






Research Article

The Chinese identity of St Mark's bronze 'Lion' and its place in the history of medieval Venice

Gilberto Artioli¹ , Roberto Ciarla², Ivana Angelini³ , Valentina Cantone³, Antonella Gnutti⁴ & Massimo Vidale^{2,3} 

¹ Dipartimento di Geoscienze, Università degli Studi di Padova, Italy

² International Association for Mediterranean and Oriental Studies (ISMEO), Roma, Italy

³ Dipartimento dei Beni Culturali, Università degli Studi di Padova, Italy

⁴ Independent researcher, Brescia, Italy

Author for correspondence: Massimo Vidale ✉ massimo.vidale@unipd.it



There are no known written records pertaining to the origins of the enigmatic bronze 'Lion' that stands atop one of the two large columns of the Piazzetta in St Mark's Square, Venice (Italy). Representing the Venetian Winged Lion, a powerful symbol of statehood, the sculpture was installed during a time of political uncertainty in medieval Mediterranean Europe, yet its features do not reflect local artistic conventions. Here, the authors argue that stylistic parallels are found in Tang Dynasty China (AD 618–907); employing lead isotope analysis, they further show that the figure was cast with copper isotopically consistent with ore from the Lower Yangzi River basin.

Keywords: Mediterranean Europe, Italy, medieval, lead isotope analysis, Tang art, political symbolism

Introduction

Much speculation surrounds the origins and cultural identity of the large bronze 'Lion' that tops one of the two large columns in the Piazzetta by St Mark's Basilica in Venice (Figure 1). Hypotheses on its origins include a twelfth-century AD Venetian foundry (Pilutti Namer 2013) or an unspecified location in Anatolia or northern Syria in the Hellenistic period (323–30 BC) (Ward Perkins 1947; Wills 1999), with possible Romanesque, Gothic, Assyrian, Etruscan, Sassanian and Chinese influences (Elam 1990). B.M. Scarfi (1990) viewed the 'Lion' as a Hellenistic interpretation of

Received: 25 September 2024; Revised: 30 March 2025; Accepted: 2 April 2025

© The Author(s), 2025. Published by Cambridge University Press on behalf of Antiquity Publications Ltd. This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted re-use, distribution and reproduction, provided the original article is properly cited.



Figure 1. The great bronze 'Lion' of St Mark's Square, Venice (Scarfi 1990). The statue is about 4m long from muzzle to tail and 2.2m high at the head.

Mesopotamian or Persian lion-headed griffins, made in the fourth or third centuries BC as the vehicle of Sandon, deity of the city of Tarsos in Türkiye, who was depicted on coins standing on a big horned cat. In this article, in contrast, we argue that the St Mark's Lion was originally a monumental Chinese bronze, heavily modified by later adjustments. Similarities in the morphology of the snout and stylistic features of Tang Dynasty (AD 618–907) renderings of lions have already been noted, as have the scars left by the removal of horns (Scarfi 1990: 72, fig. 58). Here, we reappraise this stylistic comparison, drawing on the results of lead isotope analyses to identify a Lower Yangzi origin for the metal alloys that compose the original bronzework.

Evolution of a super-symbol

According to Tigler (2000: 3) the large columns of the Piazzetta arrived in Venice not much earlier than AD 1261, and were erected a few years later, with the bases and capitals sculpted on site. The column supporting the lion is made of a violet granitoid rock from north-western Anatolia (marmor troadensium) (Lazzarini 2010). Yet, the only historical documents mentioning St Mark's Lion on its column are dated 14 May 1293, when the sculpture was already damaged and needed restoration (Cessi 1931: 339). The

next precise historical information we have deals with its removal to Paris in 1797 by Napoleon, as a symbol of the defeat and humiliation of Venice, and its return in pieces from there in 1815 (see below). The final restoration of the sculpture (Catra 2014), with new wings, then added to a complex micro-history of discontinuous, sequential castings, explained in detail in Scarfi 1990 (with analytical data on each metallurgical step).

The icon of the ‘Winged Lion’ had developed from the apocalyptic tetramorphs (lion, ox, eagle and winged man) and the lion protomes, winged and nimbate (surrounded by a halo or circle of light), commonly depicted in wall mosaics between the fifth and thirteenth centuries AD. The meanings and uses of the Venetian Winged Lion, and its transformation between 1261 and 1268 from religious icon to state emblem, are a focus of recent scholarship (Aldrichetti 2002; Pedani 2004: 3; Griffith 2005; Rizzi 2012: vol. 1, 17–26, 33, 65).

In the thirteenth century, Mongolian heraldry adopted the Winged Lion (e.g. von Fircks 2018: 182, fig. 13) and similar lions appear in Mamluk dinars minted by sultans Baybars (1260–1277) and Baraka (1277–1280), and in coeval military insignia (Pedani 2004). A late-eleventh-century panel depicting two rampant winged lions appears in the doge’s chapel in St Mark’s Basilica (Zuliani 1969: 113–42).

The earliest representations of Winged Lions in Venice are *in moeca*—with radiating wings turned towards the head, like the legs of a crab. The oldest are three sculpted reliefs, two of which are now in the Museo Correr, that have been subject to reuse and damage since their creation, sometime between the eleventh and fourteenth centuries AD (Rizzi 2012: vol. 2, cat. 190 & 191, 32; cat. 523, 55). One of the reliefs at the Museo Correr, originally from the church of St Aponal (twelfth–thirteenth centuries), may be a ‘portrait’ of the St Mark’s Lion before its installation on top of the column (after 1172, but before 1293: Piazza 2023; Artioli et al. 2024a). The third relief, whose copy is still *in situ* in Rio de San Marcuola, is also reminiscent of the bronze Lion, with its curls and odd human-like lateral ears.

The Winged Lion came to the fore as an official symbol of Venice in the early 1260s (Rizzi 2012: vol. 1, 18). Holding a book—a symbol of identity—in its paws, it supplanted the traditional veneration of the Byzantine St Theodoros, condensing into a single image the celestial authority and the earthly power of the Republic (Rizzi 2012: vol. 1, 17–26, 33, 65; Crouzet-Pavan 2017: 107–17). A seal from 1261 depicts Doge Ranieri Zeno receiving a banner with the lion *in moeca* from St Mark (Rosada 1985). Two bronze capacity measures for wheat with winged lions cast in relief on surface, held in the Venice State Archives, date from 1262 and 1263 (Rizzi 2012: vol. 2, cat. 663, 65; vol. 1, fig. 2, 18), and a poem by Martino da Canal, written in 1274, describes the Winged Lion on the city’s banner (Tigler 2000: 20).

The adoption of this Marcian banner, from 1261 onwards, coincided with an abrupt redefinition of Venice’s state boundaries, when its primacy in the eastern Mediterranean was faltering. On 25 July 1261, the Byzantine emperor Michael VIII Palaeologus reconquered Constantinople, inflicting a deadly blow to the Latin Empire. Patriarch Pantaleone Giustinian and Venetian *podestà* (chief magistrate) Marco Gradenigo took refuge in Negroponte, where a “political lion” soon appeared (Pedani 2006: footnote 8,

187). Nicolò Querini, *bailo* (commander) in Acre had a Winged Lion seal coined in 1263–1264 (Dal Gian 1958: 22). Both Negroponte and Acre became border strongholds. Around the same time, *c.* 1262–1264, Niccolò and Maffeo Polo, the father and uncle of Marco Polo, were trading in Bukhara, before joining a diplomatic mission by *khan* Hulagu to Khanbaliq (Beijing) and the court of Kublai Khan (Wright 1948; Jackson 1998). While there, it is possible that they encountered the original bronze sculpture of the St Mark's Lion.

Stylistic considerations

The St Mark's Lion (hereafter, the 'Lion') shows little or no iconographic relationship with medieval Romanesque lions (early and middle phases, *c.* AD 1000–1150) nor with Gothic lions of the early and 'classical' phases (twelfth to mid-thirteenth centuries AD). While the style also diverges from Moorish sculptures, around AD 1377–1380 (e.g. The Court of the Lions in the Alhambra, Granada, Spain), the potential Chinese provenance of the bronzework has never been discussed in detail.

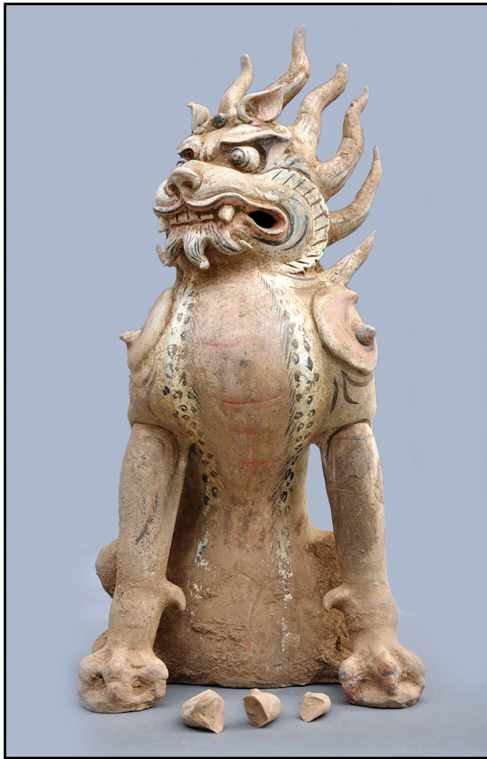


Figure 2. A Tang-dynasty painted and gilt earthenware *zhènmùshòu* (镇墓兽 'tomb guardian') excavated from Tomb M2 at Fujiagou Village in Lingtai County (Gansu, China) (image from <https://www.timeunion.com/entertainment/article/Clark-Art-Institute-explores-Uncearthed-3738598.php>).

Ancient Chinese art is replete with lions and lion-like creatures (Sirén 1925, 1930, 1960; Munsterberg 1948; Segalen 1995; Falco Howard 2006). Particular comparisons may be drawn with Tang Dynasty artefacts, including an earthenware *zhènmùshòu* (镇墓兽 'tomb guardian') from the early eighth-century AD Tomb M2 at Fujiagou Village, Lingtai County, Gansu (Figure 2), a series of tri-color-glazed ceramic *zhènmùshòu* on display in the Luoyang Museum (Henan) and a specimen probably originally from Shaanxi Province now on display at the Cleveland Museum of Art (Figure 3). Other tomb guardians have been lost to the antiquities market (Figure 4). These hybrid creatures share leonine muzzles, flaming manes, horns and raised wings attached to the shoulders, pointed upraised ears and, sometimes, partially humanised facial features.

Although rendered in different materials, the muzzles of the Tang hybrids resemble the 'Lion' in their bulbous noses, the lateral position of the ears, the swellings under the chin, the gnashing of



Figure 3. A Tang-dynasty zhènmùshòu in glazed sancai (three-colour) earthenware, probably from Shaanxi province (courtesy of the Cleveland Museum of Art, 2000.118.1).

the mouth exposing four powerful canines, and the twisted wrinkle of the forehead at the root of the disproportionately large nose. Zhènmùshòu also often display erect, pointed ears, covered with hair flocks, and the unusual human-like lateral ears of the ‘Lion’ could be the remnants of such bat-like ears. Rather than tapering, the upper edge of the auricles on the ‘Lion’ is thick, blunt and rounded, suggesting that an upper portion may have been sawn off.

Additional modifications are apparent. A ‘wig’ is added to the top of the head, which covers the scars left by the removal of one or two horns (Figure 5; Scarfi 1990: 76, fig. 66). Traces of the plumage below the attachment of the later wings just behind the shoulders indicates that the original bronze was also winged (Scarfi 1990: 54–56, fig. 27). These features recall apotropaic funerary figurines of fantastic hybrids from ancient China, such as the *píxiū* (貔貅), a winged leonine creature, usually with a horn (if male) or two (if female), protruding eyes and sharp fangs, or the *bìxié* (辟邪),

a hornless winged leonine hybrid (Till 1980).

The streaming waves that compose the mane of the ‘Lion’ do, however, lack parallels in ancient Chinese art. After the second century AD, Chinese leonine sculptures, hybridised and winged, had either a solid mane without tufts or, since the sixth–seventh centuries AD, manes of dense curls. Examples of these may be found in the sitting lions of the sacred, monumental ‘Spirit Road’ (神道 *shéndào*) leading to the tombs of the aristocracy, or in the low-relief sculptures in Buddhist rock temples and cast copper alloys devotional or votive artefacts (Sirén 1925; Paludan 1991).

Large, pre-Ming (before 1368) bronze statues have not survived. Between the fifth and the twelfth centuries AD, Mahayana Buddhism enjoyed the favour of the imperial house. Wealthy monasteries under imperial protection commissioned large devotional, talismanic statues, such as the ‘Buddhist lion’ (佛狮子 *Fú shīzi*) (also popularly called ‘Dog of Buddha’ or ‘Fu Dog’), to guard the entrances to Buddhist temples and monasteries. Yet, between AD 574 and 577 Emperor Wu (r. 543–578, Northern Zhou dynasty) confiscated Taoist and Buddhist estates, and bronze statues were smashed and remelted. In 845, Tang Emperor Wuzong (r. 840–846) enacted the ‘Persecution of Buddhism in the Huichang Era’; 4600 temples and monasteries were destroyed, their



Figure 4. A Tang-dynasty white terracotta zhèn mù shòu that shows similarities, particularly in the details of the muzzle, to the 'Lion' (after Artioli et al. 2024: fig. 8.7; zhèn mù shòu images from <https://www.tjitra.nl/T9210-qp-97/view>). The sculpture is 620mm high.

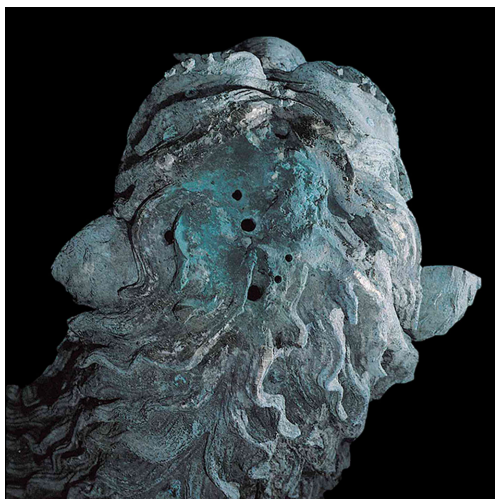


Figure 5. View of the top of the head of St Mark's 'Lion' once the 'wig' was removed. Note the linear-angular contour of the ears and the signs that something—probably horns—has been cut off. The abrupt end of the fur floes suggest that ears were also sawn off (Scarfi 1990: 76, fig. 66).

properties confiscated, and all bronze statues reused for minting coins. In a third state persecution by Emperor Shizong (r. 954–959, later Zhou dynasty), 3336 temples and monasteries were erased, and all statues weighing more than 2.5kg were melted down, again for coins (Ch'en 1954; Reischauer 1955; Palumbo 2017). As a result, almost no evidence of large bronze Buddhist statues from the seventh to the tenth centuries remains.

From the tenth century AD onwards (Song, Liao, Jin and Yuan dynasties), Buddhist sculptors worked with wood, stucco or stone. When the Mongols conquered China in 1206 and the Yuan Dynasty was founded (1271–1272), Tibetan Vajrayana Buddhism became a de facto state religion. It embedded prominent symbols of Tibetan Buddhism, among them the celestial

wingless 'snow lion' guardian (Tibetan 雪獅 *xuěshī*, *gangs seng ge*). Examples of this later style can be seen in the sculpture of a lion with cubs found in the infill of the Beijing city walls (rebuilt from 1402), now at the Beijing Stone Carving Art Museum, and in the lions of the 'Black Ditch Bridge' (卢沟桥 *Lúgōu Qiáo*), also known as the 'Marco Polo Bridge', constructed in the late twelfth century (Ciarla, in press). The bulbous manes of these lions again differ from the waves portrayed on the St Mark's Lion.

Casting process and isotopic evidence

Although suggestive, stylistic comparisons remain subjective. Examination of the construction and chemical composition of the 'Lion' provides a more objective assessment of its provenance. Such assessment builds on previous compositional and stylistic mapping of the different phases of casting and subsequent modification/restoration (Figure 6; Scarfi 1990), and is made possible through the availability of three samples of the original parts, the development of lead isotope analysis protocols for metal provenancing (Gale & Stos-Gale 1982; Albarède *et al.* 2012; Pernicka 2014; Baron *et al.* 2014; Villa 2016; Artioli *et al.* 2020), and the recent publication of extensive reference databases of lead isotope data for ores and deposits (Killick *et al.* 2020; Tomczyk 2022).

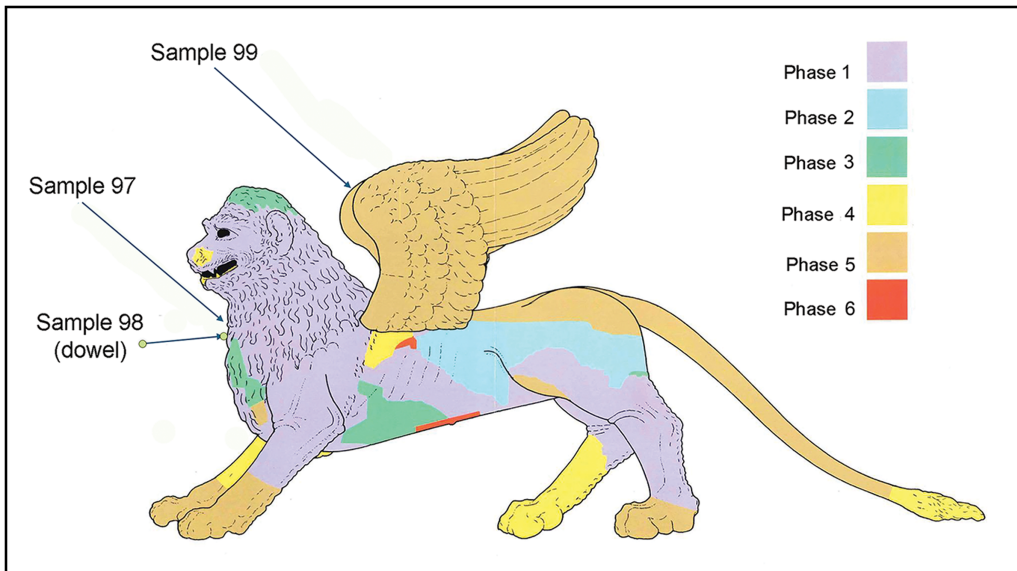


Figure 6. Six different phases of casting and casting-on identified by Scarfi (1990: tab. XV). Phase 1 (from which two of our samples came) and Phase 2 are ascribed to the original Tang sculpture (figure by authors modified from Scarfi 1990).

Bronze casting

The traditional Chinese bronze casting technique—epitomised by the Shang-Zhou ritual vases of the fifteenth–fourth centuries BC—was piece- (or section) mould casting (Barnard 1961; Gettens 1969; Tan & Lian 2011), enhanced since the fifth–fourth centuries BC by the direct and indirect lost-wax casting techniques (Peng 2020, 2023). Traditional piece-mould casting was still used in the fifth century AD to cast Buddhist icons, such as the gilt-bronze Standing Buddha Maitreya displayed in the Metropolitan Museum in Washington D.C. (n. 26.123), dated AD 486 (Strahan 2010: 58). The outer surface of the 'Lion' does not exhibit any joints suggestive of piece-moulding, but copper core pins and spacers left by lost-wax castings on clay cores are visible both on the earliest-cast parts (Phase 1) and on those from the remodelling phases. Phase 1 core pins have a smaller diameter than those from the later phases, but, as the 'Lion' remains atop its column, it is not possible at present to quantify or evaluate the difference. The casting sequence is unusually complex (Figure 6; Scarfi 1990), perhaps reflecting the difficult fit of the top of a *zhènmùshòu*-like seated form onto a horizontal leonine body. If this is the case, a reconsideration of the casting sequence is needed.

Lead isotope analysis

Characterisation of the chemical composition of metal artefacts, particularly the isotopic signature of lead traces, provides a reliable means of linking metals to their original ore deposits (Gale & Stos-Gale 1982; Pernicka 2014). Three samples of metal alloy from

Table 1. Lead isotope analysis data from the St Mark's 'Lion'.

Sample number	Part (Phase)	Phase	$^{206}\text{Pb}/^{204}\text{Pb}$	$^{207}\text{Pb}/^{204}\text{Pb}$	$^{208}\text{Pb}/^{204}\text{Pb}$	$^{208}\text{Pb}/^{206}\text{Pb}$	$^{207}\text{Pb}/^{206}\text{Pb}$	Reference
12	Right thigh	2	18.460	15.603	38.4337	2.082	0.8452	Sentimenti <i>et al.</i> 1990
12	Right thigh	2	18.484	15.630	38.5022	2.083	0.8456	Sentimenti <i>et al.</i> 1990
15	Right ribs	3	18.360	15.608	38.3908	2.091	0.8501	Sentimenti <i>et al.</i> 1990
15	Right ribs	3	18.361	15.607	38.3378	2.088	0.8501	Sentimenti <i>et al.</i> 1990
18	Left back paw	1	18.430	15.630	38.4818	2.088	0.8481	Sentimenti <i>et al.</i> 1990
18	Left back paw	1	18.461	15.660	38.5096	2.086	0.8483	Sentimenti <i>et al.</i> 1990
97	Neck, mane	1	18.5021	15.6639	38.6291	2.0878	0.8465	This study
98	Repair dowel	1	18.3934	15.6454	38.4858	2.0923	0.8505	This study
99	Right wing	5	18.3999	15.6487	38.4968	2.0922	0.8504	This study

the 'Lion' (Figure 6) were examined using inductively-coupled plasma multi-collector mass spectrometry (ICP-MC-MS) and compared with samples tested previously but never fully interpreted (Sentimenti *et al.* 1990). Sample treatment and the generation of results followed established protocols (Artioli *et al.* 2017, 2024b). The three new samples were taken from the frontal part of the curly mane (sample 97, casting phase 1), a frontal repair dowel (sample 98, casting phase 1) and the right wing (sample 99, casting phase 5). These are added to the three samples previously analysed in duplicate from phases 1, 2 and 3 (samples 12, 15 & 18; Sentimenti *et al.* 1990) to provide a total of nine lead isotope measurements now available for the 'Lion' (Table 1).

The lead isotope ratios of the three new samples are consistent with the results of previous analyses (Table 1; Sentimenti *et al.* 1990: 183, tab. 11). When compared with reference databases for Eurasian ores, including all available data for identified deposits from Iberia to Anatolia, the Caucasus, Iran and China (Iberlid: www.ehu.eus/ibercron/iberlid; OXALID: oxalid.arch.ox.ac.uk; Leuven repository: <https://doi.org/10.48804/D4DPLJ>; Hsu & Sabatini 2019; Tomczyk 2022), the lead isotope ratios from the 'Lion' are compatible with a limited range of copper (Cu) ore deposits. Plotting against the worldwide database (Killick *et al.* 2020) indicates a broad fit with ore deposits related to the Alpine/Tethyan orogenic event that formed Pb-Zn-Cu deposits from North Africa to China (Figure S1). A closer comparison with the available Eurasian deposits (Figure 7), indicates a partial fit with some copper deposits in the Balkans, particularly Bulgaria, though stylistic and historical considerations rule these out as possible origins. A much weaker fit includes peripheral portions of the data clouds of the Swiss, German and Anatolian (Pontic Area) deposits. Available data on other Western Asian deposits (Armenian, Iranian and Omani ones) are also plotted for comparison in Figure 7, but

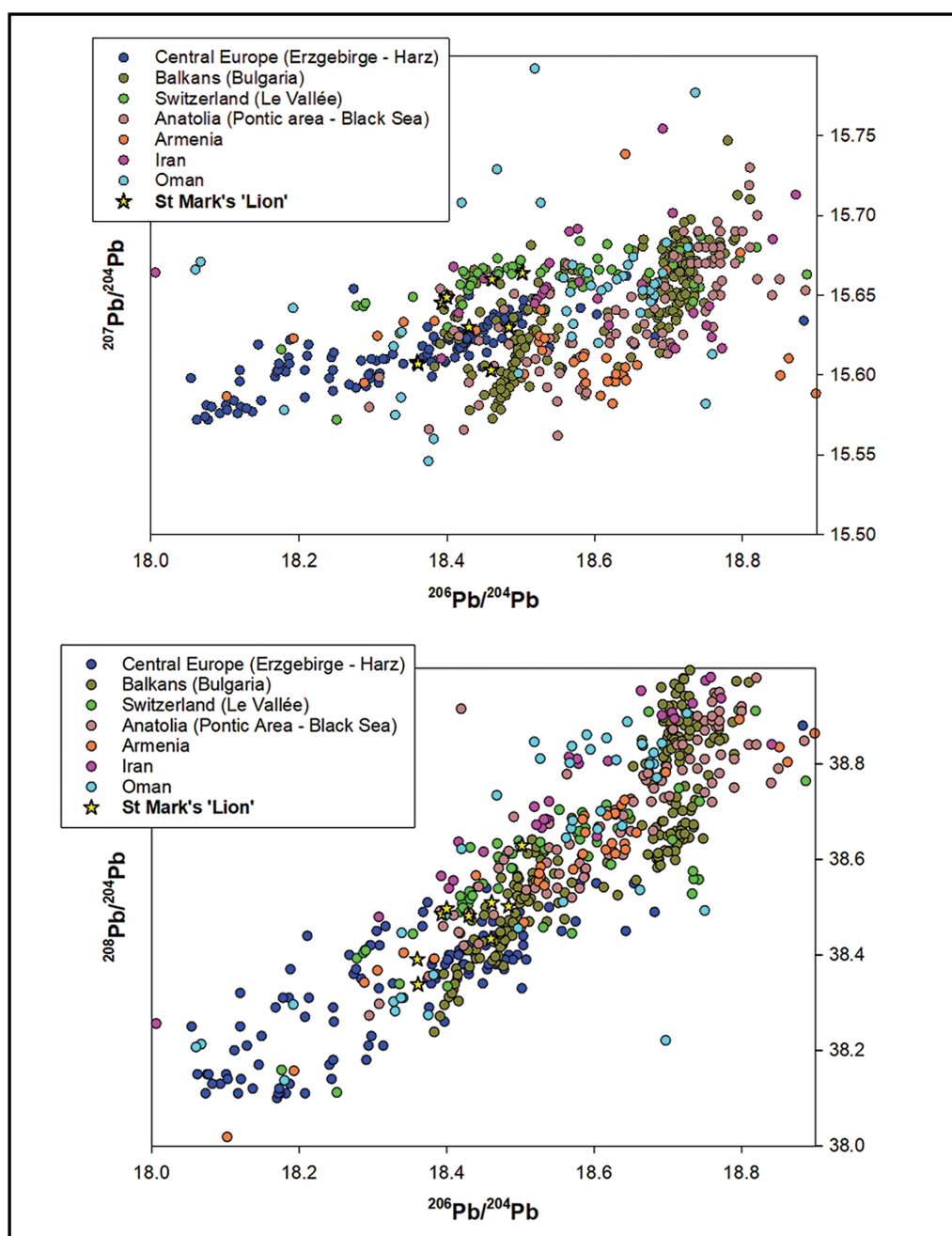


Figure 7. Bi-dimensional plots of lead isotope analysis data for the St Mark's 'Lion' samples (yellow stars) compared with the best-fitting values from Eurasian lead deposits (figure by authors).

can be excluded as possible origins due to differences in data trends, especially on the geologically significant $^{208}\text{Pb}/^{204}\text{Pb}$ versus $^{206}\text{Pb}/^{204}\text{Pb}$ plot.

Extending the search to a database of Chinese ores (Hsu & Sabatini 2019), copper and polymetallic mines along the Lower Yangzi River show a good fit with the lead isotope ratios of the ‘Lion’ (Figure 8). Some of the Upper Yangzi (Yunnan province) deposits also show a partial overlap with the Lower Yangzi deposits in the $^{207}\text{Pb}/^{204}\text{Pb}$ versus $^{206}\text{Pb}/^{204}\text{Pb}$ diagram, though the $^{208}\text{Pb}/^{204}\text{Pb}$ versus $^{206}\text{Pb}/^{204}\text{Pb}$ plot indicates a clear geological discrimination between the two tectonic units. The lead isotope ratios from the ‘Lion’ are particularly compatible with the ores of the Guishan and Yaojialing deposits in Anhui province and the Anji deposits in Zhejiang province—all within the Lower Yangzi tectonic unit (Hsu & Sabatini 2019; a summary table of the statistically most affine deposits and their geographical location appears in Figure S2).

Chemical composition

Metal samples 97, 98 and 99 were also embedded in resin and semi-quantitatively analysed by scanning electron microscopy using energy dispersive x-rays (SEM-EDS) to determine their major elements content (i.e. elements > 1wt%) (Table 2). These results were also compared with previous analyses (Sentimenti *et al.* 1990). Sample 97, from the mane, is a tin (Sn) bronze (Sn 15.7wt%) with a measurable amount of lead (Pb) (Figure 9a), similar to the mean composition of previous samples from phase 1 (Sentimenti *et al.* 1990: 163, tab. 2). Sample 99, from the right wing, has about half the Sn content of sample 97, but shows higher Pb and 2.5wt% of zinc (Zn) (Figure 9b). This composition is comparable to previous samples from phase 5 (Sentimenti *et al.* 1990: 163, tab. 2), which were quite variable in Sn, Zn and Pb content, and is consistent with the known addition of Zn or brass during the recasting of the wings in 1815. Sample 98, however, does not fit well with the compositional class from phase 1, to which it is presumed to belong, due to its low Sn, high Pb and trace amounts of Zn. This composition may result from a mixing of the original metal with that of phase 5, but the complex composition does not identify a clear boundary between the parts that were made and recast at different times.

Discussion

In alloys containing very small amounts of lead (i.e. casting phase 1 in Scarfi 1990), the lead isotope signal reflects the source of copper, as the lead is an incidental addition from the original copper ore. When the lead quantity is appreciable (about a few wt% or higher, such as in the analysed samples, Table 2), the lead isotope signal most likely reflects the origin of the lead added to lower the melting point of the alloy for brazing and amending casting defects (i.e. phases 2–3).

The apparent paradox of the relative homogeneity of lead isotope ratios in different reconstruction and restoration steps can be reconciled if phases 1, 2 and 3 were actually related to the adjustment and amendment of casting defects carried out shortly after casting, well before the statue appeared in Venice (Scarfi 1990: 55–64). Restoration of

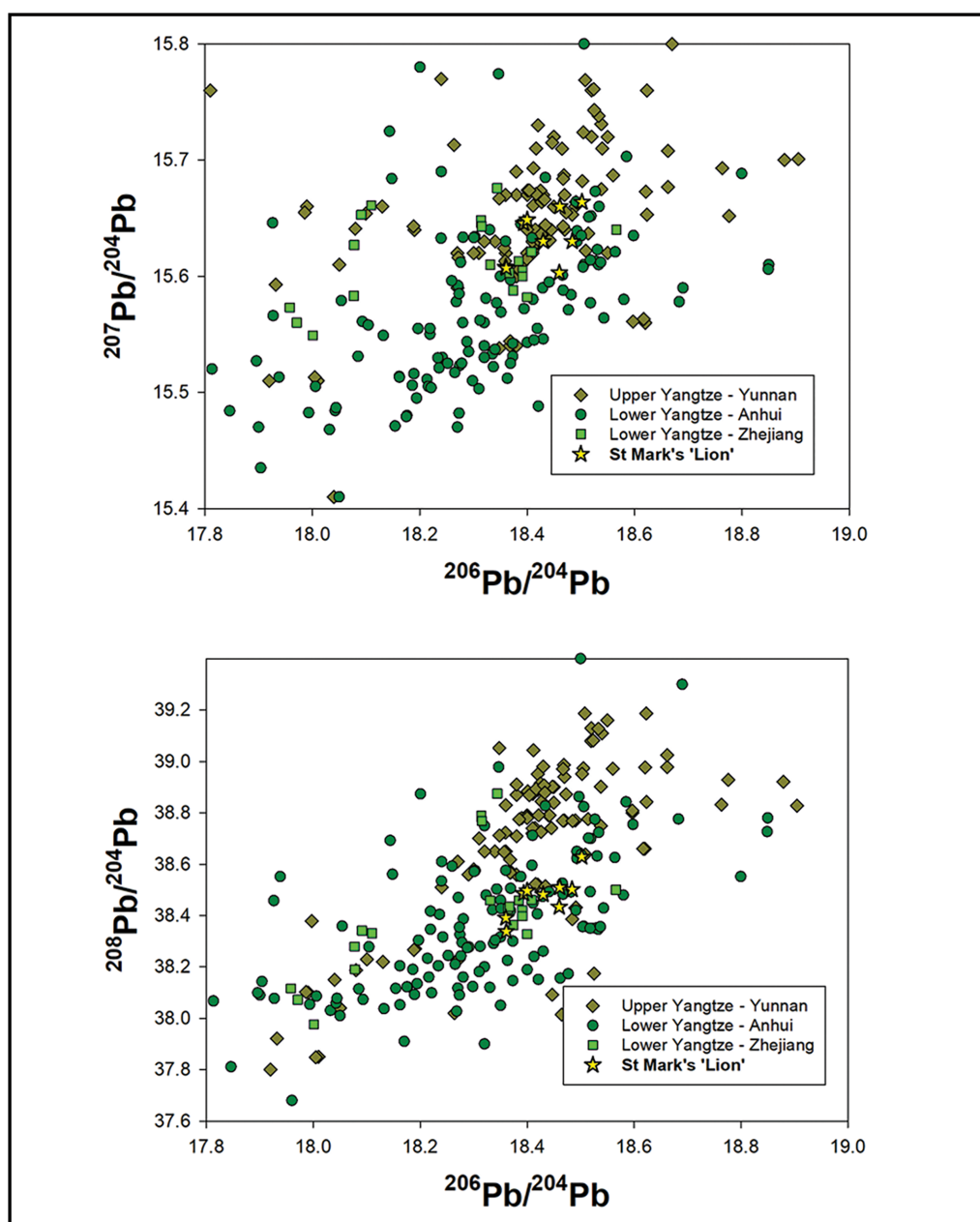


Figure 8. Bi-dimensional plots of lead isotope analysis data for the St Mark's 'Lion' samples (yellow stars) compared with the best-fitting values from Chinese lead deposits (figure by authors).

the 'Lion' was undertaken in 1815 by Bartolomeo Ferrari after the broken parts were returned from France (phase 5; Scarfi 1990: 49–50). The replaced parts, including the wings (sample 99), were obtained by remelting fragments of the original pieces with added brass, detectable by the high Zn content. Yet the lead signal of sample 99 is

Table 2. Chemical composition of the samples measured by SEM-EDS analyses (oxygen, iron, nickel, copper, zinc, tin and lead) expressed as the mean and standard deviation (SD) of three or four areas. Inclusions and segregations identified in the samples are listed in the last column.

Label	Sample position	Phase	Element wt%							Inclusions and segregations	
				O	Fe	Ni	Cu	Zn	Sn		Pb
Sample 97	Frontal part of the mane	1	Mean	1.7		0.8	80.0		15.7	1.8	δ Phase rich in Ni (1.26wt%); Pb segregations; rare Cu-Fe-Zn sulphides.
			SD	0.4		0.1	0.1		0.6	0.3	
Sample 98	Repair dowel	1	Mean		0.1		87.7	0.6	6.7	4.8	Numerous Pb segregations, Cu sulphides with Fe and Zn chemical zoning, soft residual coring.
			SD		0.2		0.3	0.2	0.2	0.4	
Sample 99	Right wing	5	Mean		0.4		87.2	2.5	7.0	2.9	δ Phase segregations, Cu-Fe-Zn sulphides, evident coring Pb segregations.
			SD		0.3		0.9	0.0	0.3	0.7	

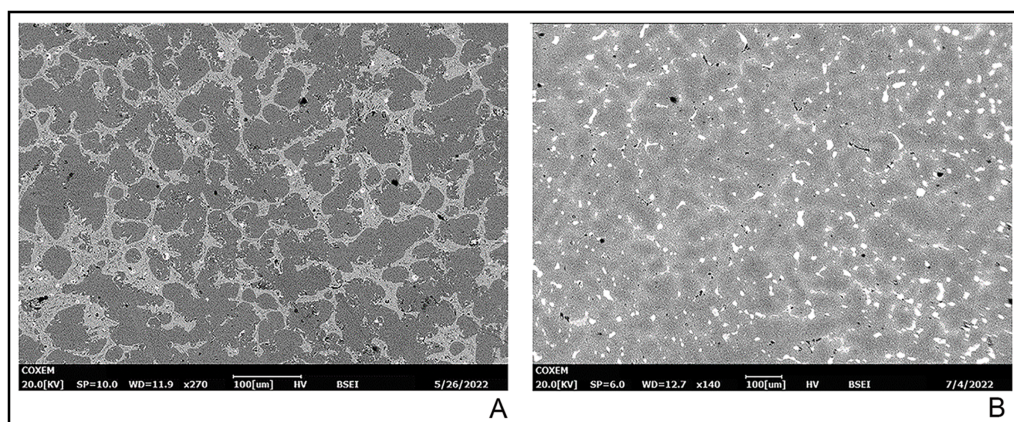


Figure 9. A) Backscattered electron image of sample 97 from the mane; the high content of the delta phase (pale grey) and the small, rare segregations of lead (white) are visible; B) backscattered electron image of sample 99 from the wing; the white areas testify to the high lead content (figure by authors).

comparable with that of the other samples and thus still reflects the original formulation. This is possible only if pure Zn or brass with a very low lead content was added.

All analysed samples therefore show a remarkable homogeneity in the lead isotope composition, despite the complex casting and remaking history of the 'Lion'. In turn, all samples are compatible with a source in the ores outcrops along the Lower Yangzi River, among the most important deposits of mainland China. Comparison with available data

from Chinese artefacts reveals that a bronze fragment from the late Shang period found in Tomb-493 at the Yinxu Stadium cemetery (sample AY-3; Li *et al.* 2024) has the same lead isotope signal as the 'Lion' (see Figure S3). Although an isolated find, this suggests that the Lower Yangzi deposits were known and exploited at least from Shang times (c. 1600–1050 BC).

In general, information on contact between Europe and China in the medieval period is scarce. While a celadon jar in St Mark's Treasury is a Qingbai porcelain, made in south-eastern China during the Song or Yuan dynasties and coeval with the travels of the Polo family (Meicun & Zhang 2018), a systematic study of Chinese medieval ware imported to Venice has not, so far, been attempted. The violet granite of the column on which the 'Lion' stands was possibly brought to Venice with horses and loot from the sack of Constantinople (Venturi 1902; Tigler 2000: 17, 20–22), but this is an unlikely origin for the still mysterious history of the 'Lion' itself. If it had been a victim of one of the above-mentioned systematic destructions, it might have belonged in a hoard of sculptural pieces that had escaped melting and reuse for half a century. In turn, that would suggest an early medieval or late antique trade connection between Constantinople and eastern China, but there is little historical or material evidence for that.

Another possibility is that Niccolò and Maffeo Polo, in AD 1264–1268 (when the 'political' Winged Lion was actively established), encountered—perhaps in a foundry or imperial storeroom at Khanbaliq—a dismantled Tang bronze funerary sculpture, whose impressive head could be taken as leonine. In the general effort to spread the Republic's new powerful symbol, the Polos may have had the somewhat brazen idea of readapting the sculpture into a plausible (when viewed from afar) Winged Lion. Although we cannot exclude that the statue was modified by Chinese hands, changes were more likely performed while transforming a hybrid monster into the desired leonine image. Whether and to what extent the Pope and coeval 'Vatican diplomacy' were informed by the Venetian emissaries of such a visionary and hazardous project, remains unknown. The two Polos, belonging to a diplomatic web linking the Mongol court, the Pope and other powers, may have sent home large pieces of the hybrid statue, which were then discreetly and laboriously refitted into the reborn holy emblem of St Mark. Was this the birth of the big 'Lion' that Marco, Niccolò and Maffeo eventually saw in place, when disembarking at Venice in 1295? Of course, this is only one possible scenario based on the intersection of historical and archaeometallurgical data. The word now goes back to the historians.

Conclusion

Against traditional narratives that hypothesised local, Anatolian or Syrian production, we argue that the muzzle and mane of the hybrid bronze creature have similarities with Tang Dynasty *zhènmùshòu* (even though comparisons with earlier and later Chinese sculptures, in principle, could not be excluded). It is possible that Marco Polo's father and uncle, during the four years they spent at the court of Kublai Khan during their first journey, were responsible for the acquisition of the sculpture. Lead isotope analysis

of the bronze supports a Chinese origin, identifying likely copper sources in the Lower Yangzi River region. In a puzzling absence of written information, the intention and logistics behind its journey to Venice remain elusive and open to interpretation. If the installation of the ‘Lion’ was meant to send a strong, defensive political message, we can now also read it as a symbol of the impressive connectedness of the medieval world.

Acknowledgements

Many thanks to the anonymous referees for their help improving the article. The authors are deeply indebted to Gisella Capponi, formerly the Director of the Istituto Superiore per la Conservazione ed il Restauro, Rome, and the late Maurizio Marabelli, an unforgettable friend, for their kind permission to analyse the three samples of the bronze ‘Lion’. Thanks also to Eugenio Burgio for his constant collaboration.

Funding statement

This study was funded by support from the University of Padova.

Online supplementary material (OSM)

To view supplementary material for this article, please visit <https://doi.org/10.15184/aqy.2025.10159> and select the supplementary materials tab.

References

- ALBARÈDE, F., A.-M. DESAULTY & J. Blichert-TOFT. 2012. A geological perspective on the use of Pb isotopes in archaeometry. *Archaeometry* 54: 853–67. <https://doi.org/10.1111/j.1475-4754.2011.00653.x>
- ALDRIGHETTI, G. 2002. *L'araldica e il leone di San Marco*. Venezia: Marsilio.
- ARTIOLI, G., I. ANGELINI, G. KAUFMANN, C. CANOVARO, G. DAL SASSO & I.M. VILLA. 2017. Long-distance connections in the Copper Age: new evidence from the Alpine Iceman's copper axe. *PLoS ONE* 12. <https://doi.org/10.1371/journal.pone.0179263>
- ARTIOLI, G., C. CANOVARO, P. NIMIS & I. ANGELINI. 2020. LIA of prehistoric metals in the Central Mediterranean area: a review. *Archaeometry* 62: 53–85. <https://doi.org/10.1111/arc.12542>
- ARTIOLI, G., I. ANGELINI & M. VIDALE. 2024a. A ‘Lion’ on the Silk Road, in J. Henderson, S. Morgan & M. Salonia (ed.) *Reimagining the Silk Roads: interactions and perceptions across Eurasia*: 110–28. London: Routledge. <https://doi.org/10.4324/9781003348702-10>
- ARTIOLI, G., I. ANGELINI, C. CANOVARO, G. KAUFMANN & I.M. VILLA. 2024b. Lead isotopes of prehistoric copper tools define metallurgical phases in Late Neolithic and Eneolithic Italy. *Scientific Reports* 14. <https://doi.org/10.1038/s41598-024-54825-z>
- BARNARD, N. 1961. *Bronze casting and bronze alloys in ancient China*. Canberra: Australian National University.
- BARON, S., C.-G. TÁMAŞ & C. LE CARLIER. 2014. How mineralogy and geochemistry can improve the significance of Pb isotopes in metal provenance studies. *Archaeometry* 56: 665–80. <https://doi.org/10.1111/arc.12037>
- BOLOGNARI, M. & S. SIMION. 2024. Una famiglia veneziana di mercanti tra Due e Trecento: i Polo e Marco, in S. Simion & E. Burgio (ed.) *Marco Polo. Storia e mito di un viaggio e di un libro*: 65–92. Roma: Carocci.
- CATRA, E. 2014. Il Veneto Leone marciano alato di piazzetta San Marco restaurato. Documenti inediti circa l'opera di Bartolomeo Ferrari (1815–1816). *Arte Documento* 30: 74–79.

- CESSI, R. (ed.) 1931. *Deliberazioni del Maggior Consiglio di Venezia, volume 3*. Bologna: Regia Accademia dei Lincei.
- CH'EN, K. 1954. On some factors responsible for the antibuddhist persecution under the Pei-Ch'ao. *Harvard Journal of Asiatic Studies* 17: 261–73. <https://doi.org/10.2307/2718134>
- CIARLA, R. In press. 'Leone ruggente', in F. Rispoli & R. Ciarla (ed.) *Visioni d'Oriente – arti asiatiche nella Collezione della Banca d'Italia*: 128–35. Roma: Banca d'Italia.
- CROUZET-PAVAN, E. 2017. Pouvoir et politique des reliques dans la Venise médiévale. *Ekklesia. Approches croisées d'histoire politique et religieuse* 104: 107–17. <https://doi.org/10.4000/pallas.7372>
- DAL GIAN, M.L. 1958. Il leone di San Marco sulle monete e sulle oselle della Serenissima. Venezia: Edizioni della fortuna.
- ELAM, C. 1990. Editorial. St Mark's Lion brought down to Earth. *The Burlington Magazine* 132: 827.
- FALCO HOWARD, A. 2006. *Chinese sculpture*. New Haven (CT): Yale University Press.
- GALE, N.H. & Z.A. STOS-GALE. 1982. Bronze Age copper sources in the Mediterranean: a new approach. *Science* 216: 11–19. <https://doi.org/10.1126/science.216.4541.11>
- GETTENS, R.J. 1969. *The Freer Chinese bronzes, volume 2: technical studies* (Freer Gallery of Art Oriental Studies 7). Washington, D.C.: Smithsonian Institution.
- GRIFFITH, E. 2005. *The winged lion of St. Mark: logo of Venice, Inc.* Paper delivered to the European Business History Association, Frankfurt, 1–4 September 2005. Available at: <https://ebha.org/ebha2005/pdf%20papers/Griffith%20FINAL.pdf> (accessed 1 August 2024).
- HSU, Y.-K. & B.J. SABATINI. 2019. A geochemical characterization of lead ores in China: an isotope database for provenancing archaeological materials. *PLoS ONE* 14. <https://doi.org/10.1371/journal.pone.0215973>
- JACKSON, P. 1998. Marco Polo and his 'travels'. *Bulletin of the School of Oriental and African Studies* 61: 82–101.
- KILICK, D.J., J.A. STEPHENS & T.R. FENN. 2020. Geological constraints on the use of lead isotopes for provenance in archaeometallurgy. *Archaeometry* 62: 86–105. <https://doi.org/10.1111/arc.m.12573>
- LAZZARINI, L. 2010. Six coloured types of stone from Asia Minor used by the Romans, and their specific deterioration problems. *Studies in Conservation* 55: 140–46. <https://doi.org/10.1179/sic.2010.55.Supplement-2.140>
- LI, Q., G. WEI, H. HAYAN, J. TANG & B. ZHANG. 2024. Lead isotope ratio analysis of lead ingots and bronze wares unearthed from Yinxu. *Archaeometry* 66: 368–79. <https://doi.org/10.1111/arc.m.12915>
- MEICUN, L. & R. ZHANG. 2018. A Chinese porcelain jar associated with Marco Polo: a discussion from an archaeological perspective. *European Journal of Archaeology* 21: 39–56. <https://doi.org/10.1017/ea.2017.21>
- MUNSTERBERG, H. 1948. Chinese buddhist bronzes of the T'ang-period. *Artibus Asiae* 1: 27–45.
- PALUDAN, A. 1991. *The Chinese Spirit Road: the classical tradition of stone tomb statuary*. New Haven (CT): Yale University Press.
- PALUMBO, A. 2017. Exemption not granted: the confrontation between Buddhism and the Chinese State in late antiquity and the 'first great divergence' between China and western Eurasia. *Medieval Worlds* 6: 118–55. https://doi.org/10.1553/medievalworlds_no6_2017s118
- PEDANI, M.P. 2004. Mamluk Lions and Venetian Lions. 1260–1261. *Electronic Journal of Oriental Studies* 7/21: 1–18.
- 2006. Il leone di san Marco o san Marco in forma di leone? *Archivio Veneto, Serie V*, vol. CLXVI (2006): 185–90.
- PENG, P. 2020. *Metalworking in Bronze Age China – the lost-wax process*. Amherst (NY): Cambria Press.
- 2023. Between piece molds and lost wax: the casting of a diatrete ornamentation in early China rethought. *Humanities and Social Sciences Communications* 10. <https://doi.org/10.1057/s41599-023-01984-5>
- PERNICKA, E. 2014. Provenance determination of archaeological metal objects, in B.W. Roberts & C.P. Thornton (ed.) *Archaeometallurgy in global perspective: methods and syntheses*: 239–68. New York: Springer. https://doi.org/10.1007/978-1-4614-9017-3_11
- PIAZZA, S. 2023. Alle origini dell'emblema di Venezia. Il Leone 'in moeca' di S. Aponal, in A. Pala & N. Usai (ed.) *Doctrina et investigatio*.

- Studi di storia dell'arte medievale in memoria di Roberto Coroneo*: 137–50. Roma: Viella.
- PILUTTI NAMER, M. 2013. Ruskin e gli Allievi. Note su Giacomo Boni e la cultura della conservazione dei monumenti a Venezia a Fine Ottocento. *Ateneo Veneto CC terza serie* 12(1): 423–35.
- REISCHAUER, E.O. 1955. *Ennin's travels in Tang China*. New York: Ronald.
- RIZZI, A. 2012. *I leoni di San Marco. Il simbolo della Repubblica veneta nella scultura e nella pittura, volumi 1–3*. Verona: Arsenale.
- ROSADA, M. 1985. “Sigillum Sancti Marci”. *Bolles e sigilli di Venezia*. In S. Ricci (ed.) *Il sigillo nella storia e nella cultura*: 109–148. Roma: Jouvence.
- SCARFI, B.M. (ed.) 1990. *The Lion of Venice: studies and research on the bronze statue in the Piazzetta*. Venezia: Albrizzi.
- SEGALEN, V. 1995. *Chine. La grande statuaire - figures*. Paris: Robert Laffont.
- SENTIMENTI, E., R. GUERRIERO & P.R. TRINCHERINI. 1990. Studi chimico-fisici e microstrutturali, in B.M. Scarfi (ed.) *The Lion of Venice: studies and research on the bronze statue in the Piazzetta*. Venezia: Albrizzi.
- SIRÉN, O. 1925. *Chinese sculpture from the fifth to the fourteenth centuries, volumes 1–4*. London: Ernest Benn.
- 1930. *Histoire des arts anciens de la Chine. Volume 4: sculpture*. Paris: G. van Oest.
- 1960. A reconstruction of a great collection of Chinese sculptures. *East & West* 9(2–3): 75–93.
- STRAHAN, D. 2010. Buddha Maitreya, creating sacred images of the Buddha – a technical perspective, in D. Patry & D. Strahan (ed.) *Wisdom embodied: Chinese Buddhist and Daoist sculpture in the Metropolitan Museum of Art*: 27–44. New York: The Metropolitan Museum of Art.
- TAN, D. & H. LIAN. 2011. The ancient Chinese casting techniques. *China Foundry* 8(1): 127–36.
- TIGLER, G. 2000. Intorno alle Colonne di Piazza San Marco. *Atti dell'Istituto Veneto di Scienze, Lettere ed Arti* 158: 1–46.
- TILL, B. 1980. Some observations on stone winged chimeras at ancient Chinese tomb sites. *Artibus Asiae* 42(4): 261–81. <https://doi.org/10.2307/3250032>
- TOMCZYK, C. 2022. A database of lead isotopic signatures of copper and lead ores for Europe and the Near East. *Journal of Archaeological Science* 146, 105657. <https://doi.org/10.1016/j.jas.2022.105657>
- VENTURI, A. 1902. *Storia dell'Arte Italiana, volume 2: dall'arte barbarica alla romanica*. Milano: Ulrico Hoepli.
- VILLA, I.M. 2016. Provenancing bronze: exclusion, inclusion, uniqueness, and Occam's razor, in G. Grupe & G.C. McGlynn (ed.) *Isotopic landscapes in bioarchaeology*: 141–54. Berlin: Springer. https://doi.org/10.1007/978-3-662-48339-8_8
- VON FIRCKS, J. 2018. Dou royaume des Tartares vient drap dor et de soie. *Histoire de l'Art* 82: 169–86.
- WARD PERKINS, J.B. 1947. The bronze lion of St. Mark at Venice. *Antiquity* 21: 23–41. <https://doi.org/10.1017/S0003598X00016446>
- WILLS, G. 1999. The lions of Venice. *The American Scholar* 68(2): 45–49.
- WRIGHT, T. (ed.) 1948. *The travels of Marco Polo, the Venetian*. New York: Programmed Classics.
- ZULIANI, F. 1969. *I marmi di San Marco: uno studio ed un catalogo della scultura ornamentale marciana fino all' 11° secolo*. Milano: Centro Di.