



FIG. 1. — Geographical location of the medieval site of Qasr al-Amra, in eastern Jordan, and of the other Near Eastern archaeological sites mentioned in the text.

INTRODUCTION

Located in the eastern Hashemite Kingdom of Jordan, at the southern edge of the basalt desert (also called the “black desert”), Qasr al-Amra (“the red castle”, in Arabic) was built – probably between 711 and 715 – for the Umayyad caliph Al-Walid I (Mountfort 1965; Almagro *et al.* 1975; Almagro Gorbea 1981) (Fig. 1). It is regarded as one of the most important examples of early Islamic architecture. The building is the remains of a larger complex that included an actual castle, of which only the foundations have survived. The part of the palace still standing today is a small rural property, used as a royal retreat, and without any military function (Fig. 2). The complex is composed of a central reception hall flanked by two small chambers on the south opposite the entrance, and connected to the bath rooms on the east side (Piccirillo *et al.* 1993). Syrian artists – who may even have been Christians – of the early eighth century decorated the interiors of the building with wall paintings and mosaics that, according to Brown (1971), are the last pure and untroubled efflorescence of Hellenistic grace. The decoration that survives inside portrays scenes of bathing and listening to music with naked women, an accurate representation of the zodiac, and game hunting. Unfortunately, it has suffered much from smoke, dirt, time and people scrawling and scratching their names all over the place, but is none the less in quite good condition in many parts (Lankaster Harding 1959). Despite this, the greatest importance of the Qasr al-Amra lies fundamentally



FIG. 2. — The extant archaeological site of Qasr al-Amra is what remains of a larger complex that included an actual castle, of which only the foundations have survived. The part of the palace still standing today is a small rural property, used as royal retreat, and without any military function (photo by Marco Masseti).



FIG. 3. — Detail of the onager hunt on the western wall of the great hall (photo by Fabio Vianello).

in the survival of this wall decoration which provides us with several details of the greatest interest, telling a great deal about the appearance of this small but attractive Umayyad building, as well as its use and function (Almagro *et al.* 1975). Here we have what is undoubtedly the most complete and best preserved cycle of early Islamic paintings that has come down to us. Most scholars agree that it follows a style of representation which originated in the Roman Hellenistic artistic productions found over a wide region, in accordance with the thesis of J. Balty (1986) about the permanence of classical art in the Near East (Marrison 1978; Bowersock 1992; Blázquez 1996).

The aim of the present work is to analyse the zoomorphic component of the Qasr al-Amra wall decoration, focusing on the various zoological species that can be recognised. Within precisely this overarching concept, there are essentially two architectural spaces of interest for our study: the great hall, and the adjacent *tepidarium*, the latter being a room of moderately warm temperature in ancient Roman baths.



FIG. 4. — This male of hemippe or Syrian wild ass, *Equus hemionus hemippus* Geoffroy Saint-Hilaire, 1855, was photographed by Frederick York in London zoo c. 1872 (from Edwards 1996).

THE GREAT HALL

The central bay of the great hall must have formed a decorative and thematic whole with the throne room leading from it. Immediately beyond the entrance of the great hall, introductory scenes can be seen on the side spandrels. The central vault has coffers decorated with symbolic and courtly scenes. The decoration of the vault starts in the spandrels at the front of the hall, continuing into the throne room. The walls of the latter are adorned with human figures which are assumed to be portraits of the Byzantine, Iranian and Chinese emperors and the kings of Spain and Ethiopia (Ali 1999). These are the monarchs who were defeated by the Arabs. This is another reason why, according to Almagro *et al.* (1975), the building of Qasr al-Amra can be dated after 711, when Roderick, the last Visigoth king of Spain, was defeated at the battle of Guadalete.

The dominant zoomorphic element in the decoration of the great hall is a magnificent scene in which wild equids are being hunted being corralled in nests (Fig. 3). It runs from one side of the wall to the other in the right aisle, above the figures of a naked female bathing, and the caliph perform-

ing in gymnastic combats. As has been suggested by several authors, the wild ungulates depicted above these figures can very plausibly be identified as onagers (Almagro *et al.* 1975; Matthews & Henry 1989; Masseti 1990; Piccirillo *et al.* 1993; Vibert-Guigue & Bisheh 2007), being the latter world, according to Grubb (2005), the correct vernacular term to indicate the species *Equus hemionus* Pallas, 1775. These equids used to roam the Levant and the Upper Mesopotamian steppe in great numbers. Extinct since the 1930s, the Syrian onager or hemippe, *Equus hemionus hemippus* Geoffroy Saint-Hilaire, 1855, was the species that formerly ranged widely in this area, occurring in the northern Arabian peninsula, in Iraq, Syria, Palestine and Jordan (Uerpmann 1981) (Fig. 4). This was the smallest of modern wild equids – reaching scarcely a metre at the withers – representing the westernmost subspecies of a geographical cline that until recently ranged from the Levant across south-western Asia to Nepal and north to Chinese Turkestan and Mongolia (Corbet 1978). It formerly inhabited flood plains at lower altitudes than the larger Persian onager, *Equus hemionus onager* Boddaert, 1785 (Fig. 5), whose range probably extended through most of Iran and into Anatolia (Clutton-Brock 1981). The occurrence of the Syrian onager



FIG. 5. — Persian onagers, *Equus hemionus onager* Boddaert, 1785, in the Israeli wildlife reserve of Hai-Bar Yotveta, Eilat (photo by Marco Masseti).



FIG. 6. — The author photographed with two Persian onagers in the background, in the Jordanian wildlife reserve of Shaumari, Azraq, April 1992 (photo by Fabio Vianello).

in eastern Jordan is documented by the findings of its osteological remains in the Upper Pleistocene of the Azraq area (Clutton-Brock 1979). According to Clutton-Brock (1981), either the hemippe or the Persian onager undoubtedly played a significant role in the culture of ancient civilization, their meat being a relatively important source of food.

In the first half of the 1980s, the Royal Society for the Conservation of Nature planned to introduce Persian onagers into the Shaumari Wildlife Reserve, in the Eastern Desert of Jordan, near the extant settlement of Azraq, not far from Qasr al-Amra (Nelson 1985; Masseti 1990) (Fig. 6). Originally, this reserve was established for the reintroduction of the Arabian oryx, *Oryx leucoryx* Pallas, 1777, in 1983 (Nelson 1985; Abu Jafar & Hays-Shahin 1988; Masseti 1990). Subsequently, however the attempt to introduce the equid appears to have

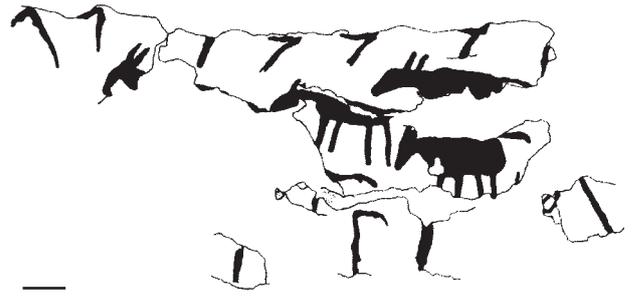


FIG. 7. — Art of the 7th-early 6th millennium B.C. in the arid zone. Detail of a painted fresco with wild equids, possibly onagers. Umm Dabaghiyah, Iraq (from Cauvin 2000). Scale bar: 5 cm.

been doomed to failure, since on my last visit to the reserve, on 18th November 2008, not a single individual was still in existence.

ONAGER HUNTING

It is commonly assumed that in the ancient Levant and Mesopotamia the Syrian onager was hunted for meat, and probably for its hide, but also for sport. In the 7th-early 6th millennium B.C. type-site of the Umm Dabaghiyah culture, the earliest known culture in the northern Iraq plain, some wall paintings have been recorded showing onager hunting scenes (Kirkbride 1975; Cauvin 2000) (Fig. 7). The local zoomorphic art involves animals of the steppe, which are apparently preferred to the domestic livestock that was most frequently represented earlier in the Neolithic (Cauvin 2000). The importance of hunting in the economy of Umm Dabaghiyah is further confirmed by the distinctive animal remains (Bökönyi 1986). Evidence from Umm Dabaghiyah clearly points to the site's role as a base for the hunting of wild animals, principally onager but also gazelle. Indeed, the bones of wild species are much more frequent (89 per cent in total), particularly those of onager, accounting for 70 per cent of the identifiable bones, with gazelles representing 16 per cent of the total. The lack of variation in size and kill-off patterns suggests that the onager was not domesticated at Umm Dabaghiyah (Bökönyi 1986).

Later, in the 7th century B.C., other archaeological documents place emphasis on Upper Mesopotamia, and more specifically the so-called Djazirah, as a geographical area particularly congenial to onager hunting. This is a part of northern Mesopotamia, comprised between the valley of the Tigris and the Euphrates (Masetti in press). Here the relief panels decorating the walls of the palace of Ashurbanipal (c. 645 B.C.) at Nineveh, portray royal hunts comprising among the wild game onagers (Uerpmann 1987), being shot with arrows and captured with ropes (Fig. 8). These images are generally considered among the best descriptions of the extinct and incompletely known Syrian *hemippus*, although certain authors, including Hall (1928), Epstein (1971), De Maigret & Fozzati (1980) and Masseti (2003), have noted that



Fig. 8. — Detail from the relief panels decorating the walls in the palace of Ashurbanipal (c. 645 B.C.) at Nineveh (British Museum).

the equids of Ashurbanipal’s hunt reliefs should probably not be taken as onagers but rather as wild or feral horse, in view of the shape of their heads, the conformation of the mouth and nostrils, and the general description of their morphology. In still more recent times we can mention a fragment of wall painting originating from Maison, Sálhyé (the ancient Dura Europos), in eastern Syria along the western bank of the Euphrates (Paris, Louvre: no. AO 17310, donated by the University of Yale in 1935). It represents a knight dressed in Parsi costume hunting onagers with bow and arrow. The scene was originally adjacent to that of a banquet, which has remained in situ. The Greek inscription which accompanies it details the name of the hunter and that of the artist and the date of execution, that is to say the year 194 A.D. In the following centuries Sassanid kings, such as Ardashir I (died 242 A.D.) and Bahram V (421-438 A.D.), engaged in onager hunting, were a recurrent subject in the decoration of the pages of Persian illuminated manuscripts and paintings between the early 14th and the first half of the 16th century (Ferber 1975; Cary Welch 1985). Hunting scenes are also often represented in the decoration of the western Near Eastern palaces and churches, as in the cases for example of the 7th century mosaics from Dayr al-‘Adas of the Bursa castle, south of Damascus, or the frescoes from Qasr al-Hayr al-Gharbi, also in Syria (Schlumberger 1948; Schlumberger & Le Berre 1986; Fowden 2004). Other ancient artistic representations of Asian wild asses are known from the 5th century mosaic of the “personification of Ktisis” at the Beiteddine Palace (Lebanon), and the floor mosaics in the Byzantine church of Petra (Jordan) (Studer 2001), referred to the 6th century.

In the majority of these artistic productions, the wild equids are characterised by a well-developed shoulder stripe, which is a phenotypical characteristic of the Nubian wild ass, *Equus africanus africanus* (Heuglin & Fitzinger, 1866), a variety which is now unfortunately extinct but that originally inhabited a portion of East Africa extending its distribution in the Near east throughout Syria and the northern Arabian peninsula (Uerpmann 1987; Clutton-Brock 1992). Among the various representations of equids with analogous characteristics, we can mention that of a page from the manuscript *Manāfi al-Hayawān* (“Uses of animals”) by Abū Sa’id ‘Ubayd Allāh ibn Bakhtishū’ (Contadini 1989), conserved in the al-Sabah Collection of the Kuwait National Museum (LNS 59 MS)



Fig. 9. — Page from the manuscript *Manāfi al-Hayawān* (“Uses of animals”) by Abū Sa’id ‘Ubayd Allāh ibn Bakhtishū’, conserved in the al-Sabah Collection of the Kuwait National Museum (LNS 59 MS).

(Fig. 9). Chronologically referred to the early fourteenth century A.D., it is decorated with ink and colours on paper (height 26 cm) (Jenkins *et al.* 1983). In any case, we can state that the shoulder-stripe is a constant characteristic of the representation of wild ungulates, either perissodactyls and artiodactyls, in the Persian paintings and miniatures of the 14th-16th centuries A.D. It is featured, for example, in the deer and wild sheep, *Ovis orientalis* Gmelin, 1774, portrayed in the illumination “Majnuin in the steppe among beasts”, a tale from the *Khamsa* (f. 103b; St. Petersburg, Saltikov-Shchedrin Public Library, inv. PNS Bukara) (Suleimanova 1985). This was written by Nizami Ganjavi (1141 to 1209), who is considered the greatest romantic epic poet in Persian literature (Rogers 2002). The subject of this romance is the story of the lovers Leyli and Majnun, deriving from Arabic sources but substantially reworked by Nizami. The *Khamsa* was a popular subject for lavish manuscripts illustrated with painted miniatures at the Persian and Mughal courts in later centuries.

In any case, we cannot rule out that it is the geographic location itself that indicates which equid species is intended in the wall-painting decoration. Thus, although animals were not depicted in a very precise, naturalistic way, specific identification is proposed based on the former distribution of that particular taxon in eastern Jordan. However, considering the size of the ears of the Qasr al-Amra running equids, one could equally well postulate that they are feral donkeys. The same applies to the animals shown in the manuscript *Manāfi al-Hayawān*, considering the large ears and the shoulder stripe typical of the true



FIG. 10. — Silver dish with remains of gilding showing a Sassanid king, probably Bahram V (*Bahram Gur*), hunting lions. British Museum, London.

wild ass and its domestic descendants. Moreover, no further help is offered by the observations made by Hauben (1984-1986) regarding the identification of the Qasr al-Amra equids: indeed, rather than clarifying the doubts these observations appear to compound them. I would therefore propose confining literary criticism to the sphere of textual interpretation, acknowledging the fact that the occasional capacity of the female mules to give birth has been known at length in zoological and zootechnical circles (Buffon 1755). It should also be recalled that Aristotle and Theophrastus (Borghini *et al.* 1983), followed by Pliny the Elder (*Naturalis historia* VIII: 173-174), had already described the species of the onagers that populated Syria (Buffon 1755), while still earlier the Enetoi of Asia Minor indicated by Homer in the Catalogue of the ships in the second book of the *Iliad* as breeders of “half-donkeys” (hemionoi), a word which the philologists have translated with “mules”. However, what Homer literally says is “hemionon genos”, indicating a breed of half-donkeys. But a breed of hybrids cannot exist (Azzaroli 1984).

The Umayyad wall paintings of Qasr al Amra indeed appear to be a continuation of the Syrian Late Antique tradition that comprised the subject of the hunt and especially that of onager hunting. In fact, the hunting scenes portrayed on much of the artistic production of the early Islamic world indicate that it had been a popular pastime since the period of the Sassanid kings (Curtis 1990). But, as in the case of the analogous decorations of other Umayyad castles in the Syrian Desert, such as Qasr al-Hayr al-Gharbi, as noted by Grabar (1985), the representation of princely activities such as hunting was none other than one of the first steps towards the formulation of a new iconography of the prince. In times of peace, in fact, the main activity of the Muslim emir was to train for war, something he did by practicing various types of hunting (Masseti 2006, 2009a). The new iconography had been launched several centuries before in Iran, in particular through the legendary exaltation of the exploits of the fourteenth Sassanid king of Persia, the aforementioned Bahram V, a great

favourite in the Persian tradition, which recounts numerous stories of his courage and his good look, his victories over the Romans, Turks, Indians and Africans, and his adventures in hunting and in love. He was called Bahram Gur, “Bahram of the onager” on account of his prowess in hunting, and hunting onagers in particular. Legend holds that he had seven palaces, each of a different colour; living in each was a Royal mistress who told Bahram a tale. The ruins of three of these towers are still pointed out by the peasants, as is the swamp where Bahram drowned while pursuing his gur (Fitzgerald 1938). Even in the eleventh century, the Rubaiyat, the poem written by the Persian writer Omar Khayyam, celebrated the glory of this legendary onager hunter:

*"They say the Lion and the Lizard keep
the Courts where Jamshyd gloried and drank deep:
And Bahram, that great Hunter - the Wild ass
Stamps o'er his Head, and he lies fast asleep."*

(Rubaiyat of Omar Khayyam, by Edward Fitzgerald 1938: quatrain 17)(Fig. 10).

In actual fact, the legend of Bahram Gur does not appear to have been codified before the late tenth-early eleventh century, when the poet Firdawsi wrote the famous Iranian epic *Shâh Nâmeh*, or “*The Book of Kings*”. The *Shâh Nâmeh* tells the mythical and historical past of greater Iran from the creation of the world up to the Islamic conquest of Persia in the 7th century. This poem is regarded as the crown jewel of Persian literature and it is cherished by all Iranians (including non-Persian ethnic groups), as well as the Persian speaking societies of Afghanistan, Tajikistan and Central Asia.

OTHER ZOOMORPHIC SCENES IN THE GREAT HALL

The onager hunt is not the only activity of this type depicted in the great hall of Qasr al-Amra. The south wall of the eastern bay of this space is adorned with a scene of ungulate butchering (cf. Vibert-Guigue & Bisheh 2007) (Fig. 11). The images of these bovids have been referred to the species *Gazella subgutturosa* (Güldenstaedt, 1780), also known as the goitred gazelle. However, in the same way as the onagers of the hunting scene already described, the artiodactyls can be again identified at species level more on biogeographical than anatomical grounds. The shape and length of the horns of the animals depicted strongly suggest that we are dealing with oryxes, probably of the species *Oryx leucoryx* (Pallas, 1777), the only species of this African genus dispersed in the southwestern Near East and the Arabian peninsula. Moreover, the fact that in this reproduction the animals are dark coat is misleading, since in reality Arabian oryxes have a very pale/whitish colouring (Fig. 12).

Each of the square panels, into which the eastern vault of the great hall ceiling is divided, depicts scenes of domestic activity (Lankaster Harding 1959), portraying a building project and various craft activities (Piccirillo *et al.* 1993).



FIG. 11. — Detail of the wall paintings of the great hall of Qasr al-Amra, with a scene of gazelle butchering (from Vibert-Guigue & Bisheh 2007).



FIG. 12. — Endemic to the south-western Near East, the Arabian oryx, *Oryx leucoryx* (Pallas, 1777), has a whitish coat colour. Shaumari Wildlife Reserve, Jordan (photo by Marco Masseti).



FIG. 13. — Images of chukar partridges, *Alectoris chukar* (Gray J. E., 1830), are painted along the tympanum in the southern recess of the great hall of Qasr al-Amra.

Among them are the representations of two one-humped camels, *Camelus dromedarius* Linnaeus, 1758, used as beasts of burden. Birds, such as peacocks, *Pavo cristatus* (Linnaeus, 1758), and partridges, are also portrayed in some of the details of the wall decoration of the great hall. Above the scenes depicted in the right aisle are the figures of two peacocks, alongside the ancient Greek inscription ΘΑΡΑ ΝΙΚΗ, which appears to refer to a victory (Almagro *et al.* 1975). In this case, the source of inspiration in the canonical decorative motifs of classical art is particularly evident. Indeed, the image of this animal had been widely used since antiquity for ornamental purposes and was among those most appreciated for the embellishment of gardens and parks (Grimal 1990; Masseti 2002). In pagan culture, the peacock was considered a symbol of immortality (Toynbee 1973), and in early Christianity as the allegory of the soul's rebirth and of resurrection (Impelluso 2003). Its meat was considered incorruptible, like the symbol of Christ in his tomb; in the Islamic world, instead, the bird symbolises the universe or the great celestial bodies of the sun and the moon (Biedermann 2004). Since ancient times, peacocks were birds imported to the Near East and along the shores of the Mediterranean basin, their homeland being India

and the Middle East (Lever 1987). In Roman times, the bird was also particularly valued on the tables of gourmets (Toynbee 1973).

Characteristic of the steppes and deserts of south-western Asia, chukar partridges, *Alectoris chukar* (Gray J. E., 1830), are instead evoked in the paintings which surround the tympanum in the southern recess of the great hall (Piccirillo *et al.* 1993). A flock of these birds is represented around the image of an enthroned ruler (or prophet-king), very likely the caliph Al-Walid I himself. The birds are represented in a sort of procession around the arch and perched on the columns of the same (Fig. 13). The procession recalls the plaques of stucco birds decorating the Sassanid royal audience halls (*iwan*) (Evans & Ratliff 2012), and in their unsophisticated design, the eighth century stucco birds at Khirbat al-Mafjar, 5 km north of the Palestinian town of Jericho (Behrens-Abouseif 1997). In Qasr al-Amra, the columns with partridges surrounding the caliph image are also reminiscent of the canon tables on the



FIG. 14. — Chukar partridges, *Alectoris chukar* (Gray J. E., 1830), are particularly popular in the decoration of Islamic artefacts (photo by Marco Masseti).



FIG. 15. — Fragment of plate decorated in monochrome lustre. Mesopotamia or Egypt, 10th century A.D. (Florence, private collection).

prefatory pages of the Gospel books (Fowden 2004; Evans & Ratliff 2012). The process of selecting images from the large visual repertoire of antiquity and then adapting them entailed the intellectual involvement of the commissioner (and perhaps also the artist), who was thus shaping a new Umayyad cultural identity (Evans & Ratliff 2012). A polytypic sedentary galliform, the chukar partridge, is the representative of the genus *Alectoris* Kaup, 1929, with the widest geographic diffusion, ranging from the eastern Mediterranean region and many of its islands, to the Near East and central Asia, including the Himalayan mountain range as far as China (Cramp & Simmons 1980; Johnsgard 1988) (Fig. 14). The iconographic theme of the partridge is particularly popular in the decoration of Islamic artefacts (Masetti & Cantagalli Masetti 1991) (Fig. 15). About this, it is interesting to note that in a tile in the shape of a star from Kashan (Iran), dated



FIG. 16. — Tile in the shape of a star from Kashan (Iran), dated to the first half of the 14th century. The date of the year 738 after Hejri is indicated in the artefact (Florence, private collection).

to the first half of the 14th century (the date of the year 738 after *Hejri* is indicated in the artefact), an adult individual is portrayed, while possibly in the act of distracting a potential predator from its own offspring by staging the breaking of a wing (Florence, private collection) (Fig. 16). It seems that this motif derives from the Late Hellenistic and Byzantine tradition, too (Masetti & Cantagalli Masetti 1991). It has been proposed that the symbolism of the partridge is erotic (Baer 1974; Fowden 2004). More in particular, in Greek tradition the partridge was associated with sexuality, as Aristotle wrote in his *Historia animalium* (29) (Behrens-Abouseif 1997). Thus, we cannot exclude that this same symbolism was attached to the partridge representations in Qasr al-Amra. The multiple representation of this bird surrounding the caliph image would seem to provide support for the interpretation of the erotic iconography of part of the wall paintings. Furthermore, certain Arab bestiaries partly justified the belief that the bird took possession of the eggs of her companions, albeit only when her own had been damaged by some kind of accident (Herrero Marcos 2006). In such cases, driven by the maternal instinct the partridge would tend to take over the eggs of her fellow birds, hatching them and rearing the young. In the Western World, the partridge has also been considered a symbol of the Virgin Mary (Impelluso 2003).

THE *TEPIDARIUM*

Moving from the great hall to the three bathing rooms, the nature of the decoration and pictorial composition we find there suggests the work of a different hand from the one that decorated the great reception hall of this Umayyad residence (Almagro *et al.* 1975). In the decoration of the entire group of paintings of the *tepidarium*, the artists seem to employ a

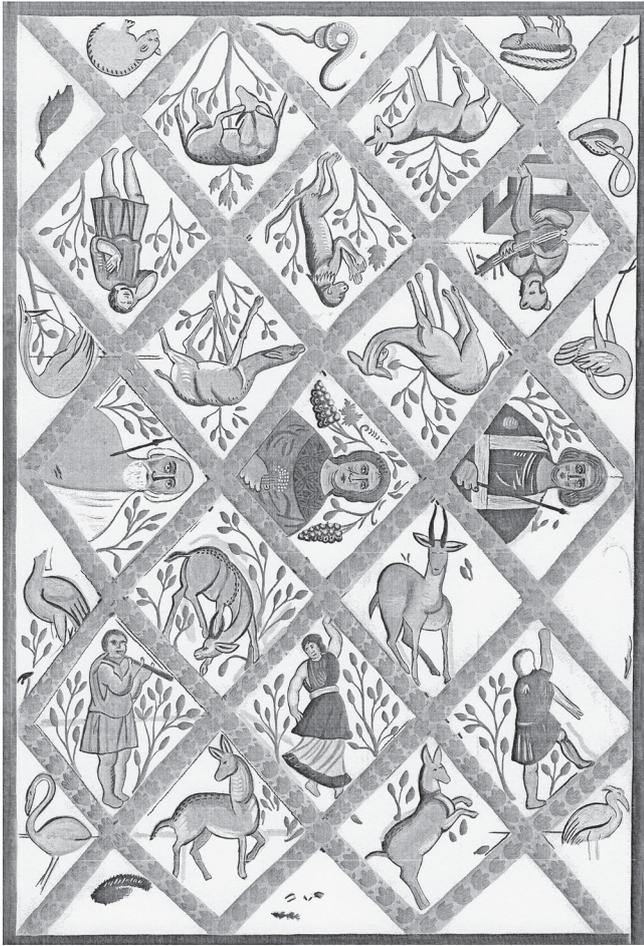


FIG. 17. — The vault of the tepidarium of Qasr al-Amra is divided into lozenges; diamond-shaped patterns are outlined with leaves, with a figure inside each. They depict human figures representing the three stages of man's life, a man playing a flute, a dancing women, a snake, several wading birds, a bear playing a musical instrument, gazelles in various postures, a monkey standing on its hind legs, and other mammals.

freer and more naturalistic technique than the “palace” artists who decorated the great hall. Both groups of artists reveal marked differences, not only of style, but also in the motifs they use and their decorative technique. In both, according to Almagro *et al.* (1975) but above all in the “palace” painters, the art critics find features which suggest they may be of local origin. However, in the *tepidarium* the wall decorations become more realistic (Ali 1999). In the vault of this room, the painters employed a fairly classical design. The space is divided into lozenges, the diamond-shaped patterns are outlined with leaves, with a figure inside each (Ali 1999) (Fig. 17). Painted within the lozenges are human figures representing the three stages of man's life, a man playing a flute, a dancing women, a snake, several wading birds, a bear playing a musical instrument, gazelles in various postures, a monkey standing on its hind legs, and other mammals (Ali 1999) (Fig. 18). The majority of these zoological elements represent species that were connected, in some way, with the life of court, whether they were animals selected for hunting purposes or for aesthetic reasons.



FIG. 18. — Detail of the paintings of the *tepidarium* vault of Qasr al-Amra (photo by Fabio Vianello).

Clearly, such a context could not be without the brown bear, *Ursus arctos* Linnaeus, 1758, one of the best-loved animals for court pastimes and amusements of all time. Since as far back as Roman times, at the very least, this carnivore has frequently been employed in circus activities (Toynbee 1973), despite the fact that it was certainly not the easiest of creatures to display in the amphitheatres (King 2002). According to the Latin scholar Seneca (*De Ira*, 2.31.6), bears were also tamed and kept by the Romans as pets. In the Christian world of Europe, this carnivore was regarded as the consummate prey in the hunts of kings and sovereigns. In the Iberian peninsula, more in particular, both Alphonse XI of Castile (1311-1350) and John I of Portugal (1385-1433) preferred it to the hart, *Cervus elaphus* Linnaeus, 1758, and, even to the wild boar, *Sus scrofa* Linnaeus, 1758 (Cummins 1988). The description of bear hunting in the *Libro de la Monteria* by Alphonse XI attests a primitive obsession and an epic narration featuring men, dogs – generally Pyrenean mastiffs – and prey set against the background of the sharp, snow-clad peaks of the *sierras* of Castile, in comparison to which the deer hunts of northern Europe appear spineless and almost amateur affairs. However, possibly one of the roles in which bears were most widely exploited was that of the “dancing bears”, an expression which even now continues to indicate animals trained to perform specific exercises, such as dancing to the sound of music. The carnivore was taken around the country fairs by its trainer, and the public would pay to see it perform. In many countries, the tradition of dancing bears has continued up to the present (cf. Zannier 1999) (Fig. 19). Indeed, although the bear disappeared from western Europe not later than the 20th century (Gastou 1987), it is still very much alive in the Balkans, Egypt, Anatolia and the remainder of the Near East (Fig. 20). In the *tepidarium* vault of Qasr al Ambra we can see a brown bear playing a kind of lute, possibly an *oud*, a pear-shaped, stringed instrument, similar to a modern western lute without frets (Fig. 21). However the image appears to allude to a rather improbable situation, such as to suggest



FIG. 19. — Syrian bear with its Egyptian trainer in a photograph by Zangaki dating to the second half of the 19th century (from Zannier 1999).



FIG. 20. — Tame bear in the town of Korçe, in south-eastern Albania (photo by Luigi Forte).

that a human being may indeed be concealed beneath the false appearance of the bear.

At present, the taxonomic situation of brown bears is still not fully determined, seven to eleven subspecies being recognised, with large differences in body size and fur colour (Jakubiec 1993). Specimens from the Near East are broadly referred to the subspecies *Ursus arctos syriacus* (Hemprich & Ehrenberg, 1828), which is distinguished from the European brown bear,



FIG. 21. — Brown bear depicted in a detail of the *tepidarium* vault of Qasr al Amra, while playing a kind of lute, possibly an *oud* (from Vibert-Guigue & Bisheh 2007).

Ursus arctos arctos (Linnaeus, 1758), by an averagely paler pelage, generally a uniform yellowish or greyish white. This variety became extinct in Syria in historical times (Masseti 2009b). Talbot (1960) and Cowan (1972) confirmed the existence of brown bears on the slopes of the Alawit Mountains (Al Nusyriain Mountains), north of Lattakia (Syria), up to the 1960s (Harrison 1968; Harrison & Bates 1991). The official version, however, is that the last Syrian bear was recorded in 1927, along the Nahal Al-Kabir, again in the vicinity of Lattakia, and it is believed that this carnivore inhabited Galilee only up to the end of the 19th century (Mendelsshon & Yom-Tov 1999). It has been reported as still surviving in the mountains of Kurdistan, in northern and eastern Iraq (Cowan 1972). According to Harrison (1968) and Harrison & Bates (1991), it seems clear that this subspecies extends to Asia Minor, Iraq, Transcaucasia and northern Persia.

Like the *oud*-playing bear, the monkey portrayed in one of the lozenges of the Qasr al Amra *tepidarium*, must also have been imported from far afield. But, unlike the carnivore which could have come from the not distant Alawit Mountains, in Syria, in the specific case of the primate, it must have arrived either from the southern Arabian peninsula or from the African territories beyond the Red Sea. Even today these areas represent the distributional range of a cynocephalus primate, the hamadryas baboon or sacred baboon, *Papio hamadryas* (Linnaeus, 1758), and the artistic representation on the *tepidarium* ceiling would appear, in fact, to refer to possibly a subadult individual of this species (Fig. 22). The monkey is dispersed in the arid zone of the Red Sea coast of Sudan, in Eritrea, Ethiopia and northern Somalia (Hill 1970; Funaioli 1971; Haltenorth & Diller 1977; Al-Safadi 1994; Yalden *et al.* 1996; Groves 2005). It occurs in two populations which are now completely separated by the Red Sea (Masseti & Bruner 2009), also being found in the mountainous south-western corner of the Arabian peninsula up to western Yemen, in particular near Aden (Thomas 1900; Elliot 1913; Starck & Frick 1958; Harrison 1964; Kummer *et al.* 1981; Nader 1990; Harrison & Bates 1991; Al-Jumaily 1998) (Fig. 23). This is one of the monkeys best known in the Western World since antiquity (Masseti & Bruner 2009), and it has been suggested that in ancient times it was dispersed further north, as far as the territories of Nubia and even Egypt (Osborn & Osbornová 1998). The latter country is also regarded as the “type



FIG. 22. — The artistic representation of a species of monkey on the *tepidarium* ceiling of Qasr al Amra seems to refer a subadult individual of hamadryas baboon, *Papio hamadryas* (Linnaeus, 1758), a species dispersed in the arid zone of the Red Sea coast of southern Saudi Arabia and eastern Africa (from Vibert-Guigue & Bisheh 2007).



FIG. 23. — Skull of a subadult female of Arabian sacred baboon, *Papio hamadryas arabicus* (Thomas, 1900). This subspecies occurs in the mountainous south-western corner of the Arabian peninsula up to western Yemen, in particular near Aden (photo Saulo Bambi; courtesy of the Museo di Storia Naturale dell'Università di Firenze, Sezione di Zoologia "La Specola").

locality” of the species (Napier 1981; Groves 2001, 2005), even though sacred baboons have long since vanished from these parts. In any case, Linnaeus described the taxon in his *Systema Naturae* (1758) through examination of specimens from “Egypt” and “Upper Egypt” (Groves 2001). Exported from its natural homeland since ancient times, the hamadryas continued to be transported to the menageries of the nobility and the princely courts of the Western and the Islamic worlds throughout historic times.

Several of the animals evoked in the decoration of the *tepidarium* vault represent species of local fauna. One example is the sole reptile portrayed, the desert black snake or black cobra, *Walterinnesia aegyptia* Lataste, 1887, a highly venomous, medium-sized snake, which can grow to lengths of 1.3 meters, completely black in colour (Fig. 24). This is, however, a tentative attribution. In reality, the black crossbars on the belly of the snake image are rather too distinct for



FIG. 24. — Known as a snake which become aggressive when disturbed, the black cobra, *Walterinnesia aegyptia* Lataste, 1887, appears to have been portrayed in such an attitude by the early 8th century painters of Qasr al-Amra (from Vibert-Guigue & Bisheh 2007).



FIG. 25. — Detail of the vault decoration of the Qasr al-Amra *tepidarium* illustrating a greater flamingo, *Phoenicopterus ruber* Linnaeus, 1758 (from Vibert-Guigue & Bisheh 2007).

W. aegyptia, although they are normally discernible as black hind markings on the otherwise grey-blackish belly. The dorsum is always blackish to deep black, and there is no sharp contrast between the upper and underside parts. Nonetheless, there are no other reptiles in this area more closely resembling this figure. One alternative possibility could perhaps be the black-headed snake, *Telescopus nigriceps* Ahl, 1924, which is grey above with black, thin crossbars, although its belly is black (Nilson & Rastegar-Pouyani 2013), making this second possibility less likely than *W. aegyptia*. The black cobra is native to south-western Asia, where it is found in Egypt, Jordan, Lebanon, Palestine, and north-western Saudi Arabia (Ugurtas *et al.* 2001). Known as a snake which become aggressive when disturbed, it appears to have been portrayed in such an attitude by the early 8th century painters of Qasr al-Amra.

Many birds, such as greater flamingos, *Phoenicopterus ruber* Linnaeus, 1758 (shown twice) (Fig. 25), common cranes, *Grus grus* (Linnaeus, 1758) (4 times), herons (once), and other wetland species, may have inhabited the temporary puddles – and their surroundings – created in the desert by



FIG. 26. — The phenotypes of the wildcats occurring at present in the Levant can be referred to those of the African wildcat, *Felis silvestris libyca* Forster, 1780. Hair-Bar Yotveta, Eilat (photo by Marco Masseti).



FIG. 27. — Detail of the vault decoration of the Qasr al-Amra tepidarium illustrating a wild cat arching its back and ruffling its fur (from Vibert-Guigue & Bisheh 2007).



FIG. 28. — Detail of the ceiling decoration of the Qasr al-Amra tepidarium illustrating a marbled polecat curving its tail above its back to eject the contents of its anal glands (from Vibert-Guigue & Bisheh 2007).

seasonal rains. Today, in the area of Azraq, grey herons, *Ardea cinerea* Linnaeus, 1758, and little egrets, *Egretta Garzetta garzetta* Linnaeus, 1766, are considered as migrant birds, seen regularly on passage usually in fair to large numbers, while common cranes are winter residents; flamingos are instead vagrant, irregular to scarce or very rare (Matthews & Henry 1989; Andrews 1995). In the Near East, the hunting of wintering cranes is a practice well-documented since antiquity, as in the case of the osteological remains of *Grus* sp. provided by the archaeological exploration of Isin-Larsa (c. 20th century B.C.), Tell Yelkhi (Hamrin Basin, eastern Iraq) (Fedele 2000). All these birds are, also, traditionally regarded as decorative components of aristocratic gardens and parks (Foster 1969; Grimal 1990). And that is not all: for example, white pelicans, *Pelecanus onocrotalus* Linnaeus, 1758, with remiges sheared off, are still kept as pets for people's amusement in



FIG. 29. — Adult male of Persian gazelle, *Gazella subgutturosa subgutturosa* (Güldenstaedt, 1780), photographed in the eastern-most range of its Palaearctic distribution, the Turkish reserve of Ceylanpinar (Şanlıurfa, eastern Anatolia) (photo by Marco Masseti).

several islands of the eastern Mediterranean, such as Mikonos (Greece) and Cyprus.

Two illustrations, respectively of a wildcat, *Felis silvestris* Schreber, 1777 (Fig. 26), and a marbled polecat, *Vormela peregusna* (Güldenstädt, 1770), can be added to the list of wild mammals that can still be reported today from the area of Qasr al-Amra. More specifically, the cat appears to have been portrayed while arching its back and ruffling its fur as if to intimidate a hypothetical adversary (Fig. 27). The polecat too has been represented in a very typical attitude. Finding itself in danger, the carnivore has its head thrown back, teeth bared and fur standing on end, and its tail curled above its back. In this position the animal is ready, if necessary, to eject the contents of its anal glands (Aulagnier *et al.* 2008) (Fig. 28). Indeed, local Jordanian people refer to this animal in Arabic as *fessyah*, equivalent to “stinky”, due to its unpleasant and offensive smell when alarmed or trapped (Rifai *et al.* 1999).

PERSIAN GAZELLES

In comparison to the great hall, the originality of the zoomorphic decoration of the vault of the tepidarium also lies in the artistic treatment reserved for the images of the gazelles. These can certainly be referred to the subspecies *Gazella subgutturosa subgutturosa* (Güldenstaedt, 1780), the Persian gazelle. Unlike the representation of the analogous subject occurring in the great hall, the ungulates portrayed in the tepidarium are characterised by an accurate morphological description, featuring a precision in the reproduction of the naturalistic elements comparable to that of modern treatises and scientific textbooks. They are rather heavily built ungulates, with fairly long necks, with the male horns long and lyrate, being the sole variety among all the gazelles which still inhabit the Near Eastern region with hornless females (cf. Harrison & Bate 1991) (Fig. 29). This is the same subspecies portrayed in the bas-relief hunting-scenes of the Assyrian king Ashurbanipal (Masetti 2003), in the

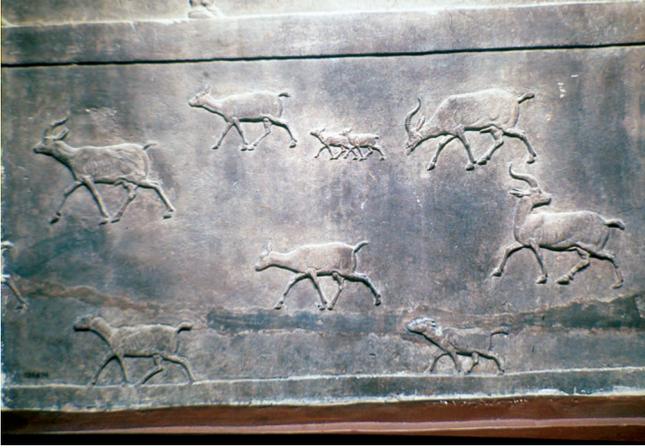


FIG. 30. — Detail of the bas-relief hunting scenes of the Assyrian king Ashurbanipal at Nineveh (c. 645 B.C.), in northern Iraq, showing a herd of *G. subgutturosa subgutturosa* (British Museum, London).



FIG. 31. — Detail of the vault decoration of the Qasr al-Amra *tepidarium* illustrating an adult female of *G. subgutturosa subgutturosa* (photo by Fabio Vianello).

not distant palace of Nineveh (c. 645 B.C.), in northern Iraq (Reade 1983; Matthiae 1998) (Fig. 30). At present, the Persian gazelle is distributed from the former Soviet Union to the Levant (Kingswood & Kumamoto 1988). In south-east Asia, this subspecies is recorded from south-western Anatolia, Syria and northern Iraq (Harrison & Bate 1991; Masseti 2004). In the vicinity of Qasr al-Amra, the present southern range of the nominate subspecies *G. subgutturosa subgutturosa* appears to overlap with the northern range of *G. subgutturosa marica* (Thomas, 1897), also known as the Arabian sand gazelle (Kingswood & Kumamoto 1988; Masseti 2004), characterised by the occurrence of the horns in adult females. In the ceiling decoration of the *tepidarium*, Persian gazelles are portrayed in different attitudes (Fig. 31). One female is represented while sniffing around (Fig. 32), whereas a male is instead portrayed while scratching an ear with one of the hind legs (Fig. 33). Precisely this latter image refers to another episode of the legend of Bahram Gur, that of the tale of the Sassanid king and his mistress, the beauti-



FIG. 32. — This female of Persian gazelle is represented on the vault decoration of the Qasr al-Amra *tepidarium* while sniffing around (photo by Fabio Vianello).



FIG. 33. — Detail of the vault decoration of the Qasr al-Amra *tepidarium* illustrating a male gazelle scratching an ear with one of its hind legs (photo by Fabio Vianello).

ful but insolent Azadeh, who challenged him to strike with a single arrow the ear and leg of a gazelle. With great skill, Bahram Gur shot a single arrow that wounded the animal while it was scratching one of its ears with a hind leg. The story ended unhappily for Azadeh, as she declared such skill to be demonic, and Bahram, in a fury, threw her off the camel and trampled her to death under its hooves (cf. Falk 1985). Thus, the motif of the gazelle scratching its ear with its hind leg is clearly associated with this tale (Shalem 2004) (Fig. 34). The story became a favourite theme in both works of the Sassanid period and the arts of Islam.

It seems very plausible that the other images decorating the vault of the *tepidarium* are also inspired by episodes in the great Iranian epics, such as the *Shahnameh*, and other traditional Sassanid and Muslim texts. Western craftsmen of Late Antiquity, possibly even Christian, were employed in Qasr al-Amra for the early 8th century artistic evocation of traditional eastern legends, profoundly rooted in the Sassanid past.



FIG. 34. — Detail of a miniature from the *Khamsa*. The motifs of the gazelle scratching its ear with its hind leg is clearly associated with the tale of Bahram Gur (f. 158b; St. Petersburg, Saltikov-Shchedrin Public Library).

CONCLUDING REMARKS

Matthews & Henry (1989) were among the first to observe that some of the details of the wall paintings of Qasr al-Amra represent local fauna, including birds, carnivores, and ungulates. Also according to Ali (1999), these zoomorphic images portrayed animals that could probably have been seen in the area when the palace was built. However, of all the species represented in the wall decorations of the Umayyad palace, not many still inhabit the desert and the steppe that surround the archaeological site. The Syrian onager vanished in historical times. It was reported from its final refuge in the region of Jabal Abdul Aziz, in north-eastern Syria, around the 1930s (Harrison 1972; Masseti 2004). Moreover, the species must have disappeared much earlier from the Jordanian region of Azraq and the basalt desert, where it was presumably still very common in Umayyad times (Nelson 1973). Common enough to justify the construction of Qasr al-Amra as a desert pavilion for equid hunting. The other ungulate characteristic of the region, the Persian gazelle, appears to continue to survive there, although with a very scattered occurrence, its Jordanian range being restricted to the remote and inaccessible eastern areas (Mountfort 1965; Abu Jafar & Hays-Shahin 1988; Masseti 2004). Towards the end of the 1980s, the species was introduced into the Shaumari Wildlife Reserve (Masetti 1990). Wildcats and marbled polecats are still reported, instead, from the region of Azraq (Nelson 1973; Amr 2000; Masseti 2009b). Indeed, despite the continuous changes in the natural habitats of Jordan, the distribution of the latter carnivore appears to have actually expanded (Rifai *et al.* 1999).

The occurrence of a hamadryas baboon in the wall paintings of Qasr al-Amra also documents the importation of exotic

animals even from very distant parts. The monkey, as we have already seen, could only have come from the southern Arabian peninsula or, at most, from East Africa. Its presence in Jordan, however, cannot be explained, as very hastily – and without the support of plausible scientific argumentation – proposed by Ali (1999), who stated that “... because before the Suez Canal was dug, Greater Syria was connected to Africa by land and many animals crossed over”. This fact cannot be explained on geological and geomorphological grounds. On the contrary, the importation by man of African fauna, even of large dimensions, into the Levant and, in particular, into the territories of the present-day Hashemite Kingdom of Jordan, is abundantly documented since antiquity. For example, in the Byzantine mosaic (531 A.D.) of the old Diaconicon Baptistery of the basilica of Mount Nebo, above the town of Jericho, a zebra is shown next to a black man leading an ostrich, *Struthio camelus* Linnaeus, 1758, by a rope (Piccirillo 1986). Alongside these figures is the image of a kind of dromedary somehow characterised by the phenotypic patterns of a giraffe. Information on the human-induced translocation of exotic fauna can also be derived from the artistic production of Near-Eastern Bedouin people (Borzatti von Löwenstern & Masseti 1991, 1994, 1995; Borzatti von Löwenstern *et al.* 1993). For example, several images of the rock art production of the Hisma basin, in the southern desert of Jordan portray bovids characterised by long, twisted horns, completely alien to the local zoogeography and that might date to the Thamudic period, that is between about 500 B.C. and 1000 A.D. (Borzatti von Löwenstern & Masseti 1991). It cannot be ruled out that the ungulates in these images represent an antelope species only recently recorded from the Arabian peninsula, the lesser kudu, *Tragelaphus imberbis* (Blyth, 1869). This was an African twisted-horn bovid unknown in the Near East until Harrison (1972) and Büttiker (1982) respectively recorded two individual specimens, the first from Yemen and the second from the Medina province, in Saudi Arabia (Corbet 1978, 1984). It is not certain, however, whether the two specimens came from wild populations (Harrison & Bates 1991), or from captive stocks. The lesser kudu inhabits the arid thornbush country areas of East Africa, from Ethiopia to Tanzania up to 1300 m (Funaioli 1971; Haltenorth & Diller 1977; Grubb 2005) and to date there is no palaeontological evidence for its presence in south-western Asia. Indeed, according to Tchernov (1979), fossils of modern African antelopes, such as *Gazella* sp. and *Alcelaphus* sp. but not *Tragelaphus* sp., are known in the Levant. It cannot, however, be excluded that with more extensive surveys of Middle and Lower Pleistocene fossil deposits in the Near East ulterior remains of African bovids will be recovered, in the same way as the freshwater African elements, such as *Hippopotamus amphibius* Linnaeus, 1758, *Crocodylus niloticus* Laurenti, 1768, *Trionyx triunguis* Forsskål, 1775, or fish representatives of the genus *Tilapia* Smith, 1840, etc., were found in abundance throughout the Quaternary (Masetti 2003; Corsini-Foka & Masseti 2008).

A carved figure that may represent a giraffe, from Jebel Magraisha (dated after the beginning of the 2nd millennium A. D.), and that of a deer, possibly *Cervus elaphus* Linnaeus,

1758 (first half of the 1st millennium A. D.), have also been found in the northern Nafud desert, within the Jordanian borders (Borzatti von Löwenstern & Masseti 1991). These animals too are unknown among the local fauna and there is no palaeontological evidence of their former occurrence in the region. Thus, it may be that the sources of inspiration of the Thamudic artists who executed these images were captive animals that they probably knew from abroad or from a traditional iconographic repertoire. Moreover, the importation into the Levant, not only of zoological species of different and exotic origin, but also of durable parts of them, such as ostrich egg shells, hippopotamus ivory and/or elephant tusks, was merely the repetition of a practice which had been going on for centuries – if not for millennia – whenever political and economic conditions were favourable (Masetti 2012). This tradition has its oldest roots in the trade of faunal and botanical elements that took place between the Near East, North Africa, the Mediterranean basin and the Middle East since prehistoric times (Masetti 2000, 2001, 2003, 2009a).

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REFERENCES

- ABU JAFAR M. Z. & HAYS-SHAHIN C. 1988. — Re-introduction of the Arabian oryx into Jordan, in DIXON A. & JONES D. (eds), *Conservation and Biology of Desert Antelopes*. Christopher Helm, London: 35-46.
- ALI W. 1999. — *The Arab Contribution to Islamic art. From the Seventh to the Fifteenth Centuries*. The American University in Cairo Press; The Royal Society of Fine Arts, Jordan, 176 p.
- AL-JUMAILY M. M. 1998. — Review of the mammals of the Republic of Yemen. *Fauna of Arabia* 17: 477-502.
- ALMAGRO M., CABALLERO L., ZOZAYA J. & ALMAGRO A. 1975. — *Qasayr 'Amra. Residencia y baños omeyas en el desierto de Jordania*. Ministerio de Asuntos Exteriores, Dirección General de Relaciones Culturales; Junta para la Protección de Monumentos y Bienes Culturales en el Exterior; Instituto Hispano-Arabe de Cultura, Madrid, 208 p.
- ALMAGRO GORBEA A. 1981. — La residencia de Qasayr 'Amra en el desierto de Jordania, in ALMAGRO GORBEA A., *Tres monumentos islámicos restaurados por España en el mundo árabe*. Insitituto de España, Madrid, 131 p.
- AL-SAFADI M. M. 1994. — The hamadryas babooun, *Papio hamadryas* (Linnaeus, 1758) in Yemen (Mammalia, Primates, Cercopithecidae). *Zoology in the Middle East* 10: 24-36.
- AMR Z. S. 2000. — *Jordan Country Study on Biological Diversity. Mammals of Jordan*. United Nations Environment Program; National Library, Amman, 100 p.
- ANDREWS I. J. 1995. — *The Birds of the Hashemite Kingdom of Jordan*. I. J. Andrews, Midlothian, 185 p.
- AULAGNIER S., HAFFNER P., MITCHELL-JONES A. J., MOUTOU F. & ZIMA J. 2008. — *Guide des mammifères d'Europe, d'Afrique du Nord et du Moyen-Orient*. Delachaux et Niestlé, Paris, 271 p.
- AZZAROLI A. 1984. — L'inizio dell'addomesticamento dei grandi mammiferi. *Contributi del Centro Linceo Interdisciplinare di Scienze Matematiche e Loro Applicazioni* 68: 29-93.
- BAER E. 1974. — A group of north Iranian craftsmen among the artists of Khirbet el-Mafjar? *Israel Exploration Journal* 24: 237-240.
- BALTY J. 1986. — Iconographie classique et identités régionales: les mosaïques romaines de Syrie. *Iconographie classique et identités régionales. Bulletin de Correspondance Hellénique Sup.* 14: 115-132.
- BEHRENS-ABOUSEIF D. 1997. — The lion-gazelle mosaic at Khirbat al-Mafjar, in NECIPOGLU G. (ed.), *Muqarnas XIV: An Annual on the Visual Culture of the Islamic World*. E. J. Brill, Leiden: 11-18.
- BIEDERMANN H. 2004. — *Enciclopedia dei simboli*. Garzanti Editore, Milano, 654 p.
- BLÁZQUEZ J. M. 1996. — Arte bizantino antiguo de tradición clásica en el desierto jordano. Los mosaicos de Um er-Rasas. *Goya* 255: 130-143.
- BÖKÖNYI S. 1986. — The equids of Umm Dabaghiyah: a preliminary report. *Iraq* 35: 9-11.
- BORGHINI A., GIANNARELLI E., MARCONI A. & RANUCCI G. (eds) 1983. — *Gaio Plinio Secondo. Storia naturale. II. Antropologia e zoologia. Libri 7-11*. Giulio Einaudi editore, Torino, vi + 709 p.
- BORZATTI VON LÖWENSTERN E. & MASSETI M. 1991. — On the twisted-horn antelopes carved in the rocks of some wadies of the Jordan southern desert. *Studi per l'Ecologia del Quaternario* 13: 143-148.
- BORZATTI VON LÖWENSTERN E. & MASSETI M. 1994. — Evidence of Epipalaeolithic art in southern Jordan. *Studi per l'Ecologia del Quaternario* 16: 27-33.
- BORZATTI VON LÖWENSTERN E. & MASSETI M. 1995. — Rock carvings of cattle in the Hisma Basin, southern Jordan desert. *Studi per l'Ecologia del Quaternario* 17: 65-78.
- BORZATTI VON LÖWENSTERN E., MASSETI M. & VIANELLO F. 1993. — On the former distribution of the ostrich (*Struthio camelus syriacus* Rothschild 1919) in southern Jordan. *Studi per l'Ecologia del Quaternario* 15: 75-80.
- BOWERSOCK G. W. 1992. — *Roman Arabia*. Harvard University Press, Cambridge, Massachusetts, 242 p.
- BROWN P. 1971. — *The World of Late Antiquity*. Thames and Hudson, London, 216 p.
- BUFFON G.-L. LECLERC COMTE DE 1755. — *Histoire naturelle. Quadrupèdes, Vol. 2*. Imprimerie Royale, Paris, 534 p.
- BÜTTIKER W. 1982. — Mammals of Saudi Arabia. The lesser kudu (*Tragelaphus imberbis* Blyth, 1869). *Fauna of Saudi Arabia* 4: 483-487.
- CARY WELCH S. (ed.) 1985. — *Treasures of Islam*. Artline Editions, Bristol, 324 p.
- CAUVIN J. 2000. — *The Birth of the Gods and the Origins of Agriculture*. Cambridge University Press, Cambridge, 259 p.
- CLUTTON-BROCK J. 1979. — The fossil fauna from an Upper Pleistocene site in Jordan. *Journal of Zoology* 162: 19-29.

- CLUTTON-BROCK J. 1981. — *Domesticated Animals from Early Times*. Heinemann; British Museum (Natural History), London, 208 p.
- CLUTTON-BROCK J. 1992. — *Horse Power. A History of the Horse and the Donkey in Human Societies*. Natural History Museum Publications, London, 192 p.
- CONTADINI A. 1989. — The Kitāb Manāfi' al-Hayawān in the Escorial Library. *Islamic Art* 3: 33-57.
- CORBET G. B. 1978. — *The Mammals of the Palaearctic Region: a Taxonomic Review*. British Museum (Natural History); Cornell University Press, London, Ithaca, 314 p.
- CORBET G. B. 1984. — *The Mammals of the Palaearctic Region: a Taxonomic Review. Supplement*. British Museum (Natural History), London, 45 p.
- CORSINI-FOKA M. & MASSETI M. 2008. — On the oldest known record of the Nile soft-shelled turtle, *Trionyx triunguis* (Forsk. 1775), in the Eastern Aegean Islands (Greece). *Zoology in the Middle East* 43: 108-110.
- COWAN I. M. 1972. — The status and conservation of bears (Ursidae) of the world-1970. *Proceedings of the International Conference on Bear Research and Management* 2: 343-367.
- CRAMP S. & SIMMONS K. E. L. (eds) 1980. — *Handbook of the Birds of Europe, the Middle East and North Africa. The Birds of the Western Palearctic. Vol. II*. Oxford University Press, Oxford, London, New York, 693 p.
- CUMMINS J. 1988. — *The Hound and the Hawk. The Art of Medieval Hunting*. Weidenfeld and Nicholson, London, 306 p.
- CURTIS J. 1990. — *Ancient Persia*. The British Museum Press, London, 72 p.
- DE MAIGRET A. & FOZZATI L. 1980. — *Gli Assiri. La scultura del regno di Ashurnasirpal II al regno di Assurbanipal (883-631 A.C.)*. De Luca editore, Roma, 154 p.
- EDWARDS J. 1996. — *London Zoo from Old Photographs 1852-1914*. Edward Charles, London, 241 p.
- ELLIOT D. G. 1913. — A review of the Primates. *American Museum of Natural History* 11: 147.
- EPSTEIN H. 1971. — *The Origin of Domestic Animals of Africa. Vol. II*. Africana Publishing Corporation, New York, xi + 719 p.
- EVANS H. C. & RATLIFF B. 2012. — *Byzantium and Islam: Age of Transition, 7th-9th Century*. Metropolitan Museum of Art, New York, 332 p.
- FALK T. (ed.) 1985. — *Treasures of Islam*. Artline Editions, Bristol, 400 p.
- FEDELE F. G. 2000. — L'Est: la faune du Hamrīn (Iraq). *Topoi* 2 (suppl.): 15-44.
- FERBER S. 1975. — *Islam and the Medieval West. Center for Medieval and Renaissance Studies*. State University of New York, Binghamton, 324 p.
- FITZGERALD E. (trans.) 1938. — *The Rubaiyat of Omar Khayyam*. Illustrated Editions Co., New York, 112 p.
- FOSTER P. 1969. — Lorenzo de' Medici's cascina at Poggio a Caiano. *Mitteilungen des Kunsthistorisches Institutes in Florenz* 14: 47-56.
- FOWDEN G. 2004. — *Qusayr 'Amra. Art and the Umayyad Elite in Late Antique Syria*. University of California Press, Berkeley, 390 p.
- FUNAIOLI U. 1971. — *Guida breve dei mammiferi della Somalia*. Istituto Agronomico per l'Oltremare, Firenze, 232 p.
- GASTOU F.-R. 1987. — *Sur les traces des monteurs d'ours des Pyrénées et d'ailleurs*. Loubatières, Toulouse, 190 p.
- GRABAR O. 1985. — Caratteri e problemi dell'arte islamica in Siria, in MATTHIAE P. (ed.), *Da Ebla a Damasco. Diecimila anni di archeologia in Siria*. Electa, Milano: 144-147.
- GRIMAL P. 1990. — *I giardini di Roma antica*. Garzanti Editore, Milano, 518 p.
- GROVES C. P. 2001. — *Primate Taxonomy*. Smithsonian Institution Press, Washington D C, 350 p.
- GROVES C. P. 2005. — Order Primates, in WILSON D. E. & REEDER D.-A. M. (eds), *Mammal Species of the World. A Taxonomic and Geographic Reference. Third edition, Volume 1*. The John Hopkins University Press, Baltimore: 111-184.
- GRUBB P. 2005. — Order Perissodactyla, in WILSON D. E. & REEDER D.-A. M. (eds), *Mammal Species of the World. A Taxonomic and Geographic Reference. Third edition, Volume 1*. The John Hopkins University Press, Baltimore: 629-636, 637-722.
- HALL H. R. 1928. — *Babylonian and Assyrian Sculptures in the British Museum*. Les Éditions G. van Oest, Paris, Bruxelles, 72 p.
- HALTENORH T. & DILLER H. 1977. — *Säugetiere Afrikas und Madagaskars*. BLV Verlagsgesellschaft GmbH, München, 400 p.
- HARRISON D. L. 1964. — *The Mammals of Arabia. Vol. I. Insectivora - Chiroptera - Primates*. Ernest Benn Ltd, London: ix-xi + 1-192.
- HARRISON D. L. 1968. — *The Mammals of Arabia. Vol. II. Carnivora - Artiodactyla - Hyracoidea*. Ernest Benn Ltd, London: i-vii + 193-381.
- HARRISON D. L. 1972. — *The Mammals of Arabia. Vol. III. Lagomorpha - Rodentia*. Ernest Benn Ltd, London: i-vii + 383-670.
- HARRISON D. L. & BATES P. J. J. 1991. — *The Mammals of Arabia*. Harrison Zoological Museum, Sevenoaks, 354 p.
- HAUBEN H. 1986. — "Onagres" et "hémionagres" en Transjordanie au III^e siècle avant J.-C. : à propos d'une lettre de Toubias. *Ancient Society* 15-17: 89-111.
- HERRERO MARCOS J. 2006. — *Bestiario románico en Castilla-León y Cantabria*. Cálamo, Palencia, 237 p.
- HILL W. C. O. 1970. — *Primates. Comparative Anatomy and Taxonomy. Volume 7. Cynopithecinae*. Edinburgh University Press, Edinburgh, 934 p.
- IMPELLUSO L. 2003. — *La natura e i suoi simboli*. Electa, Mondadori, Milano, 383 p.
- JAKUBIEC Z. 1993. — *Ursus arctos* Linnaeus, 1958 – Braunbär, in STUBBE M. & KRAPP F. (eds), *Handbuch der Säugetiere Europas, Vol. 5. Raubsäuger (Teil I)*. Aula-Verlag, Wiesbaden, 254-300.
- JENKINS M., KEENE M. & BATES M. 1983. — Late medieval Islamic period, in JENKINS M. (ed.), *The al-Sabah Collection. Islamic Art in the Kuwait National Museum*. Sotheby, London, 40-52.
- JOHNSGARD P. A. 1988. — *The Quails, Partridges, and Francolins of the World*. Oxford University Press, Oxford, New York, Tokyo, 264 p.
- KING A. 2002. — Mammals. Evidence from wall paintings, sculpture, mosaics, faunal remains, and ancient literary sources, in FEEMSTER JASHEMSKI W. & MEYER F. G. (eds), *The Natural History of Pompei*. Cambridge University Press, Cambridge: 401-450.
- KINGSWOOD S. C. & KUMAMOTO A. T. 1988. — Research and management of Arabian sand gazelle in the USA, in DIXON A. & JONES D. (eds), *Conservation and Biology of Desert Antelopes*. Christopher Helm, London: 212-226.
- KIRKBRIDE D. 1975. — Umm Dabaghiyah 1974: a fourth preliminary report. *Iraq* 37: 3-10.
- KUMMER H., BANAJA A. A., ABO-KHATWA A. N. & GHANDOUR A. M. 1981. — Mammals of Saudi Arabia. Primates. A survey of hamadryas baboons in Saudi Arabia. *Fauna of Saudi Arabia* 3: 441-471.
- LANCASTER HARDING G. 1959. — *The Antiquities of Jordan*. Jordan Distribution Agency, Amman, 215 p.
- LEVER C. 1987. — *Naturalized Birds of the World*. Longman Scientific and Technical, Harlow, 615 p.
- LINNAEUS C. 1758. — *Systema Naturae. Regnum Animale. A photographic Facsimile of the First Volume of the Tenth Edition (1758)*. British Museum (Natural History), London, 822 p.
- MARRISON G. E. (ed.) 1978 — *The Christian Orient*. The British Library, London, 112 p.
- MASSETI M. 1990. — Fauna of southern Jordan: notes on 22 endangered or extinct mammal and birds species. *Studi per l'Ecologia del Quaternario* 12: 133-146.
- MASSETI M. 2000. — Did the study of ethology begin in Crete 4000 years ago? *Ethology, Ecology and Evolution* 12: 89-96.
- MASSETI M. 2001. — Did endemic dwarf elephants survive on Mediterranean islands up to protohistorical times?, in CARAVETTA G., GIOIA P., MUSSI M. & PALOMBO M. R. (eds), *The World of Elephants. Proceedings of the 1st International Congress (Rome, 16-20 October 2001)*. Comune di Roma; Consiglio Nazionale

- delle Ricerche; Ministero per i Beni e le Attività Culturali; Università degli Studi di Roma “La Sapienza”, Roma: 402-406.
- MASSETI M. 2002. — *Uomini e (non solo) topi. Gli animali domestici e la fauna antropocora*. Firenze University Press; Università di Firenze, Firenze, 337 p.
- MASSETI M. 2003. — Exploitation of fauna in the Near East during ancient historical times: observations on the mammalian species represented in Assyrian art, in ALBORE LIVADIE C. & ORTOLANI F. (eds), *Climatic-Environmental Variations and Impact on Man in the Circum-Mediterranean Area during the Holocene*. Centro Universitario Europeo per i Beni Culturali, Ravello, Edipuglia, Bari: 375-390.
- MASSETI M. 2004. — Artiodactyls of Syria. *Zoology in the Middle East* 33: 139-148.
- MASSETI M. 2006. — Reflections on the Islamic Garden. *Domus* 898: 108-109.
- MASSETI M. 2009a. — In the gardens of Norman Palermo, Sicily (Twelfth Century A.D.). *Anthropozoologica* 44 (2): 7-34.
- MASSETI M. 2009b. — Carnivores of Syria. *ZooKeys* 31: 229-252.
- MASSETI M. 2012. — *Atlas of Terrestrial Mammals of the Ionian and Aegean Islands*. De Gruyter, Berlin, 302 p.
- MASSETI M. in press — A lost collection (1989-1994) of reptiles, birds and mammals of the Syrian Jazīra (Syrian Arab Republic). *Archives of Natural History*, 43 (1) (2016).
- MASSETI M. & BRUNER E. 2009. — The Primates of the western Palaearctic. A biogeographical, historical, ethnozoological and archaeozoological review. *Journal of Anthropological Sciences* 87: 33-91.
- MASSETI M. & CANTAGALLI MASSETI S. 1991. — Mattonelle da collezione. *Ca Ceramica per l'architettura* 10: 18-19.
- MATTHEWS M. & HENRY G. 1989 — *Azraq*. Royal Society for the Conservation of Nature, Amman, 64 p.
- MATTHIAE P. 1998. — *Ninive*. Electa, Milano, 217 p.
- MENDELSSHON H. & YOM-TOV Y. 1999. — *Fauna Palaestina. Mammalia of Israel*. The Israel Academy of Sciences and Humanities, Jerusalem, 440 p.
- MOUNTFORT G. 1965. — *Portrait of a Desert. The Story of an Expedition in Jordan*. Collins, London, 192 p.
- NADER I. A. 1990. — Checklist of the mammals of Arabia. *Fauna of Saudi Arabia* 11: 329-381.
- NAPIER P. H. 1981. — *Catalogue of Primates in the British Museum (Natural History) and Elsewhere in the British Isles. Part 2. Family Cercopithecidae, Subfamily Cercopithecinae*. British Museum (Natural History), London, 214 p.
- NELSON B. 1973. — *Azraq Desert Oasis*. Allen Lane, London, 436 p.
- NELSON B. 1985. — Return to Azraq. *Oryx* 19 (1): 22-25.
- NILSON G. & RASTEGAR-POUYANI N. 2013. — The occurrence of *Telescopus nigriceps* (Ahl, 1924) in western Iran, with comments on the genus *Telescopus* (Serpentes: Colubridae). *Zoology in the Middle East* 59 (2): 131-135.
- OSBORN D. J. & OSBORNOVÁ J. 1998. — *The Mammals of Ancient Egypt*. Aris & Phillips Ltd, Warminster, 213 p.
- PICCIRILLO M. (ed.) 1986. — *I mosaici della Giordania*. Edizioni Quasar, Roma, 236 p.
- PICCIRILLO M., BIKAI P. M. & DAILEY T. A. 1993. — *The Mosaics of Jordan*. American Center of Oriental Research Publications, Amman, 483 p.
- PLINY THE ELDER c. 77-79 A.D. — *Naturalis historia* VIII: 173-174
- READE J. 1983. — *Assyrian Sculpture*. British Museum Publications, London, 72 p.
- RIFAI L. B., AL-SHAFFEE D. M., AL-MELHIM W. N. & AMR Z. S. 1999. — Status of the marbled polecat, *Vormela peregusna* (Güldenstaedt, 1770), in Jordan. *Zoology in the Middle East* 17: 5-8.
- ROGERS L. J. (ed.) 2002. — *The Fire of Love. The Love Story of Layla and Majnun by Ganiavi Nizami*. Department of Languages, Literature and Media Studies, Sacred Heart University, Universe, Lincoln, 200 p.
- SCHLUMBERGER D. 1948. — Deux fresques omeyyades. *Syria, Revue d'art oriental et d'archéologie* 25: 86-102.
- SCHLUMBERGER D. & LE BERRE M. 1986. — Qasr El-Heir El-Gharbi. *Bibliothèque archéologique et historique* 120: 182-244.
- SHALEM A. 2004. — Bahram Gur woven with gold: a silk fragment in the diocesan museum of St. Afra in Augsburg and the modes of rendition of a popular theme, in HILLENBRAND R. (ed.), *Shabanama: the Visual Language of the Persian Book of Kings*. Visual Arts Research Institute, Department of Fine Arts of the University of Edinburgh; Ashgate Publishing Ltd, Hants: 117-128.
- STARCK D. & FRICK H. 1958. — Beobachtungen an aethiopischen Primaten. *Zoologische Jahrbuecher Systematik* 85: 41-70.
- STUDER J. 2001. — Les mosaïques animalières, in FIEMA Z. T., KANELLOPOULOS C., WALISZEWSKI T. & SCHICK R. (eds), *The Petra Church*. American Center of Oriental Research, Amman: 271-293.
- SULEIMANOVA F. (ed.) 1985. — *Miniatures Illuminations of Nisami's "Hamsab"*. Uzbek Academy of Science, Kh. S. Suleimanov Institute of Manuscripts, Tashkent, 334 p. [in Uzbek, English, Persian and Russian].
- TCHERNOV E. 1979. — Quaternary fauna, in HOROWITZ A. (ed.), *The Quaternary of Israel*. Academic Press, London, New York: 259-365.
- TALBOT L. M. A. 1960. — A look at threatened species. A report on some animals of the Middle East and southern Asia which are threatened with extermination. *Oryx* 5: 153.
- THOMAS O. 1900. — On the mammals obtained in south-western Arabia by Messrs. Percival and Dodson. *Proceedings of the Zoological Society of London* 7: 95-97.
- TOYNBEE J. M. C. 1973. — *Animals in Roman Life and Art*. Thames & Hudson, London, 431 p.
- UERPMMANN H. P. 1981. — The major faunal areas of the Middle East during the Late Pleistocene and the Early Holocene, in CAUVIN J. & SANLAVILLE P. (eds), *Préhistoire du Levant*. Centre national de la Recherche scientifique, Paris: 99-105.
- UERPMMANN H. P. 1987. — *The Ancient Distribution of Ungulate in the Middle East*. Beihefte zum Tübinger Atlas des vorderen Orients 27: 13-171.
- UGURTAS I. H., PAPENFUSS T. J. & ORLOV N. L. 2001. — New record of *Walterinnesia aegyptia* Lataste, 1887 (Ophidia, Elapidae, Bungarinae) in Turkey. *Russian Journal of Herpetology* 8: 239-245
- VIBERT-GUIGUE C. & BISHEH G. 2007. — *Les peintures de Qusayr'Amra. Un bain omeyyade dans la bâdiya jordanienne*. Bibliothèque archéologique et historique, Institut français du Proche-Orient, Beyrouth, 228 p.
- YALDEN D. W., LARGEN M. J., KOCK D. & HILLMAN J. C. 1996. — Catalogue of the mammals of Ethiopia and Eritrea. 7. Revised checklist, zoogeography and conservation. *Tropical Zoology* 1 (9): 73-164.
- ZANNIER I. (ed.) 1999. — *L'Egitto del Gran Tour nella fotografia degli Zangaki*. Federico Motta Editore, Milano, 59 p.

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