The expansionist conquests of Ottoman power in sixteenth-century Europe caused a profound disarray that changed Western representations of the world order on a long-term basis. The imposing military orchestras which preceded Turkish troops on the battlefield or accompanied official delegations made a great impression and went on to exert two centuries of influence on artistic creation. The recent study of one of these orchestras—brought to Venice by the admiral Francesco Morosini around 1690 after a victorious military campaign in the Peloponnese—offers an unprecedented potential for historical investigation both in terms of organology and of the science and technology of materials. The multidisciplinary approach of the conference held at the Musée de la musique - Cité de la musique in Paris brought together historians, curators and scientists around this exceptional Ottoman military band.

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Music of Power
Power of Music

A seventeenth-century Venetian trophy: an Ottoman military band
Edited by Philippe Bruguière
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The doge's zurna
A new contribution to the history of the forked shawm

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Conservator

Abstract
The present article will describe the two Ottoman shawms (zurnas) preserved at the Correr museum in Venice, contextualising their presence within the Military band that was brought to Venice in 1690 as a war chest by Francesco Morosini. A first comparative study with similar instruments kept in several museums (Musée de la musique, Paris; MIM, Brussels; MFA, Boston; NMM, Vermeil; Bate Collection of Musical Instruments, Oxford) will allow some Turkish-Ottoman building features to be identified and their provenance to be confirmed. Additional analyses such as radiography, wood identification and radiocarbon will provide essential information to date and to analyse the instruments. This paper will bring evidence that confirms the age of the two Turkish-Ottoman zurnas with a conical bore and a “fork” mechanism, dating from before 1690. In the present state of the art this is the most ancient statement of a “fork” mechanism found in a zurna.
In 1688 admiral Francis Morosini, the last great Venetian military hero was elected doge, the highest political-religious office of the Serenissima, while he was still engaged in the war against the Turkish Morea. Only two years later, in 1690, he returned in triumph to Venice to receive his ordination as doge, taking with him a large war chest including, within the Turkish arms, a few dozen musical instruments, in large part metal body kettledrums (at the present day 37 musical instruments, one drum stick and an iron bowl are preserved at the Correr museum) that belonged to a royal mehter band, as attested by the presence of big kettledrums called koo [Fig.1].

This Ottoman military band is composed of the following items:

- two cura zurnas (double reed shawm with conical or cylindrical bore) [Fig.2]
- two flared bells of baroque shawms (Deutsche Schalmei)
- six koo (large kettledrums of 50 cm of diameter)
- 15 tablahz (small kettledrums, the skin is held in tension on small metal pins fixed all around the circumference of the body)
- ten naqqaras (small kettledrums, the skin is held in tension with leather strips)
- one iron bowl, similar to a naqqara, but not proved to be a musical instrument
- one pair of zil (small cymbals)

Upon the death of the doge in 1694, an inventory (9 July 1694) was made of the arms stored in the rooms of the palace—this inventory was fully transcribed during the recent studies on the collection [Viero 2013, 107-13]. Among many Turkish rifles different types of object also appear: candelieri d’ambra, cuori d’ambra, immagine di beata vergine col suo bambin in una cassetta, and some musical instruments: timpaneti due d’otton a capelo n.2 and detti [“timpaneti”] di rame due non dorati e uno dorato n.3. Comparing their written description with the instruments preserved today, the only one that can be identified exactly is the kettledrum inventoried as 62c, as it is the only gilded one of the collection [Fig.3].

1 The koo was only ever played by royal mehter bands, or in that of the commander-in-chief leading the army in lieu of the sultan when on campaign. See http://www.turkishculture.org/music/military-mehter-86.htm

2 The prototype of kudum is the Arabian boru, a bell-bodied kettledrum. In Turkish it is called tablahz [“…” Tablahzlar and other kettledrums related to them were also used in orchestras called mehterhane, tablhane, nakarhane, and nakare” [Pennanen 1994-1994, 4].

3 The term yeniceri means “new troops” or “new soldiers” and it refers to the elite troops of infantry—as well as personal guards of the Sultan—created in the mid-fourteenth century by Murad I (1326-1389), the first sultan of the Ottoman Empire, whose reign lasted from 1361 to 1389. Murad I was the son of the Bei Orhan (1281-1362). The Sultan Mahmud II dissolved the corps in 1826, after the rebellion of the soldiers.
Fig. 1. Kuo, Correr museum, inv. n. 60a. © Fondazione Musei Civici di Venezia-Museo Correr and Ministero per i Beni e le Attività Culturali-Direzione Regionale per i Beni Culturali e Paesaggistici della Lombardia

Fig. 2. The two zurna, Correr museum, inv. n. 50 (left), inv. n. 48 (right). © Fondazione Musei Civici di Venezia-Museo Correr and Ministero per i Beni e le Attività Culturali-Direzione Regionale per i Beni Culturali e Paesaggistici della Lombardia

Fig. 3. Tablaz, Correr museum, inv. n. 62c. © Fondazione Musei Civici di Venezia-Museo Correr and Ministero per i Beni e le Attività Culturali-Direzione Regionale per i Beni Culturali e Paesaggistici della Lombardia
The **zurna** is a double-reed instrument with cylindrical or conical bore, usually in fruitwood, very common in North Africa, Asia and the Balkans (part of the former Ottoman Empire), with building features and denominations varying from region to region (**zurna, sorna, shahnai, zurla, ghayta, mizmar, zumr**, etc.). If some of the building features are widespread, as for example the shape of the instrument, others such as the reed, the presence and the shape of the pirouette, the position and the number of the holes, dimensions and materials can vary considerably.

Although it is generally used outside for ceremonies and public or private occasions, we also find statements of a court tradition in the miniatures of the Turkish painter Abdulcelil Levni, in 1720, illustrating the ceremonies for the circumcision of the four sons of Sultan Ahmed III [Fig.4]. This typology of instrument has not changed during the last four centuries, if we exclude the last fifty years wherein composite materials have been used. For this reason, and in the absence of complex decorations or other useful identification features, it is extremely hazardous to date a **zurna** by simple observation or through a stylistic study.

According to their building features, a comparison between the **zurna** kept at the Correr and the ones preserved at the Musée de la musique in Paris, the Musical Instrument Museum (MIM) of Brussels and several other museums, confirmed the Ottoman origin of the Venetian instruments. One of the most complex problems to compare **zurna** is the lack of instruments dated with certainty before the end of the eighteenth century. It is to be noted that the typical features of the Turkish-Ottoman instruments are:

- a cane (**Arundo Donax**) double reed
- a fruitwood body, apricot wood was the best quality instruments
- a boxwood staple holder
- the best ones are turned, the others hand-carved with a curved knife
- seven wide holes on the front and one wide thumbhole, placed on the back, at level between the first and the second hole
- seven small tone holes (or acoustic or devil’s holes) on the bell. These holes are traditionally used by musicians to “tune” the instrument, closing or open them with wax
- a wide flared bell
- a “fork” at the end of the staple holder
- the absence of decorations (metallic plates, small chains, stones)
- three different sizes
Fig. 5 Staple holder of the *zurna* showing the fork mechanism, Correr museum, inv. n. 50. © Fondazione Musei Civici di Venezia-Museo Correr and Ministero per i Beni e le Attività Culturali-Direzione Regionale per i Beni Culturali e Paesaggistici della Lombardia.

Fig. 6 Radiography of the front (left) and the side (right) of the *zurna* inv. n. 50 from the Correr museum. © Musée de la musique, Paris.

Figs. 7a-7b 10x magnification in visible light (a) and in UV fluorescence (b) of one of the repaired cracks on the *zurna* inv. n. 50 from the Correr museum, showing the glue used for the consolidation. © Musée de la musique, Paris.
The two *zurna* of Correr museum

Two instruments are kept in the museum, which could almost be described as identical or “twin” from a dimensional and stylistic point of view. The construction of both reflects a highly skilled craftsmanship. They present a turned conical bore, seven wide finger holes, a thumb-hole on the back, seven small tone holes on the bell (three on the front and two on each side) and a staple holder ending with a “fork” [Fig.5]. Staples, piroquettes and reeds are missing. In addition to the “standard” Turkish-Ottoman features, we can observe that:

1. The quality of the turning is very fine and the internal bore examined with X-rays is perfectly executed, unlike most of the instruments observed with the same method. It should also be remembered that this was an instrument built for an elite military band [Fig.6].
2. The dimensions of the finger holes are larger than in the other instruments observed. They have an average size of 7.8 x 8.4 mm (width x height), while the other instruments show a smaller overall extent of the holes of 1 mm. A larger hole could allow a greater freedom of intonation, but also make the instrument more difficult to play.

The conservation conditions are very different, part of the body of the first instrument is damaged while the second is still in its entirety. We don’t know if the first instrument arrived in Venice in good conditions and if its present state may be the consequence of later causes but a photography showing the two *zurna* in Morosini’s home clearly indicates that one of them was already damaged (see supra Tonini). Both were restored in 1995; the interventions aimed to consolidate the fragments of the first instrument’s bore and the numerous cracks of the second (the one studied and described in the present article is the complete one) [Fig.7a-b].

As stated above, stylistic analysis confirmed a Turkish-Ottoman provenance and an additional element validating this hypothesis is the wood identification that certifies the use of apricot wood (*Prunus Armeniaca*) for the instrument and boxwood for the staple holder (*Buxus*)—in fact the woods traditionally used for the best quality instruments [Fig.8]. However, as it is generally considered that the boxwood (with the terminal part, shaped as a “fork”) is an element that appeared later and only on instruments with cylindrical bore, a question arose as whether it was possible this staple holder

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4 In the restoration report we read: “Internal and external cleaning, consolidation of the fractures and conservative treatment of the surface”, no information is given about the materials used. The restorer Francesco Li Virghi told me that he probably used ammonia to clean the instrument, epoxy resin (Araldite) to consolidate the fractures, and linseed oil to protect the inner and outer surface. No images of this intervention exist.
was original or not, knowing it is a removable part of the instrument that can be lost, broken or substituted [Montagu 1997, 78].

To try to answer that question, we asked to Dr. Tomasz Goslar of the Poznan Radiocarbon Laboratory for a preliminary simulation of what calibrated 14C dates could give in the time window we wanted to analyse. With the authorisation of the Correr museum, it was decided to take two micro samples of the body and one of the staple holder from the damaged instrument (a large part of the bore is missing) and to analyse them with the radiocarbon dating. The results obtained were noted by Dr. Goslar as follow:

The dates of the pieces made from apricot wood both indicate rather young age [... ] the only probable period is between 1662 and 1690 (first sample) or between 1646 and 1690 (second sample). The piece made from buraš wood seems older and calibration of its 14C age gives two periods: 1429-1518 AD (probability of 80%) or 1594-1619 AD. Assuming that all the parts of the instrument were produced at the same time, I would claim that the period 1594-1619 AD is much more realistic here.

We can therefore reasonably state that the two zurna are indigenous of Ottoman culture and date to between 1660 and 1690. It is essential to stress that: a) both parts of the studied instrument date back to the same period; b) the fork mechanism is “original”; c) it is the oldest known example of fork mechanism; d) the fork mechanism is used with a conical bore; e) the presence of the fork mechanism, dated by the 14C analysis allows us to say that the appearance of this mechanism goes back, at least, to the first part of the seventeenth century. Those two instruments thus represent an extremely important historical witness for the study of the shawn.

How the fork mechanism works?

The staple holder can turn on itself. If turned 90°, the fork mechanism at its lower extremity can close the first and the second hole as well as the thumbhole [Fig.9]. The closing of the holes modify the instrument’s range and allows the musician to play with just one hand. This hypothesis is supported by the tradition of târogâbî, a double reed instrument very similar to the zurna, with a fork mechanism to close the holes and which is played by the musician on a horse [Pap 1999, 341-52]. The shape of the fork mechanism causes the narrowing of the upper part of the bore, increasing its conicity. The bore plays an important role in the acoustic behaviour of a wind instrument, while a stopped cylindrical-bore instrument (the clarinet for example) overblows at the twelfth, a conical one (such as the shawm) overblows at the octave.

The traditional hypothesis about the fork’s role [Pickens 1975, 11-12; Montagu 1997, 76-8] is that the mechanism contributes to make conical a cylindrical bore, with all the above-mentioned effects; acoustic analyses described in the present proceedings (see infra Le Conte) will illustrate the role of this device (called in almost all languages “tongue”) that has an important part in the instrument’s musical colour.

Conclusion

The two zurna arrived in Venice in 1690, along with kettledrums and cymbals, as part of the war chest of the Admiral Francesco Morosini. These instruments were part of a mehterhane, a royal military band, as proved by the presence of the hudge koś kettledrums (used only in the Sultan’s mehter). The zurna are almost identical, turned and perfectly executed. The studies and the analyses allowed, established their Turkish-Ottoman provenance as well the nature of woods used for the body (Prunus Armeniaca) and for the staple (Buxus). Moreover, the radiocarbon technique indicated that the instruments were made between 1660 and 1690 and further confirmed the original authenticity of the staple.

The dating also confirmed that the instruments are the oldest known Turkish-Ottoman zurna; consequently the appearance of the fork mechanism can be dated back at least at the middle of the seventeenth century, contributing to a better knowledge of the “forked shawms”.

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[Fig.9]