze oder aus Holz oder aus Rohr, oder aus Elfenbein, das in der Fremdsprache *avolio* heißt. Dieses Instrument ist zwar kostbar und gut, jedoch wegen der Stärke seines Klanges zur Gesangbegleitung ungeeignet. ...

Der *flauto* ist ebenfalls ein rundes und langes Holzinstrument, fast gleichmäßig in allen seinen Seiten, oben wie unten. Sein unterer Teil ist aber etwa breiter als der obere bei der Öffnung. In seiner ganzen Art ist er gerade und überhaupt nicht krumm und im unteren Teil ganz hohl. An der Öffnung aber, wo die anderen erwähnten Arten von *chalilim* das Mundstück haben, ist sein Holz innen voll wie ein runder Holzstock, schräg vom oberen Teil zum unteren geschnitten, so daß er dort dünn wird, wo man den Mund aufsetzt, um ihn zur Zeit des Spiels zu blasen. An der Öffnung dieses Instruments ist ein langer Schlitz der Breite des geschnittenen Holzstocks nach, der in den Hohlraum des Instruments hineinführt. Innen, am äußersten Ende des Holzstocks gibt es eine Art Luke oder Fenster, verschlossen und [dennoch] offen in den Hohlraum des Instruments hinein, und unter diesem Fenster gibt es kleine runde Löcher der Länge des

Instruments nach und ein anderes rundes Loch darunter in seinem unteren Teil, wie es bei den zwei erwähnten *chalilim* war."

⁴¹ Bonanni, *Gabinetto armonico*, 9-13.

⁴² The texts of *Gabinetto armonico* and of Bonanni's sources are included in Appendix.

⁴³ Trichet says that Amyot, working with Plutarch's works, proposed to translate *aulos* as hautbois; see Pierre Trichet, *Traité des instruments de musique* (Genève: Minkoff, 1978), 73-74. Scacchi compares *tibiae* to instruments "quod vernacula lingua apud nos *pifaro* dicitur." [Fortunato Scacchi, *Sacrorum Elaeochrismaton Myrothecia tria in quibus esponuntur olea, atque unguenta divinos in codices relata* (Amsterdam: Petrum de Coup, Biliopolam sub signo Ciceronis, 1710), 1105], and in the plate corresponding to this description there is a shawm. Bartholin quotes Scacchi's description (Bartholin, *De tibiis veterum*, 25) and reproduces the shawm in plate I.

⁴⁴ Bartholin, *De tibiis veterum*, 33-35.

⁴⁵ *Ibid.*, 64-65.

⁴⁶ Scacchi, *Sacrorum Elaeochrismaton*, 1101-1102 and 1105. The first edition of Scacchi's *Sacrorum Elaeochrismaton Mirothecia tria* was published in Rome between 1625 and 1637; it was not possible to locate the first edition and hence the quote is taken from the 1710 one. This situation occurs also for other Bonanni's sources: when it was not possible to study the first edition of the works quoted in *Gabinetto armonico*, a later one was employed.

⁴⁷ Bonanni, *Gabinetto armonico*, 47: "Cioè d'un Soldato, il quale stà in atto di suonare una Tromba dritta, e corta [...] presa dalla Colonna Trajana, e posta dalli Schacchi nel capo 57. del Mirotecio 3. ove avverte, che per poter suonare tale Istromento conveniva adattare alla bocca del medesimo una linguetta, con cui era regolato il suono."

⁴⁸ Bartholin, *De tibiis veterum*, 201: "Insignem capistrati figuram cum Tibijs ori insertis, ex Basi triangulari in Capitolio hic exibeo, TABULAE II. Fig. 3. quem admodum mihi eius delineationem concessit Illustrissimus Eques Car. Anton. a Puteo, singulari erga me omnesque alios humanitate praeditus, ex insigni illo Antiquitatis Thesauro, qui plurimis Voluminibus apud illum servatur." Naomi Barker argues that the triangular base mentioned by Bartholin is an Attic tripod dating from the first century AD, now at Newby Hall, Yorkshire (see Barker, "Un-discarded images", 198-199).

⁴⁹ A marble relief that shows a satyr playing conical *tibiae* similar to the instrument of *Gabinetto armonico*'s plate III still exists in Musei Vaticani. It is a neo-attic relief of second century AD. See Febo Guizzi, "The Oboe of Quintus Appeus Eutyichianus", *Imago musicae* XVIII-XIX (2001-2002), 147.

⁵⁰ Scacchi, *Sacrorum Elaeochrismaton*, 1101-1102 and 1105.

⁵¹ Bartholin, *De tibiis veterum*, plate III, no. 5 and plate I, no. 1.

⁵² Filippo Buonarroti, *Osservazioni storiche sopra alcuni medaglioni antichi all'Altezza Serenissima di Cosimo III Granduca di Toscana* (Roma: Stamparia di Domenico Antonio Ercole in Parione, 1698).

⁵³ Giovan Pietro Bellori, Pietro Santi Bartoli, and Michel-Ange de La Chausse, *Le pitture antiche delle groite di Roma, e del sepolcro de' Nasonj disegnatte, & intagliate alla similitudine degli Antichi Originali da Pietro Santi Bartoli e Francesco Bartoli* (Roma: Nuova Stamparia di Gaetano degli Zenobj, 1706).

⁵⁴ Bonanni, *Gabinetto armonico*, 62: "E però degno il notarsi, che tali Tibie hanno la forma quasi simile al Lituo, essendo alquanto ripiegate verso la bocca, con cui termina tal' Istromento, e non totalmente dritto, come sogliono essere li Flauti, e simili."

⁵⁵ Marin Mersenne, *Harmonie universelle* (Paris: CNRS, 1986), vol. III, book III, 173v: "Les flustes AC&BD sont egales, et peuvent

estre toutes deux embouchées par AB. Leurs lumieres sont representées par EF, elles n'ont chacune que cinq trous, et sont attachées et arrestées ensemble par les barres G et H."

⁵⁶ Giovanni Battista Casali, *De urbis ac Romani olim imperii splendore* (Roma: Typographia Franciscii Alberti Tani, 1650), Francesco De Ficoroni, *Osservazioni di Francesco de' Ficoroni sopra l'antichità di Roma; descritte nel diario italico pubblicato in Parigi l'anno 1702 dal m. rev. padre D. Bernardo de Montfaucon* (Roma: Stamperia di Antonio de' Rossi alla Piazza di Ceri, 1709), Filippo Tomasini, "De donariis", *Thesaurus antiquitatum romanarum* (Leiden; Utrecht: Petrum Vander A.A. et Franciscum Halmam, 1699), vol. XII, 737-884, and Bartholin, *De tibiis veterum*.

⁵⁷ Casali, *De urbis*, 367-68.

⁵⁸ De Ficoroni, *Osservazioni*, 56-61.

⁵⁹ Bernard de Montfaucon, *Diarium Italicum* (Paris: apud Joannem Anisson Typographiae Regiae Praefectum, 1702), 450-452.

⁶⁰ The original quotation is included in appendix.

⁶¹ Jean Jacques Boissard, *Secunda pars antiquitatum Romanarum seu topographia Romanae urbis* (Frankfurt: apud Matthaeum Merianum, 1628).

⁶² Tomasini, "De donariis", 848-849.

⁶³ This relief still exists, and is housed at the Staatliche Museen Preussischer Kulturbesitz in Berlin. *L'idea del bello. Viaggio per Roma nel Seicento con Giovan Pietro Bellori* (Roma: De Luca, 2000), vol. II, 505-506.

⁶⁴ Giovan Pietro Bellori, Pietro Santi Bartoli, and Alfonso Chicon, *Colonna Traiana eretta dal Senato, e Popolo Romano all'imperatore Traiano Augusto nel suo foro in Roma: Scolpita con l'istorie della guerra dacica la prima e la seconda spedizione, e vittoria contro il re Deceballo. Novamente disegnata, et intagliata da Pietro Santi Bartoli* (Rome).

⁶⁵ Onofrio Panvinio, "De triumpho commentarius", *Thesaurus antiquitatum romanarum* (Leiden; Utrecht: apud Petrum vander A.A. et Franciscum Halmam, 1699), vol. IX, 1336-1398. Bonanni often describes this engraving in *Gabinetto armonico*, but he never says that it came from Panvinio's work. He maintains that it was taken from a description of a triumph in a Giusto Lipsio's work. However none of Giusto Lipsio's works contain a plate that represents a triumph. It is possible to argue that this engraving is in Panvinio's *De triumpho* because in capo V (Bonanni, *Gabinetto armonico*, 21) Bonanni mentions this plate as follows: "Questa opinione di replicati, e diversi Cantori, siccome la distribuzione di essi nella pompa del Trionfo, fù elegantemente espressa da Lipsio, ed in bella scoltura si può vedere aggiunta al suo trattato nella nuova edizione del Tomo nono delle Antichità Romane, pubblicate dal Crevio." Volume IX of Crevio's *Antiquità Romane* is vol. IX of Graevius's *Thesaurus antiquitatum Romanarum*. In this volume a work by Giusto Lipsio (*Saturnalium Sermonum libri duo, qui de Gladiatoribus*) is followed by Panvinio's *De triumpho*. In the *De triumpho* there is a beautiful engraving that shows a triumph in which the iconographical sources of the cornu player in plate VIII and of the frame drum player in plate LXXII are found.

⁶⁶ "e furono chiamate anche con il nome di corno, siccome di Tromba, e di Buccina." Bonanni, *Gabinetto armonico*, 51.

⁶⁷ Bartholin, *De tibiis veterum*, 228.

⁶⁸ Bellori, Bartoli, and La Chausse, *Le pitture antiche*, 56.

⁶⁹ Raffaele Fabretti, *De columna Traiani* (Roma: ex Officina Nicolai Angeli Tinassij, 1683), 203-204.

⁷⁰ A recent article published in this review is Cristina-Georgeta Alexandrescu, "The Iconography of Wind Instruments in

Ancient Rome: Cornu, Bucina, Tuba and Lituus", *Music in Art* XXXII/1-2 (2007), 33-46.

⁷¹ Renato Meucci, for example, some years ago pointed out that the name *tuba* can only refer to a straight metal trumpet, while it is unclear which instrument used to be called *cornu* and which is the *bucina*. In order to solve this problem he proposed to change Vegetius's passage on *semivocalia* calls in the third book of *Epitoma rei militaris*. See, Renato Meucci, "A proposito di un passo di Vegetio: Cornu e bucina", *Rivista di cultura classica e medioevale* XV (1983), 71-73; idem, "Riflessioni di archeologia musicale: Gli strumenti militari romani e il lituus", *Nuova rivista musicale italiana* XIX/3 (1985), 383-394; idem, "Roman Military Instruments and the Lituus" *Galpin Society Journal* XLII (1989), 85-97.

Vegetius wrote: "Tuba quae directa est appellatur; bucina quae in semet aereo circulo flectitur; cornu quod ex ex uris agrestibus, argento nexum, temperatum arte spirituque canentis flatus emitti auditum" [Renato P. Flavio Vegetio, *Epitoma rei militaris*. Ed. by Alf Önnersfors (Stuttgart; Leipzig: Teubner, 1995), 114-115].

Meucci claims that Vegetius's description of the *cornu* and the *bucina* is more suitable to the early Middle Ages, when "the ancient, circular bronze instrument disappeared and metallic, curved instruments of various dimensions, which came to be called *bucinae* took their place". (Meucci, "Roman Military Instruments", 85) Therefore, Meucci argues that the version currently accepted by philologists of Vegetius's passage is as a result of a scribal amendment made in the sixth century, and he contends that all existing sources using Vegetius's text are wrong. In his opinion, the correct version should be: "Tuba quae directa est appellatur; cornu quae in semet aereo circulo flectitur; bucina quod ex ex uris agrestibus, argento nexum, temperatum arte spirituque canentis flatus emitti auditum".

Meucci goes on to say that poetic sources are the only type of source that proves the military use of the *lituus*. Moreover "there is a total absence of representational evidence of such usage: in fact the only depictions which definitely belong to the Roman era show the instrument in the hands of civilian or cultic players". He adds that in literary sources the *bucina* and *lituus* are never listed together, "as if it were either irrelevant or impossible to distinguish between the two" (Meucci, "Roman Military Instruments", 87).

Then he quotes later sources in which the *lituus* is described as a sort of *bucina* and arguing that the two words were synonyms. Finally Meucci says that "If one takes into consideration, then, the evidence cited above, one must accept two distinct uses of the word *lituus*: the first to indicate the bronze instrument of hooked, 'J-like' form, clearly Etruscan in origin and to be traced in documents up to the end of the first century B.C.; the second, in a later period, standing for the simple animal horn which is also called the *bucina*" (Meucci, "Roman Military Instruments", 89).

⁷² John Ziolkowski, "The Roman Bucina: A Distinct Musical Instrument?", *Historic Brass Society Journal* XIV (2002), 31-58: 51-52.

⁷³ *Ibid.*, 49-50.

⁷⁴ See for instance Emilio Di Fazio, *Gli strumenti musicali nei Monti Lepini* (Bologna: Ut Orpheus Edizioni, 1997).

⁷⁵ The strings in the *cetera* in plate XLVIII are not attached at the bottom end of the instrument, as usual, but are attached to the bridge on the soundboard.

⁷⁶ Jules César Boulenger, *De theatro, ludisque scenicis libri duo* (Troyes: Typis Petri Chevillot, 1603), 233v-235r.

⁷⁷ Mersenne, *Harmonie universelle*, vol. III, book III, 172.

⁷⁸ Trichet, *Traité des instruments de musique*, 161.

⁷⁹ Emanuel Winternitz, *Musical Instruments and their Symbolism in Western Art* (New York: W.W. Norton & Comp., 1967), 57-65.

⁸⁰ *Ibid.*, 62.

⁸¹ Trichet, *Traité des instruments de musique*, 134-135.

⁸² Bonanni, *Gabinetto armonico*, 95: "Altri scrissero, che Apollo fosse l'inventore della Cetera, e che fosse simile al petto umano, e che poi ne procedessero diverse figure, e con diversità di corde, come si vedrà negl'altri Istromenti, onde vi sono le Cetera dette Tedesche, altre Francesi, Inglesi, Spagnole, Turchesche, e Persiane, le quali tutte armate di corde si suonano, ò con le dita, ò con il plettro, e tutte possono essere comprese con il nome di Cetera, essendo in tutte quelle la parte, che dalli Latini si dice Testudo, vacua nella parte interiore, e diversa nella forma, donde procede la varietà dell'armonia."

⁸³ Martin Litchfield West, *Ancient Greek Music* (Oxford: Clarendon, 1992), 64.

⁸⁴ Martha Maas and Jane McIntosh Snyder, *Stringed Instruments of Ancient Greece* (New Haven; London: Yale University Press, 1989), 203.

⁸⁵ It is interesting to note that the 1742 edition of Bianchini's *De tribus generibus instrumentorum* describes the *tympanum* being played using both hand and stick. This differs from the manuscript version in Bologna where the player only uses his hand. In Bianchini's 1742 text the method of playing the *tympanum leve* is described as: "genus commune tympanorum figura orbiculari, contextum pelle, vel corio superinducto: quae aliquando virgula percutiebantur, ut in bellicis tympanis fieri consuevit; aliquando manu impellebantur; qua ratione ad choreas passim adhibent nostrates rustici." (Bianchini, *De tribus generibus instrumentorum*, 47). However, the quote from the manuscript in Bologna reads differently: "genus commune tympanorum figura orbiculari, contextum pelle, vel corio superinducto: quae aliquando manu impellebantur; qua ratione ad choreas passim adhibent nostrates rustici."

⁸⁶ The merging between *tympanum* and cymbals may have also been inspired by the fact that different scholars note that the frame drum is still used by Italian peasants and is often called *cembalo*. Filippo Buonarroti, *Osservazioni storiche sopra alcuni medaglioni antichi all'Altezza Serenissima di Cosimo III Granduca di Toscana* (Roma: Stamparia di Domenico Antonio Ercole in Parione, 1698), 436: "Ma perchè per altro, come si è veduto, i centauri erano familiari ancora di Bacco; quindi è, che in quest'acquamarina finta se ne vede uno col tirso con una baccante addosso; la quale ha uno di quegli instrumenti, detti in Toscana, dove vi sono molto in uso particolarmente nel contado, cembali." Bianchini, *De tribus generibus instrumentorum* 48 on the *tympanum leve* says: "Cymbalum audit apud nostros populares ejusmodi organum".

⁸⁷ Lorenzo Pignoria, *De servis, et eorum apud veteres ministerijs, commentarius. In quo familia, tum urbana, tum rustica, ordine producitur et illustratur* (Augsburg: ad insigne pinus, 1613), 93.

⁸⁸ Johannes Scheffer, *De re vehiculari veterum* (Frankfurt: Officina Zunneriana. Typis Johannis Andreae, 1671), 43-44. This plate is also reproduced by Praetorius in his *Theatrum instrumentorum* (plates XL and XLI) to convey images of ancient drums. The interpretation of *tympanum* as a kettle drum comes from a passage in Plinius's *Historia naturalis*, where, when he is describing pearls, he says that hemispherical pearls are called *tympania*: "Quibus una tantum est facies et ab ea rotunditas, aversis planities, ob id

tympania nominantur", see Pline L' Ancien, *Histoire naturelle*, ed. by E. de Saint-Denis (Paris: Société d'Édition «Les Belles Lettres», 1955), book IX: 72. It is also important to note that Pignoria's kettle drum is very similar to those illustrated by Virdung when Sebastian explains military copper kettle drums of his time, see Sebastian Virdung, *Musica getuscht*, ed. by Beth Bullard (Cambridge: Cambridge University Press, 1993), 114-115.

⁸⁹ Febo Guizzi, *Gli strumenti della musica popolare in Italia* (Lucca: Libreria Editrice Musicale, 2002), 64-65; Febo Guizzi and Nico Staiti, *Le forme dei suoni: L'iconografia del tamburello in Italia* (Firenze: Comunità Montana Zona E, 1989), 25-27.

⁹⁰ The same that Bonanni has quoted in chapter XIX.

⁹¹ Giovan Pietro Bellori, Pietro Santi Bartoli, *Le antiche lucerne sepolcrali figurate: Raccolte dalle Cave sotterranee, e Grotte di Roma* (Roma: Stamparia di Gio. Francesco Buagni, 1691), plate 23.

⁹² Leonardo Agostini, *Le gemme antiche figurate* (Frateker: Leonardum Strik, 1699), plate 12.

⁹³ Giovanni Battista Casali, *De Veteribus Aegyptiorum Ritibus* (Roma: Typographia Andreae Phaeai, 1644).

⁹⁴ Benedetto Bacchini, *De Sistris, eorumque figuris, ac differentia* (Utrecht: Officina Francisci Halma; Academiae typographi, 1696).

⁹⁵ Montagu, *Musical Instruments of the Bible*, 48-50.

⁹⁶ Causei, *Romanum Musaeum sive Thesaurus*, vol. II, 9-11.

⁹⁷ Jacob Spon, *Miscellanea eruditae antiquitatis: in quibus marmora, statuae, musiva, toreumata, gemmae, numismata, Grutero, Ursino, Boissardo, Reinesio, aliisque antiquorum monumentorum collectoribus ignota, et hucusque inedita referuntur ac illustrantur* (Lyon: apud Thomam Amaury, 1685), plates XL and XLI.

⁹⁸ Pignoria, *De servis*, 91. We can find Pignoria's plate of cymbals also in Praetorius's *Theatrum instrumentorum* (plate XL) and in Mersenne's *Harmonie universelle* (Mersenne 1636), vol. III, book VII, 49.

⁹⁹ Friedrich Adolph Lampe, *De cymbalis veterum libri tres* (Utrecht: ex bibliopola Guilielmi a Poolsum, 1703).

¹⁰⁰ Spon, *Miscellanea eruditae antiquitatis*, plate XLIII.

¹⁰¹ For example Du Cange's *Glossarium mediae et infimae latinitatis*. See appendix.

¹⁰² Paola Elisabetta Simeoni and Roberta Tucci, *Museo nazionale delle arti e tradizioni popolari Roma: La collezione degli strumenti musicali* (Roma: Istituto Poligrafico e Zecca dello Stato, 1991), 73-84 and Guizzi, *Gli strumenti*, 22-23.

¹⁰³ Rubenius, *De re vestiaria*, 187.

¹⁰⁴ Bonanni, *Musaeum Kircherianum*, 177-78.

¹⁰⁵ Girolamo Mercuriale, *De arte gymnastica* (Venezia: apud Iuntas, 1601), 165.

¹⁰⁶ Bianchini, *De tribus generibus instrumentorum*, 57-58.

¹⁰⁷ Giampiero Tintori, *Gli strumenti musicali* (Torino: UTET, 1971), vol. I, plate LXXXV no. 1. See also *La Galleria Armonica. Catalogo del Museo degli strumenti musicali di Roma*, ed. by Luisa Cervelli (Roma: Istituto Poligrafico e Zecca dello Stato, 1994), 37 and plate 992.

¹⁰⁸ For example Fétis mentions Bartholin, Boulenger, and Lampe in his *Biographie universelle des musiciens et bibliographie générale de la musique*, but in music dictionaries and encyclopedias from the second half of the twentieth century they are not mentioned.

PICTURE CREDITS: LEONARDO AGOSTINI, *Le gemme antiche figurate* (Franeke, 1669). Biblioteca Comunale dell'Archiginnasio, Bologna <> BENEDETTO BACCHINI, *De sistris dissertatio* (Utrecht, 1697). Biblioteca Universitaria Bologna <> CASPAR BARTHOLIN, *De tibiis veterum et earum antiquo usu libri tres* (Roma, 1677). Biblioteca Comunale dell'Archiginnasio, Bologna <> GIOVAN PIETRO BELLORI, PIETRO SANTI BARTOLI, and MICHEL-ANGE DE LA CHAUSSE, *Le pitture antiche delle grotte di Roma, e del sepolcro de' Nasonj* (Roma, 1706). Biblioteca Comunale di Milano, Palazzo Sormani, Milano <> GIOVAN PIETRO BELLORI, PIETRO SANTI BARTOLI, ALFONSO CIACCONE, *Colonna Traiana* (Roma, s.d.). Biblioteca Nazionale Braidense, Milano, with permission of the Ministero per i Beni e le Attività Culturali <> GIOVAN PIETRO BELLORI and PIETRO SANTI BARTOLI, *Le antiche lucerne sepolcrali figurate* (Roma, 1691). Biblioteca Nazionale Braidense, Milano, with permission of the Ministero per i Beni e le Attività Culturali <> FRANCESCO BIANCHINI, *De tribus generibus instrumentorum musicae veterum organicae dissertatio* (Roma, 1742). Biblioteca Comunale dell'Archiginnasio, Bologna <> JEAN JACQUES BOISSARD, *Secunda pars antiquitatum romanarum seu topographia Romanae Urbis* (Frankfurt am Main, 1628). Biblioteca Nazionale Braidense, Milano, with permission of the Ministero per i Beni e le Attività Culturali <> FILIPPO BONANNI, *La gerarchia ecclesiastica considerata nelle vesti sagre* (Roma, 1720). Biblioteca Comunale dell'Archiginnasio, Bologna <> FILIPPO BONANNI, *Musaeum Kircherianum, sive, Musaeum a P. Athanasio Kircherio in Collegio Romano Societatis Jesu* (Roma, 1709). Biblioteca Nazionale Braidense, Milano, reproduced with permission of the Ministero per i Beni e le Attività Culturali <> FILIPPO BONANNI, *Gabinetto armonico pieno d'istromenti sonori indicati e spiegati* (Roma, 1723). Biblioteca Nazionale Braidense, Milano, reproduced with permission of the Ministero per i Beni e le Attivi-

tà Culturali <> FILIPPO BUONARROTI, *Osservazioni istoriche sopra alcuni medaglioni antichi all'Altezza Serenissima di Cosimo III Granduca di Toscana* (Roma, 1698). Biblioteca Sormani, Milan <> GIOVANNI BATTISTA CASALI, *De urbis ac Romani olim imperii splendore* (Roma, 1601). Biblioteca Nazionale Braidense, Milano, reproduced with permission of the Ministero per i Beni e le Attività Culturali <> MICHEL-ANGE DE LA CHAUSSE, *Romanum musaeum sive Thesaurus* (Roma, 1746). Biblioteca Comunale dell'Archiginnasio, Bologna <> FRANCESCO DE FICORONI, *Osservazioni di Francesco de' Ficoroni sopra l'antichità di Roma* (Roma, 1709). Biblioteca Nazionale Braidense, Milano, reproduced with permission of the Ministero per i Beni e le Attività Culturali <> RAFFAELE FABRETTI, *De columna Traiana* (Roma, 1683). Biblioteca Comunale dell'Archiginnasio, Bologna <> GIUSTO LIPSIO, *De militia romana* (Antwerp, 1598). Biblioteca Comunale di Milano, Palazzo Sormani <> BERNARD DE MONTFAUCON, *Diarium Italicum* (Paris, 1702). Biblioteca Trivulziana, Milano <> ATHANASIVS KIRCHER, *Musurgia universalis* (Roma, 1650). Milan, Biblioteca Nazionale Braidense, Milano, reproduced with permission of the Ministero per i Beni e le Attività Culturali <> ONOFRIO PANVINIO, *De triumpho* (Leiden, Utrecht, 1699). Biblioteca Universitaria Bologna <> LORENZO PIGNORIA, *De servis* (Augsburg, 1613). Biblioteca Comunale dell'Archiginnasio, Bologna <> ALBERTUS RUBENIUS, *De re vestiaria* (Antwerp, 1665). Biblioteca Comunale dell'Archiginnasio, Bologna <> FORTUNATO SCACCHI, *Sacrorum Elaeochristaton Myrotecia tria* (Amsterdam, 1710). Biblioteca Nazionale Universitaria, Torino <> JACOB SPON, *Miscellanea eruditae antiquitatis* (Lyon, 1685). Biblioteca Comunale di Milano, Palazzo Sormani <> FILIPPO TOMASINI, *De donariis* (Leiden; Utrecht, 1699). Biblioteca Nazionale Braidense, Milano, with the permission of the Ministero per i Beni e le Attività Culturali.

NOTE ABOUT THE FOLLOWING TRANSCRIPTIONS: The chapters of *Gabinetto armonico*, included in the left column, are transcribed unabridged. In the right column are passages that Bonanni effectively used, transcribed from sources he mentioned. Passages in Hebrew and most sections of the Greek text that Bonanni quoted have been omitted because he always worked with Latin texts and never wrote in either Hebrew or Greek. I hope that philologists will excuse me for having made only diplomatic transcriptions. A proper edition of the texts quoted by Bonanni requires a different kind of knowledge than what is needed to understand his work.

SOURCES

JEWISH INSTRUMENTS

ATHANASIVS KIRCHER, *Musurgia universalis* (1650)

Ars magna consoni et dissoni, libro II, cap. IV:

De musica antiqua Instrumentisque Hebraeorum, et qualia illa fuerint, p. 48

Inter coeteros igitur Hebraeorum Authores exactè huiusmodi Instrumenta tractat Author Schilte haggibborim; qui Sanctuarij diversa Musica instrumenta fuisse ait numero 36. quorum omnium pulsandorum Artifex fuit David; verba adiungo:

Memoratur David 36. Instrumentorum musicorum pulsandorum notitiam habuisse; et ibidem: [omissis] Id est: scripserunt Patres nostri quoddam cantica et sonationes domus Sanctuarij fuerunt plurimae, memorant enim 22. diversa instrumentorum genera, quorum omnium pulsandorum notitiam tenebat Rex David, pax super eum. Et Saadias in Daniele illi 36 Instrumentorum notitiam tribuit. Tractatus Aruchin Thalmudicus 34 eorum numerat. Quae omnia ut ex confusione sua in ordinem harmonicorum redigantur à plyphordis, quae Hebraeis Neghinoth appellantur ordiemur.

I. De Instrumentis Hebraeorum Polychordis, sive neghinoth, pp. 48-49

Neghinoth Hebraeorum instrumenta, quae manu vel bacillis aut plectro pulsantur, fuisse, vel ipsum verbum [omissis] quod idem est ac pulsare satis superque declarat; Schilte haggibborim ita ea describit cap. 4. [omissis] Et Neghinoth, inquit fuerunt instrumenta lignea longa et rotunda et subta ea multa foramina tribus fidibus constabant ex intestinis animalium, et cum vellent sonare ea, radebant fides cum arcu compacto ex pilis caudae equinae fortiter astrictis, in graeco dicitur *trichordon*, in latino *trifidium*. Instrumenta verò Neghinoth fuerunt Psalterium Nablum, Cythara sive quod idem est *Assur, Nevel, Kinnor, Maghul, Minnim*, de quibus singulis breviter aliquid dicendum est.

Psalterium Davidicum quale fuerit, nemo rectè adhuc definivit, credunt aliqui non tam fuisse instrumentum, quàm certa quaedam harmoniae genera denotare, et vocis, sonique modulationem; Iosephus duodecim sonos id habere tradit ac digitis carpi.

Hilarius, Didymus, Basilius, Eutymius omnium vocant organorum musicorum rectissimum nihil in se perversum continens, aut obliquum, quod in superiori parte pulsaretur: Unde videtur cavo testudinis caruisse; Augustinus ait manibus portari percutientis, et superiori parte habere testudinem, illud scilicet lignum concavum, cui chordae innitentes resonant, sicuti Cytharae habent infernè. Hieronymus describit hoc organum in modum quadrati clypei cum 10. chordis; Hilarius idem vult esse quod *Nevel*, sive *Nablum*, certum enim est Psalterium chordis instructum fuisse, et psallendi verbum significat, Suida teste, summis digitis chordas carpere; Magna Musicorum pars, ipsi similitudinem Harpae nostratis tribuit, quam et passim eius imagini appingere solent triangulari forma, quam Apollodorus apud Athenaeum vocatam ait *μάγαθιν*, Aristoteles *τρίφωνον*; Suidas Sambucam. Quo sit, ut in psalterio chordae inaequales essent, quod et de Sambuca Porphyrio in vetere lexico tradit. Nonnulli idem hoc esse psalterium ae *Nablum* ex illo Ovidij 3. de arte dicunt:

*Disce etiam duplici genalita nablum palma
Verrere, conveniunt dulcibus illa modis.*

Huic consonat quod Schilte asserit, ait enim *Nevel* instrumentum fuisse fidicinum fidibusque 22. in tres octavas fuisse diremptum; *Assur* autem chordis 10. *Kinnor* 32. *Machul* 6. *Minnim* 3. aut 4. constitisse fidibus: *Nevel* instar trapezij fabricatum, *Kinnor* verò ad instar hodiernae Cytharae similitudinem; *Machul* et *Minnim*, ut Violam et Chelym. Verum ne in instrumentis *Neggmoth* recensendis fusior sim, hic ea ex antiquo codice Vaticano deprompta Lectori communicanda duxi, ubi psalterium sub forma A exhibetur, *Kinnor* sub B, *Machul* sub C. *Minnim* sub E. *Nevel* sub I. refertur. Mersennus verò Cytharam novam et antiquam sub alia figura determinat. Apparetque eam similitudinem habuisse nostrae Harpae in trisdia pason per tres octavas 24. chordis distinctam. Qualis verò fuerit mysticum illud decacordon, triplicis mundi harmoniam referens, tum alibi, tum in Musica nostra hieroglyphica fusiùs describetur.

Haghniugab instrumentum fidicinum (eius mentio fit in Thargum tam *Onkelos*, quam *Vizielidis*,) erat *Cheli* maiori, quam, vulgo *Viola gamba* vocant, haud ab simile, et 6. chordis constabat. Vide R. Hannase cap. 10. Schilte haggibborim; confunditurque passim cum *Machul*; differunt enim tantum in numero chordarum.

FILIPPO BONANNI, *Gabinetto armonico* (all transcriptions are from the 1723 edition)

Capo I, *Della Varietà degl'Istromenti Musicali usati nel Tempio, e difficoltà nel poterli descrivere*, pp. 9-13

Che fossero adoperati molti Istromenti nel Tempio degl'Ebrei, non si può dubitare; poichè come notò l'erudito Pompeo Sarnelli a carte 54. della lettera nona, riferiscono S. Gio. Grisostomo sopra il Salmo 150. e Isidoro Peleusiota nel lib. 2 cap. 176. ch'era permesso il suono col canto nella Chiesa a gl'Ebrei, come apparisce nel libro I. delli Paralipomeni nel capo 15., e 16. perchè con ciò si rimediassero alla loro debolezza, e non fossero allettati dalle Musiche, che si celebravano in onore degl'Idoli dalli Gentili, che perciò soggiunse Teodoro sopra il salmo 50. usavano Istromenti loro proprii. Quali poi, e quanti fossero dalle notizie seguenti si potrà arguire.

Fù curioso di saperli il P. Atanasio Kircher, che perciò scrisse nel suo libro della Musurgia tom. I cap. 4. del lib. 2. d'aver letto tutti li libri Ebrei sopra questa materia per averne la certa notizia, e riferì, che di essa ne trattò esattamente il Rabbi Shilte Hagibborim, il quale affermò, che nel Santuario furono 36. diversi Istromenti, delli quali fù autore il S. Rè David. *Memoratur David* (dice egli con parole tradotte dal Testo Ebreo) *triginta sex Instrumentorum pulsandorum notitiam habuisse*. Altri ne riferiscono 22. nel genere d'Istromenti battuti, e Sandias sopra Daniele, ne numerò 36. Il trattato Aruchin Talmudico ne riferisce 34., e specificandone alcuno, la prima Classe di essi detta *Neghinoth*, comprende gl'Istromenti di corde descritti colle seguenti parole. *Schilte haggibborim fuerunt Instrumenta lignea longa, et rotunda, et subta ea multa foramina, tribus fidibus constabant ex intestinis Animalium, et cum vellent sonare ea, radebant fides cum arcu compacto ex pilis caudae equinae fortiter astrictis in greco dicitur Trichordon in latino Trifidium.*

Instrumenta verò Neghinoth fuerunt Psalterium, Nablum, Cythara, quod idem est Assur, Nevel, Kinnor, Maghul, Minnim. Quali poi fossero questi, non è cosa facile a determinarsi, mentre non si spiegano più chiaramente. Se si parla del solo Salterio usato da David, non si trova bene spiegato da alcuno, anzi molti crederanno, che non fosse vero Istromento da suono, ma solamente una certa armonia cagionata dal suono, e dalla voce. Giuseppe Ebreo però asserì, che significasse Istromento di dodici corde, e ch'è si suonasse con le dita; S. Ilario, Didimo, e S. Basilio con Eutimio lo dissero Istromento perfettissimo, e sopra tutti gl'altri eccellente; S. Agostino affermò che era Istromento portato dalle mani del suonatore, e che aveva la testudine, cioè la parte convessa, in cui si rifletteva il suono nella parte superiore, come la Cetera l'ha nella parte inferiore; S. Girolamo disse, che aveva figura quadrata con dieci corde; La più commune opinione è che si suonava con le dita, e simile all'Arpa oggidì usata, che perciò si suole dipingere il S. David con tale Istromento, il quale stimano alcuni essere lo stesso che il significato della parola *Nablum* appresso Ovidio 3. *de Arte.*