The Sphero-conical Vessel: A Difficult Interpretation between Historical Sources and Archaeology

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Introduction

The research programme “Wars, Cultures and Societies” that I ran with my colleagues, Abbes Zouache and Mathieu Eychenne, included a section on “material culture.” It is within the framework of this programme that I organized a Study Day with the assistance of Julie Monchamp. Our Study Day aimed to take a look at two issues: the sphero-conicals and the use of firearms in the Islamic World. The objective was to bring together many experts on this kind of ceramic as well as on war in the medieval Islam in order to assess our knowledge not only of sphero-conical vessels (“sphero-conicals”) but also on the use of fire grenades in the East. Discussing the subject of sphero-conicals also meant that the study of the use of Greek fire and gunpowder in Muslim cultures had to be re-opened. The use of firearms in the medieval Middle East is a subject not adequately-explored.

The six articles presented in this special edition of the Journal of Islamic Archaeology were part of the Study Day held on the 17th of December 2014 at the French Institute of Oriental Archaeology (the “IFAO”), Cairo and entitled “the Sphero-conical vessel: A debate on fire grenades and gunpowder in the Muslim World.” This seminar also included two important oral communications: Robert Elgood (SOAS, London) “Powder and firearms in Islam, an introduction” and Abbes Zouache (Ciham, UMR 5648, Lyon), “Les grenades incendiaires et leur utilisation au Proche-Orient (Ve/Xe –Xe/XVIe siècles): l’apport des sources narratives et didactiques.” These communications, which fall outside the purely ceramic framework, will be the subject of separate publications.

The sphero-conical can be described, in brief, as a dense high-temperature fired clay, almost stoneware object. It has a strong and thick body, which is most often
covered with a grey-brown slip and decorated with incisions, cuts (excisions) or moulded decorations, and, rarely, covered with a blue turquoise glaze. The length of the spherico-conical varies from 5cm to 30cm. It is always heart-shaped, with a round, almost spherical body, and with a pointed base and an opening in the upper part like a bottle. The opening is always extremely narrow with a short neck. These objects were found from Africa to Central Asia (Watson 2004, 130) and were used from the 9th to the 15th century. Historians have tried to explain the function of these spherico-conicals by means of primary sources. Archaeologists, meanwhile, have stuck to descriptions, morphological and classifications that were based on chronology. Various hypotheses have been raised with regard to these famous grenades/sphero-conicals. These hypotheses have evolved with time. What these objects were used for was mainly linked to Islamic Art research context rather than real scientific discoveries relating to the contents of these objects.

**Greek fire or hand grenades**

One of the first hypotheses, published in 1874, was that these objects were used as Greek fire (Saulcy 1874, 18–34). This was when Félicien Saulcy studied the 60 grenades that were found in Tripoli, Lebanon. These 60 spherico-conicals were arranged in a circle, with a solitary vase in the centre, identical in shape to the others but larger. One vase bore an inscription indicating that these objects had been manufactured in Hama, Syria. The presence of mercury was detected during the analysis of one of the vases and this backed up the hypothesis of a Greek fire-type of explosive whose main component is crude oil or naphtha. Saulcy likened these objects to incendiary grenades by comparing them with the Crusader sources. The majority of these objects were found in fortified cities, caravanserais and fortresses. The context of their discovery has backed up the hypothesis of these objects being used as “weapons of war.” Of course, this hypothesis must be put back into the context of the end of the 19th century. The period of the Romantic Movement and Orientalism made the Crusades fashionable.

In 1925, Friedrich Sarre also associated this object with an incendiary grenade or a hand-thrown bomb (Sarre 1925, 133–136). There is a wealth of literature in German on these objects in the context of war. This time, there is a new social context, the inter-war years between France and Germany. Several arguments run counter to the hypothesis that the spherico-conicals were incendiary grenades. One problem raised by Lane is that these stoneware objects are very hard and that, even if they are thrown against a wall, they do not break (Lane 1947, 27). Sauvaget supported the hypothesis of incendiary grenades, explaining that these objects were launched by mangonels (Sauvaget 1950, 525–530). However, this explanation is not any more convincing: why use huge siege machines to launch such small objects?

Another argument against the use of these objects as a weapon of war is linked to the decoration on these objects. On some there is moulded decoration, often incised and occasionally with inscriptions, or more rarely, with a turquoise blue glaze (Figures 1 and 2). This ornamentation runs counter to the function being solely as an incendiary grenade (Seyrig 1959, 81–89). Why decorate grenades that are intended to be
Figure 1. Sphero-conical with moulded, applied and incised decoration and a stamp with an Arabic inscription. Walls of Cairo, site of Darrasa, 2007.

Figure 2. Sphero-conical with moulded and incised decoration covered by a turquoise glaze. Walls of Cairo, site of Burg al-Zafar 2011.
broken? The argument put forward by the proponents of the hypothesis that spheroconicals were used as incendiary grenades is that, in the Muslim context, arms were always richly-decorated, and so there is no reason why the grenades would not also be decorated. This argument should be rejected for two reasons. Firstly, arms with decorations were not supposed to be used just once and then thrown away. Arms and armour were intended to be worn and then retained. Secondly, it was only the status and prestige weapons, which were religious or princely in nature, that were richly-decorated. And it is normally these weapons that are exhibited in our museums. The common arms of soldiers were not as richly-decorated.

Real incendiary grenades were discovered during a dig carried out by Monik Kervran, in at Sohar, 14th c. A.D. (Kervran 1993, 61). The object that was found in the Gulf was a small, flat based spherical vessel with an orange clay body and of medium thickness. There is no decoration on it. This type of object is not related to the sphero-conical family.

In this edited volume, David Nicolle remains true to the earlier interpretation that these objects are medieval Islamic Fire Grenades and presents us with further evidence from the military context. Remaining within the war context, but far from the fire grenade context, Stéphane Pradines puts forward a late military re-use of the sphero-conicals in 19th century Sudan. Finally, it is important to mention, within the military context, that the Ottoman primer or powder flasks very closely resembled the medieval sphero-conicals in both size and shape, with the main difference being that the Ottoman pieces were made of wood and decorated with brass inlays. They were used with firearms, long guns and pistols. This is the reason why it is highly improbable that they were used during the medieval period in the same way, even though their similarity needs to be observed within the Muslim military context.

**Transition and changes in the vocabulary**

In 1929, Wsewolod von Arendt proposed changing the word “grenade” to the more neutral word “spherisch konischen” (Arendt 1929–1931, 206–210). Arendt, and then Sarre in 1935, started to question the real function of these objects (Sarre 1935, 76–78): “Tongranaten oder Handbrandgeschosse?” This change in terminology and a more neutral approach enabled researchers to focus more on the shapes and decorations in order to produce the first typologies and start to try and create a chronological evolution of these objects. This word change also enabled researchers to propose new interpretations to investigate more functions for these mysterious objects. However, this approach is rather weak in that it is risk-averse and there is no decisive interpretation. Oliver Watson explains that the sphero-conicals served a multitude of specific purposes and he wrote that most of the interpretations may be correct. The sphero-conicals are considered to have multiple functions rather than a sole function. However, as pointed out by Watson, whatever the function, these vessels and their contents did have some social significance and high status (Watson 2004, 128–129). In this volume, Valentina Vezzoli follows this tradition by presenting the sphero-conicals from Baalbek. She claims that it is possible that these objects served various functions. Julie Monchamp introduces us to the sphero-conicals from the
Ayyubid wall of Cairo. Her typology from the 11th to the 15th century demonstrates a chronological evolution of the shapes throughout Egyptian medieval history.

Containers for alcoholic beverages

Another hypothesis originated after the Samarra’s excavations in 1940, where an inscription on one of the sphero-conicals read: “they fill us with matured wine.” It was proposed that the sphero-conicals were used as small bottles for wine. Unfortunately, Sauvaget demonstrated that the Arabic text was mistranslated and that in fact it was just a blessing (Sauvaget 1950, 525–530). He also added that the neck of the bottle was too narrow to let air pass through and therefore could have posed a problem when drinking. In 1959, Seyrig added that the inner sides of the sphero-conicals were too porous and highly absorbent and, hence, not intended to contain fluids, much less wine or beer (Seyrig 1959, 81–89). Plus, as previously mentioned by Sauvaget, these vessels would have been difficult to fill given the narrowness of the opening. However, the alcoholic beverage hypothesis was not abandoned. More recently in 1992, Ghouchani and Adle wanted to see them as jugs for beer or fuqqâ’a (Ghouchani and Adle 1992, 72–92). Another beer flask hypothesis in Mamluk Damascus is presented in this volume based purely on historical sources by Élodie Vigouroux.

Aeolipiles or fire blowers

A stronger hypothesis originated in 1951 when Hildburgh proposed to interpret the sphero-conicals as Aeolipiles (Hildburgh 1951, 27–55). This object blows a fire from steam. The Aeolipile is half filled with water and placed in the fireplace; boiled water then blows a spray of air onto the fire and rekindles the flames. This hypothesis was supported by Seyrig who explains that the majority of these objects were found in domestic contexts in Nishapur, Hama and al-Fustât. In addition, many inscriptions on these objects are blessings or they were female names which could allude to a domestic use (Seyrig 1959, 81–89). Finally, it was argued that these vases were very difficult to fill with any kind of liquid due to their very narrow openings. Dumarçay, in 1965 and Rogers, in 1969, supported the fire-blower hypothesis, which flies in the face of all technical expertise (Dumarçay 1965, 75–79 and Rogers, 1969, 147–158). This is also the opinion of Donald Whitcomb who agreed in this volume that most of them were fire blowers. Again, as with the fire grenades, the only possible objection is to say that objects placed in a fire are normally never decorated.

Alchemy and pharmaceuticals

In 1965, Ettinghausen proposed the interpretation that these vases, known as fuqqâ’a, were used to carry mercury. He made the connection between the decorative patterns on the vessels and the symbols and iconography of alchemy, and, in particular, the confronted snakes and the dragons. Ettinghausen argued that the sphero-conicals were mercury containers or related to alchemy (Ettinghausen 1965, 223–229). The mercury trail is an old one and it dates back to the end of the 19th century and to the publication by Saucy on the grenades founds in Tripoli, Lebanon (Saulcy 1874, 18–34). Traces of mercury had been detected during the analysis of one of the
vases. However, there is a problem in that if these vases were linked to the trade and transport of mercury, why was none found in the mercury mining areas, such as the mines in Spain? Nevertheless, this hypothesis is particularly interesting and should be extended to the use of spherico-conicals as containers for liquids or powders for pharmaceutical and medical purposes.

**Water-pipes**

A new interpretation was proposed by Edward Keall in 1993. The spherico-conicals could be water pipe vessels used before the introduction of tobacco. Muslims smoked hashish and other plants before the 16th century. Yemeni texts mention two kinds of smoking, the dry smoking and smoking with water. Keall views the spherico-conicals as water containers and he finds similar objects in some 17th-century Safavid miniatures (Keall 1993, 280–281). Known as Ghaliân in Persian, Hookah in Indian and Nârgile in Turkish, the first water pipes had a body made of a coconut, and are still called madâ’ah in Yemen from the Indian word for coconut. Keall thinks that the spherico-conicals are the ceramic versions of the coconut (Keall 1993, 1993, 282). This interpretation, although very attractive, falls down on three points. Firstly, Keall himself admits that, despite analyses, they didn’t find any traces of cannabinoids or opiates (Keall 1993, 281 and 285). Secondly, there are no spherico-conicals after the 15th century and the Mamluk period. Hence, everything he has demonstrated based on Safavid iconography is not really valid. Finally, the opening of the spherico-conical is too narrow for this type of use.

**Perfume flasks, odours and beauty**

A final hypothesis is related to the body of the object, but not to health issues this time, but rather to beauty, aesthetics and pleasure. In 1997, Adhal proposed that the spherico-conicals were used as containers for perfume or body oils that could be used in hammams (Sharvit 1997, 101–112 and Adhal 1997). This perfume bottle trail is an old and attractive proposal (Lane 1947, 27). The use of spherico-conicals as bottles for oils, musk and perfumes seems to be a valid hypothesis (Ettinghausen 1965, 229) especially if one compares the spherico-conicals to the ancient ointment and perfume bottles and the Greco-Roman balsam jars. Also, let us not forget the use of cosmetic powders, such as kohl powder, for protection against eye ailments. The precious liquids contained within were poured drop by drop, which ties in with the diameter of the opening being so small. The liquids and cosmetic powders are also linked to alchemy and this can sometimes be extended to include medical purposes (Sharvit 1997, 101–112). The cosmetic and/or medical use would explain why these objects were decorated like the turquoise glaze and fritware spherico-conicals from 12th-century Iran published by Watson and, according to him, were probably used as perfume atomisers (Watson 2004, 132). We should mention here that other spherico-conicals were made of glass (Figure 3). A particularly famous one is a sprinkler made in Egypt or Syria for al-Malik al-Ashraf Abu'l-Fath 'Umar, who ruled Yemen from 1295 to 1296 A.D. (Victoria and Albert Museum, London, C.153–1936). The blue glass is adorned with enamel and gilt decoration and an Arabic inscription. It was argued that it was
used as an atomiser for some precious liquid. In this volume, I (Pradines) propose a new interpretation of the sphero-conical vessels as objects linked to the Indian Ocean’s spice and perfume trade.¹

**What is the next step for future research?**

In November 2016, just few months before the publishing of this volume, we found in Cairo one sphero-conical with a stamp bearing an Arabic inscription (Figure 4). According to our colleague Frédéric Bauden, the inscription that was discovered on the city walls excavations, is not a proper noun but two words that are probably related to the function of the object.

\[ \text{و السبر والحسس} \]
\[ \text{“al-sabr wa al-hasīs”; “probing and crackling”} \]

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¹ The sphero-conicals found in Central Asia coming from the Persian harbours through the Silk road
The first word is not clear and thus lends itself to several interpretations. This word refers to the exploration done by means of a probe (for example, the surgical probe used when referring to the human body). It could also be read as ‘al-sharr’ (illness, fever). The second word seems quite clear (the other possibility, al-hashish, seems to be rather unrealistic, given the nature of the object). It refers to a faint sound that is produced by something that can’t be seen, so it could either be the hissing which is produced by a flying object, or equally the sound of crackling fire.

More than one answer, our inscription can support several interpretations presented in this volume: al-hasis can refer to the noise produced by Greek fire, incendiary grenades, aeolipiles or fire blowers; al-hashish can refer to water-pipes; finally al-sabr or even al-sharr can refer to medical or pharmaceuticals unguents.

Clearly our contributions in this volume will not answer the question of what these sphero-conicals were exactly. Art historians, archaeologists and historians are sticking to their hypotheses: whether it is fire grenades, fire blowers, perfume bottles or containers for alcoholic beverages. Ceramologists prefer to remain in the descriptive mode, which is useful when it is possible to distinguish between regional or chronological patterns. We should ask other questions about these objects, not only for what they were used, but also what objects people used before the sphero-conicals and which objects replaced them and why.
Three important things need to be done: mapping, dating and analyses. It is urgent to map where these objects have been found. Sphero-conicals were found in Uzbekistan, Iran, Syria and Egypt and even in Sub-Saharan Africa, as per our Sudanese example. It is also important to show the places where these objects are absent. The idea is to map the area where these objects were used to determine not only the trade routes but also how far they had spread. As of now, none of these objects has been found in East Africa on the Swahili coast or in the Western Mediterranean. Are there sphero-conicals on the Indian shores? Once we have an accurate map then it will be easier to interpret the use of these objects with regard to potential trade or usage. Sphero-conicals have been found throughout the Muslim World, most frequently in a 12th–13th-century context, and many of them are attributed to the Mamluk period. Nevertheless, sphero-conicals were found before then, during the Abbasid, Fatimid and Ayyubid periods. The lifespan of the sphero-conical is roughly from the 9th to the 15th century. The sphero-conicals disappeared at the end of the Mamluk era, because their use had lost their relevance and this was probably for two main reasons: firstly, they were replaced by other containers; and secondly, the material that they contained had either changed or was no longer in use. Accurate dating is important in order to understand both when this object started to emerge and from where, and also to see how it evolved in terms of its shape and decoration and finally how and when this object disappeared. A final stage is to do physical and chemical analyses of complete sphero-conicals which could still contain some remains of their contents. A final word for the archaeologists: don’t wash these objects and then try to carry out analyses on the material inside them.

References


2. New projects and analyses are ongoing by Omri Danziger, Institute of Archaeology of the Hebrew University of Jerusalem (Katia Cytryn-Silverman, personal communication 03/11/16) and by Renata Holod in her project “Eric Schmidt at Rayy: Excavations, Methods and Materials,” personal communication 03/11/16.


