



**HAL**  
open science

# Newcomers in the Bestiary. A Review of the Presence of *Lycaon pictus* in Late Predynastic and Early Dynastic Environment and Iconography

Axelle Brémont

► **To cite this version:**

Axelle Brémont. Newcomers in the Bestiary. A Review of the Presence of *Lycaon pictus* in Late Predynastic and Early Dynastic Environment and Iconography. *The Ancient Egyptians and the Natural World. Flora, Fauna, and Science*, 2021. hal-03409520

**HAL Id: hal-03409520**

**<https://hal.science/hal-03409520v1>**

Submitted on 3 Nov 2021

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

## **Newcomers in the Bestiary. A review of the presence of *Lycaon pictus* in Late Predynastic and Early Dynastic environment and iconography**

Axelle Brémont, Sorbonne University & CNRS UMR 8167 “Orient et Méditerranée”. 1 rue Victor Cousin, 75005 Paris, France. [axelle.bremont@paris-sorbonne.fr](mailto:axelle.bremont@paris-sorbonne.fr)

*Abstract: Because it is unmistakably represented on several palettes from the late Predynastic – early Protodynastic period, it has been assumed that the African wild dog (*Lycaon pictus*) was present in Egypt at least during the Middle Holocene. However, no osteological evidence, either from anthropic or geological assemblages, supports its presence anywhere in the Egyptian territory. Instead, confrontation with the rest of the depicted bestiary from this period shows many evidence of animals which were represented despite not being indigenous to Egypt (or at least not anymore), such as fallow deer, baboon or elephant. A reexamination of iconographic details and the associated complete lack of faunal remains suggests the lycaon was represented because it was valued as an exotic animal, rather than as a part of the Egyptian biotope.*

*Keywords: Predynastic, iconography, zooarchaeology, African wild dog, exoticism*

### ***Introduction: weighing the « biocénose » against the « iconocénose »***

One of the best instances of possible collaboration between bioarchaeologists and “traditional” Egyptologists is the comparison between the three spheres of animal presence defined by Djindjian (2012). What this author calls zoocénose, but would usually (and perhaps best) be called biocénose, entails the whole fauna dwelling in a given environment at a given time. The taphocénose is in turn restricted to those taxa purposefully exploited by humans. And what he coins iconocénose is another type of selection operated by man into the available “pool” of animal species: the ones that are depicted in graphic manifestations.

In order to allow for meaningful comparisons and avoid any kind of misinterpretation, it is necessary to assert biocénose through geological records rather than faunal remains recovered from human sites, whenever they are available, so as not to blur the distinction with the taphocénose. Another necessary guideline is not to discard presumed intrusive remains from publication – as has sometimes been done in the past or in very short records – as those, especially when penecontemporaneous to the studied assemblage, also yield information on taxa present in the vicinity. Finally, it is essential to refrain from using iconographic occurrences as a way of proving the existence of a specific species in the regional biocénose.

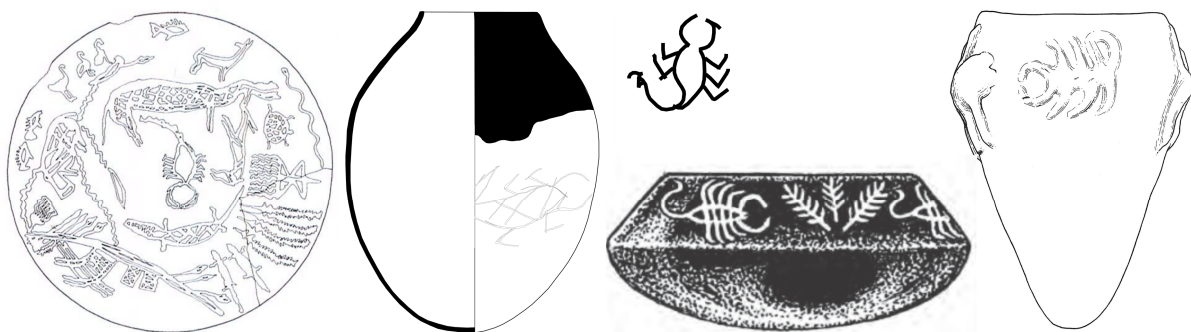
This tendency, especially common in past Egyptological studies, of making insufficient use of rigorous zooarchaeological data, can occasion misjudgments and especially mistake social and cultural changes for an undistorted reflection of biological or climatic evolution. Before zooarchaeological studies began to increasingly be conducted on Egyptian sites in the 1980s and 1990s, Egyptologists commonly assumed, from a handful of doubtful depictions, that the aardvark or the wild boar could be encountered in Ancient Egypt (e.g. Keimer, 1937; 1944). This is especially of concern regarding the Predynastic period, as a number of forgeries and suspect artifacts have been ascribed to this period on the sole basis of crudeness of depiction and lack of conformity to Dynastic canon.

On the contrary, what is precisely of interest to a cultural history of animals is the fact that biocénose, taphocénose and zoocénose never quite perfectly overlap, a phenomenon that François Djindjian has underlined for Paleolithic European societies: “why do they keep on representing bison and horses when they only eat reindeer?” (Djindjian, 2012: 313, my translation). Indeed, if we focus on what is known to us from the archaeological record, it appears that not all species known to the Egyptians are present in their iconographic bestiaries; perhaps more surprisingly, the reverse is also true, as not all species depicted in art seem to have actually dwelled in fourth-millennium Egypt.

***Newcomers in the bestiary: Those which have always been around...***

Around the Naqada IIC period, a clear shift is perceptible towards what one might call a novel “Early Dynastic bestiary”, with many new species suddenly becoming the subject of representation while they had not previously attracted much or even any attention in iconography, while others, such as donkeys or dogs, progressively fade from the scene.

Among such “newcomers” is the scorpion, of which only a handful of depictions are securely dated to before Naqada IIC<sup>1</sup>, although its continued presence in fourth-millennium Egypt can hardly be doubted (even if they are puzzlingly rendered with a very inconsistent number of legs). After this point, however, scorpions suddenly multiply (Hendrickx 1998) and especially, of course, during the Naqada III period, in relation to the so-called “king(s) Scorpion” from Abydos and Hierakonpolis.



*Figure 1. Scorpion depictions pre-dating Naqada IIC*

*a. C-Ware bowl, Abydos t. U-264, Naqada IC-IIA (Cairo Museum CG2076). After (Hartmann, 2008)*

*b. Graffito on B-Ware ovoid jar, Dakka cem. 103, Naqada IIA-IIB (Boston MFA 19.1555). Drawing by the author*

*c. Graffito on pottery, Naqada t. 472 (current location lost), Naqada IIA-IIB. After (Petrie, 1896: LI.36)*

*d. Modeled vase, Naqada t. 1787, Naqada IIA (Ashmolean Museum 1895.233). After (Payne, 2000: fig. 32.604)*

*e. C-Ware carinated bowl, Petrie Museum UC 15326 (unprovenanced). After (Graff, 2009:cat.no. 128)*

<sup>1</sup> Petrie Museum UC 15326 could date to Naqada I considering the chronological range of carinated vases C04.3Ba according to Hartmann (2016); Boston MFA 19.1555 is typologically dated to Naqada IIA – IIB according to the same author; Ashmolean Museum 1895.323 from Naqada t. 1787 is dated by Hendrickx (1989) to Naqada IIA

A similar case could be made for frogs, whose geographical and ecological distribution has obviously not varied in ancient times, but which only enter the depicted bestiary around the last stages of Naqada culture.

### ***... and those which never have been***

Another, very contrasted case, is provided by baboon depictions. Whereas the bulk of their representations does not occur prior to the 6<sup>th</sup> dynasty (and probably that is the case of a lot of those enclosed in “early temples” votive assemblages (Bussmann, 2010)), a few depictions are attested at least as early as Naqada IIIA1, including a minute bead from Tarkhan (t. 1552)<sup>2</sup>, and evidence in writing at least from the later 1<sup>st</sup> dynasty, especially with several ivory labels one of them dating from the reign of Semerkhet.

However, while baboons appear on this material as well as many faience figurines from the late Old Kingdom and several 4<sup>th</sup> to 6<sup>th</sup> dynasty reliefs (listed in (Vandier d’Abbadie, 1964)), their material remains have never been found in contexts this old, be it in man-made or geological assemblages, apart from one very specific instance in Hierakonpolis which we shall mention in detail later. This lack of osteological remains is puzzling especially for settlements, as primate bones are very distinctive and one could expect them to sometimes venture near human settlements in search for food, especially since they would have dwelt near the river (Lesur, pers. comm.).

Indeed, primates in the New Kingdom are definitely imported, and it appears to be the case already from earlier periods on, as monkeys also feature amongst the Puntite products brought back by Sahure (El-Awady, 2009: pl. 5). In the Old Kingdom reliefs we mentioned supra, baboons never appear in a natural setting but exclusively in anthropic contexts and as tamed animals, as opposed to species depicted to characterize a biotope in the traditional “fowling in the marshes” and “hunting in the desert” scenes. Vandier d’Abbadie (1964) already took for granted the fact that baboons had never been native to the Egyptian Nile Valley and would exclusively have been imported from further south.

This opinion is supported by the only primate remains recovered so far from early contexts: the *Papio anubis* baboons (as well as green monkeys) burials from the Hierakonpolis elite – some even say royal – cemetery HK6, dating to Naqada IC-IIA. Van Neer et al. (2017: 397) strongly suggest that these would have been imported from further south, meaning that they could not be found even as far south as Hierakonpolis, much like the two young African elephants buried at the same site. Indeed, many of the species attested in the cemetery, if not completely exotic, were probably rarely encountered by the inhabitants of the valley, since they were either only found on the margins, such as the leopard, or had already dramatically decreased in population at that time, such as the hartebeest (Lesur, 2013: 44; Van Neer et al., 2004: 111).

### ***Was *Lycaon pictus* present in Egypt in Predynastic times?***

The two case studies developed above should serve as a theoretical framework for studying the disparities between biocénose and iconocénose. Let us now look into a third such “newcomer in the bestiary”: the species of canids which appears exclusively on seven large

---

<sup>2</sup> Two statuettes bearing the names of 1<sup>st</sup> dynasty royalty (Berlin ÄM 22607 and another one inscribed with the name of Merneith from a private collection (Wiese 2001: 35), are unfortunately without known provenance and it is unsure whether they do date to the Early dynastic period (Patch et al. 2011: 236, note 70)



Early Dynastic slate palettes (complete list in Hendrickx, 2006: 740), the most famous of them being that from the Hierakonpolis temple “Main Deposit” (Ashmolean Museum E3924). It has been first proposed by Henry Fischer (1958), following a suggestion by Anthony Arkell, that this animal was an African wild dog (*Lycaon pictus*), a wild canid with spotted pelt now restricted, since the 19<sup>th</sup> century, at least to the Sudanese savannah belt (Manlius, 1996:108, quoting Murray, 1866), if not to the extreme southern fringe of the Sahara (D’Huy & Le Quellec, 2009: 89).

This identification has created a general consensus in subsequent literature, including discussions by Krzysztof Cialowicz (1991), John Baines (1993) and Stan Hendrickx (2006). Indeed, the characteristic large, rounded ears speak in its favor and exclude the possibility that this might be another wild canid such as jackal or hyena. The bushy tail is consistent with this identification as well, though it could pertain to other animals as well (see *infra*). These representations thus generally conform to the anatomy of the animal, so much so that it has been assumed from there that the lycaon was familiar to the Egyptians, and that it could be encountered at least up until the Thinite period in the semi-desertic margins of the Valley. Some authors have even suggested it might have been used as a hunting auxiliary alongside the tsm sighthound (e.g. Baines, 1993; Bodenheimer, 1960; Boessneck, 1988; Hendrickx, 2006; Keller, 1909; Osborn & Osbornova, 1998).

However, despite quite undisputable iconographic evidence, some doubt can be cast on the actual presence of lycaons in Egypt through the Early Dynastic period, especially as this animal is completely absent from every zooarchaeological record throughout the Egyptian territory. This entails even purely geological ones as studied from the Western Desert (Peters & Pöllath, 2004; Pöllath, 2009). Of course, the animal’s distribution could have varied according to climate modifications, but it might be useful to note that this species is actually less sensitive to aridification than other savannah animals such as elephant or giraffe: “ses besoins en eau étant très réduits, il peut même atteindre des zones désertiques” (Lopez, 1995: 11). Had it ever been present in Egypt in the fourth millennium, there would therefore have been no reason for it to disappear in the subsequent periods. There is nonetheless no trace of this animal ever appearing in faunal remains or iconography in the Old Kingdom, except for a few misidentified specimens now rather considered hyenas (Lopez, 1995: 11, *contra* Keller, 1909).

Despite Gautier (1993: 262-264) considering the lycaon’s absence from human-made assemblages consistent with its not being consumed, many carnivores are usually attested on Predynastic settlements and middens, especially hyenas and jackals, as they come to scavenge on human leftovers or are killed when roaming around settlements. *Hyaena hyaena* was spotted in the Naqada/El-Khattara area as well as in Lower Egypt while *Canis aureus* is attested in the Maadi remains. At Hierakonpolis HK29A, where the ratio of carnivores is abnormally high and varied compared to other sites (including e.g. *Vulpes zerda*, *Vulpes rueppelli*...), the lycaon is nowhere mentioned (Linseele et al., 2009:124-125). This is all the more surprising that the authors suppose the many bones of carnivores bearing cut marks may be proof of skinning and pelt-processing rather than consumption as food, and one would indeed expect the lycaon to be especially sought after in this context.

While possible confusions with other canids might partially account for such a lack (Steder 2013: 45), the African wild dog has indeed been spotted at other sites: it is especially listed as “rare”, but nevertheless present, in Neolithic contexts from Wadi Shaw (nowadays northern Sudan) (Van Neer & Uerpmann 1989: tab. 3). It is however not recorded at Wadi Halfa for

the Late Paleolithic period (Gautier & Van Neer, 1989: tab. 6.19). Only a modern comparison specimen in the British Museum would reportedly come from Gebel Elba in the southeastern corner of Egypt (Setzer, 1956), but in any case even if this provenance was confirmed, the area is known to be a “biological hotspot” which may have been home to residual populations. Conversely, one isolated mention of lycaons in the Kharga area at the end of the 19<sup>th</sup> century has convincingly been demonstrated by Manlius (1996) to be, most probably, a misidentification of hyenas.

Of course, some taxa which were, and still are, definitely present in Egypt in ancient times, such as ostriches, Nubian asses or ibexes, have never or hardly ever been detected in man-made bone assemblages, but it should be emphasized that they do occur in geological zoological records, especially the well-studied ones in the Western Desert.

### ***Encounter in the flesh, encounter through picture***

Moreover, compared to these other species which hold countless iconographic occurrences, the clues for a possible presence of *Lycaon pictus* in Predynastic Egypt are limited to a handful of attestations in the iconography of the later phases. Some have suggested that it might have been represented earlier on, but the Petrie Museum C-Ware UC 15332 is best qualified as hyena (Ikram, 2001; Navajas, 2005) while another previously cited example, on the Hierakonpolis ivory plaque held in the Petrie Museum (UC 14864) should most probably be re-identified as a leopard, as is obvious from the pattern of the spotted hide and the length and slenderness of the curvy tail.



Figure 2. Figures of earlier date previously proposed to represent *Lycaon pictus*  
 a. C-Ware necked bottle, unknown provenance (Petrie Museum UC 15332)  
 b. Ivory plaque (inlay?), Hierakonpolis Main Deposit (Petrie Museum UC 14864)

Stan Hendrickx has suggested that animal tails hung to the belt of human figures on the “Hunters’ Palette” and on some earlier material such as the painted vase Abydos t. U-239 (Dreyer et al., 1998: Abb. 12) or the Was-Ha-Waset rock art panel WHW86 (Darnell, 2009: 88) should be considered lycaon tails (Hendrickx, 2006: 739-742; Hendrickx, 2013: 252). One could however argue that they might as well be hyena or jackal tails, which are similarly bushy. Depictions as schematic as the ones occurring on C-Ware could even represent the tails of basically any furry animal. In any case, those depictions could not be considered compelling proof of the presence of this animal in Egypt, as lycaon skins could very well have been imported from further south<sup>3</sup>.

<sup>3</sup> Wim van Neer (pers.comm.) emits a similar hypothesis for a single giraffe phalanx found at Adaima

It is therefore safe to state that the occurrence of African wild dogs are restricted to these seven decorated palettes. They occur in an extremely similar pose and morphology and these artifacts may indeed even have been copied from each other or from a common model. The Brussels fragment in particular (MRAH E6196) is completely identical to the ones on the small Hierakonpolis palette, while the ears of the smaller individuals treated in relief in the center of the same palette are depicted in a stylized manner identical with the Metropolitan Museum fragment (MET 28.9.8) and the “Michailidis palette”.



Figure 3a. Comparison of the treatment of *Lycaon pictus* on the Hierakonpolis palette (left) and on the Brussels fragment MRAH E6196 (right)



Figure 3b. Comparison of the treatment of the ears of *Lycaon pictus* on the Hierakonpolis palette (left), the MET fragment 28.9.8 (center) and the “Michailidis palette” (right)

Furthermore, Henry Fischer (1958: 81) already noticed that all lycaons on the Hierakonpolis palette consistently display five toes on their hind paws, like most other, probably more familiar canids (*Canis familiaris*, *Canis aureus*, *Vulpes vulpes*...), whereas African wild dogs actually have four, both on hind and forelegs. The Michailidis palette even presents only three. Moreover, “it is true that one of the most striking features that allies *Lycaon* to the hyenas, the absence of a dewclaw on the forefoot, is not consistently observed on the palettes, assuming that this extra digit would be represented like the others” (*ibid.*).



Figure 4. Hierakonpolis palette, details of all hind legs of *Lycaon pictus* (recto and verso)

All these arguments would seem to indicate that Predynastic artists actually only had limited familiarity with African wild dogs. This situation is reminiscent of that of other species that seem to have attracted specific attention in Late Predynastic times, although completely exogenous to Egypt. This is for example the case for fallow deers, which unmistakably and indisputably appear on several media from the Naqada IIC period onwards (Coptos colossus “Coptos 1”, Ashmolean Museum 1894.105d; Sayala mace handle, Cairo Museum, now lost; “Hunters’ Palette” British Museum E20790). After reviewing all available evidence, Chiori Kitagawa (2008) concluded that deer had never been indigenous to Egypt, despite being occasionally represented on a handful of artifacts throughout the Predynastic and Dynastic period. The conclusion was supported by the complete absence of cervid bones in any archaeological assemblage, man-made and geological alike. In this particular case, borrowings from Mesopotamian iconography are the most likely reason to explain the few cases of deer depictions, as happens at the very same period with the serpopard motif and several other mythical animals first appearing on Urukian material.

### *An early taste for exotic wonders*

How should we then interpret these scarce African wild dog depictions? Are they fading memories of what the Egyptian fauna looked like before the desert dried up again, just like the elephant pictures which linger on until they become less and less recognizable for almost a millennium after the animal actually disappeared from Egypt (Schott, 1971; Brémont, in works)? Or are they rather demonstrations of an early taste for exotic species, as we know for a fact was very significant in other periods of Egyptian history, from Sahure’s Punt expedition in the 5<sup>th</sup> dynasty to the so-called “Botanical Garden” of Thoutmosis III in Karnak (Beaux 1990) to the countless scenes of foreign “tributes”?

One particularly interesting example for our purpose is the hunting scene from Ukhhotep’s tomb in Meir (t. B2). Several species are there depicted set apart from the hunting scene itself; their layout conveys the impression of a descriptive catalogue rather than a narrative rendering, as opposed to the gazelles and hare on the left part, which are engaged in action, assaulted by dogs and shot by arrows.

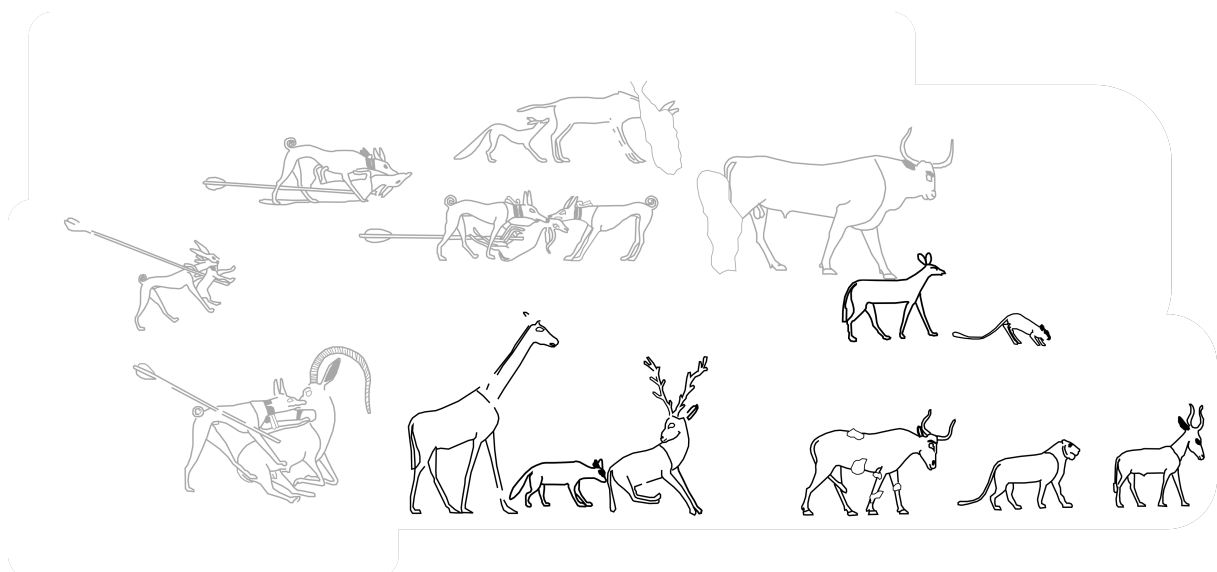


Figure 5. Meir, Tomb of Ukhhotep (t. B2), south wall, central and eastern parts (detail) (after Blackman, 1915: pl. VII-VIII)

Among these species, we find the fallow deer and baboon once again, as well as a lion, a giraffe and a probable lycaon (although its ears are somewhat less rounded than expected). All of these are definitely exotic in Egypt at that time, and indeed it looks almost as if the artist, or the tomb owner, was really keen on having them represented in the tomb, yet also decided to acknowledge the fact that he had actually never been able to hunt them himself by spatially dissociating them from the actual hunting scene. The precise rendering of the animals' morphological characteristics should not surprise us, considering examples of perfectly naturalistically depicted species that are far from indigenous to Egypt, such as the Deir el-Bahari secretary bird (Taterka, 2019).

From this detour by Middle and New Kingdom iconography, it becomes clearer than ever that animals which are never encountered as such in the biocénose may well be the subject of detailed naturalistic representation, be it because some individuals are occasionally imported from other regions or because people in Egypt were familiar with their image rather than with the animal itself. In both cases, interest in depicting them is triggered by their exotic feel. In this, the sudden and brief appearance of the African wild dog in the Protodynastic bestiary is best compared with the situation of the baboon as developed supra rather than with that of the scorpion or the frog.

### ***Conclusion: An exotic bestiary for the Naqada IIC – IIIA period***

The lycaon and baboon are not alone in this situation. Apart from the Near Eastern fallow deer already discussed, it might be worth noting that the only records of lions previously mentioned for the Egyptian Predynastic period have recently been re-identified as probable leopards (Van Neer 2013: 298).

As to the storks which make an appearance in the iconography in the same period, they have been positively identified to depict saddle-billed storks, due to the large, characteristic caruncle on the beak of all known detailed examples (e.g. Davis comb handle, Metropolitan Museum inv.no. 30.8.224). As the other species mentioned in this article, their distribution is now restricted to the southern half of Sudan. Janak (2011:149) reports that “the best (...) depictions of the saddle-billed stork come from the earliest periods of Egyptian history. During the second phase of the Old Kingdom, the sign became schematized with (...) inaccuracies (sharp but short bill, shorter neck, shorter legs, different posture, black wattle, white head etc.)”. If it had lived in Egypt before, it had decidedly regressed south at this period (Houlihan, 1986:25). While storks have been reported from many Predynastic sites, the saddle-billed stork is never evoked; it should however be more easily distinguishable as the tallest in this category of birds.

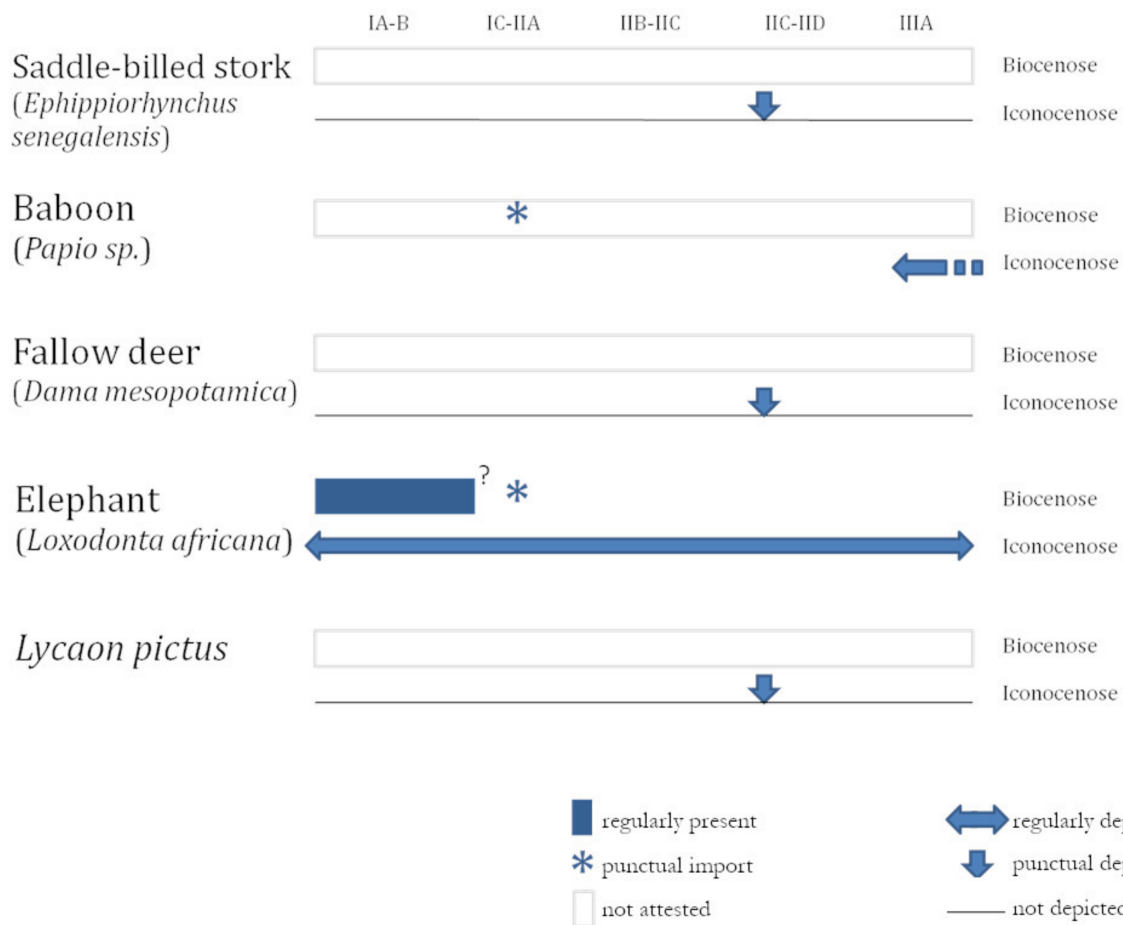


Figure 6. Summary of available osteological and iconographic evidence for the above-mentioned species throughout the Predynastic period

If we sum up all of the evidence, most of these “newcomers in the bestiary” at the dawn of the Early Dynastic period seem to be species of foreign origin, mostly African fauna, some of them Near Eastern.

Although an absence of proof is not to be taken as a proof of absence, not one of these species appearing in the late Predynastic bestiary has ever been spotted in zooarchaeological records, be they geological or man-made. Even according to the most optimistic recent estimations (Peters & Pöllath, 2004: 43; Kuper & Kröpelin, 2006; Marriner et al., 2012), the Sahelian savannah belt could not have gone up more than 800 km, which barely takes it to the current latitude of Edfu. This is also corroborated by the fact that even as far south as in Hierakonpolis, elephants or baboons apparently had to be acquired from distant locations (Van Neer, 2004: 111-112).

The fact that those species enter the Naqada bestiary at the very end of the period rather than early on would seem to confirm that they are not the memory of a “ghost” fauna that was present when the Egyptian climate was still more humid and savannah-like – but rather a clue as to Egyptian interest into exotic species imported from further south.

We know that the spreading of Naqadan material culture both north- and southward is increasingly important starting from Naqada IIB onward and especially so for the Naqada IID – IIIA period. This would seem to agree with a possible exposure of Upper and Middle



Egyptian populations to more exotic faunas, owing to more sustained contacts with regions further north and further south. This is true of plant remains as well: the first interest in acclimatizing vine crops is dated to the turn of the Naqada IIIA – IIIB period (Dreyer et al. 1996: 49-57; McGovern & Hartung, 1997: 10; Serpico & White 1996; Tallet 1998: 13), while endeavors to transplant the date palm, originally indigenous to the Nile Valley, may have started at the same period (Farout 2018, Tallet in works).

The spreading of borrowed fantastic animal motifs at the exact same period may confirm this idea, and indeed Egyptian image makers may very well have considered serpopards or griffins actual animals indigenous to the Mesopotamian environment – how would they know, if the proof of their existence was only conveyed to them by images?

All species are represented on media more codified and standardized than prior iconography, which appear to have been copied from one occurrence to the other rather than individual, original creations. The study of the permanence of elephant depictions, as well as of other similar cases in other areas (e.g. giraffes in China (Liscomb, 2016)) seems to confirm that the memory of rare animals' morphology may persist for centuries without major deformations if contact with ancient images is maintained.

In any case, it is only thanks to continued interaction between bioarchaeological and historical approaches that we will be able to assert the exact extent of the Egyptian “biocénose” and its relationship to what human societies selected from it as worth eating and as worth representing.

### ***Acknowledgements***

I am strongly indebted to Joséphine Lesur for her help and thorough reading on early drafts of this paper. Any remaining mistake or misinterpretation of zooarchaeological data is my own.

### ***References***

- el-Awady, T. 2009. Abusir XVI. Sahure – The Pyramid causeway. History and decoration program in the Old Kingdom. – Prague, Czech Institute of Egyptology.
- Baines, J. 1993. Symbolic roles of canine figures on early monuments. – *Archéo-Nil* 3: 57-74.
- Beaux, N. 1990. Le cabinet de curiosités de Thoutmosis III - Plantes et animaux du Jardin botanique de Karnak. – Leuven, Peeters.
- Blackman, A.M. 1915. The Rock Tombs of Meir. Part II. The tomb-chapel of Senbi's son Ukh-Hotp (B, No. 2). – London, Egypt Exploration Fund.
- Bodenheimer, F.S. 1960. *Animal and Man in Bible Lands*. – Leiden, Brill.
- Boessneck, J. 1988. *Die Tierwelt des Alten Ägypten : untersucht anhand kulturgeschichtlicher und zoologischer Quellen*. – Munich, C.H. Beck.
- Brémont, A. in works. Un éléphant, ça trompe énormément... Animal fantastique ou perte de référent de *Loxodonta africana* en Egypte au pré- et protodynastique (IVe-IIIe millénaires). In: Man-Estier, E., Sepulveda, M., Robert, E., Paillet, P., Mélard, N. Eds. *Caractérisation, continuités et discontinuités des manifestations graphiques des sociétés préhistoriques. Actes du XVIIIe congrès international de l'UISPP*. – Paris, UISPP Proceedings Series.



- Bussmann, R. 2010. Die Provinztempel Ägyptens von der 0. bis zur 11. Dynastie. Archäologie und Geschichte einer gesellschaftlichen Institution zwischen Residenz und Provinz. – Leiden & Boston, Brill.
- Cialowicz, K. 1991. Les palettes égyptiennes aux motifs zoomorphes et sans décoration : Etudes de l'art prédynastique. – Krakow, Uniwersytet Jagiellonski.
- Darnell, J.C. 2009. Iconographic attraction, iconographic syntax and the tableaux of royal ritual power in the Pre- and Proto-Dynastic rock inscriptions of the Theban Western Desert. – *Archéo-Nil* 19: 83-107.
- Djindjian, F. 2012. Fonctions, significations et symbolismes des représentations animalières paléolithiques. In: Clottes, J. Ed. *L'art pléistocène dans le monde. Actes du congrès IFRAO, Tarascon-sur-Ariège, septembre 2010.* – Tarascon-sur-Ariège, Société préhistorique Ariège-Pyrénées: 312-320.
- Dreyer, G., Engel, E.V., Köhler, E.C., Hartung, U., Hikade, T. & Pumpenmeier, F. 1996. Umm el-Qaab. 7./8. Vorbericht – Mitteilungen des Deutschen Instituts für Ägyptische Altertumskunde in Kairo 52: 49-57.
- Dreyer, G., Köhler, E.C., Hartung, U., Hikade, T., Pumpenmeier, F. & Müller, V. 1998. Umm el Qaab. Nachuntersuchungen im frühzeitlichen Königsfriedhof. 9./10. Vorbericht. – Mitteilungen des Deutschen Instituts für Ägyptische Altertumskunde in Kairo 54: 77-167.
- Farout, D. 2018. La tête de massue du roi Scorpion : un géant sylviculteur ? – *Egypte, Afrique & Orient* 89: 31-40.
- Fischer, H. 1958. A Fragment of Late Predynastic Egyptian Relief from the Eastern Delta. – *Artibus Asiae* 21: 64-88.
- Gautier, A. 1993. The Middle Palaeolithic Archaeofaunas from Bir Tarfawi (Western Desert, Egypt). In: Wendorf, F., Schild, R. & Close, A.E. *Egypt during the last Interglacial. The Middle Palaeolithic at Bi'r Tarfawi and Bi'r Sahara East.* – New York, Springer US: 121-143.
- Gautier, A. & Van Neer, W. 1989. Animal remains from the Late Palaeolithic sequence at Wadi Kubbania. In: Wendorf, F. & Schild, R. *The Prehistory of Wadi Kubbania. Vol. 2. Stratigraphy, Palaeoeconomy, and environment.* – Dallas, Southern Methodist University Press: 130-162.
- Graff, G. 2009. Les peintures sur vases de Nagada I - Nagada II. Nouvelle approche sémiologique de l'iconographie prédynastique. – Leuven, Leuven University Press.
- Hartmann, R. 2008. Zwei Fragmente der White Cross-lined Ware aus dem Friedhof U in Abydos zu Gefäßen aus dem ägyptischen Museum Kairo. In: Engel, E.M., Müller, V. & Hartung, U. Eds. *Zeichen aus dem Sand. Streiflichter aus Ägyptens Geschichte zu Ehren von Günter Dreyer.* – Wiesbaden, Harrassowitz Verlag: 163-182.
- Hartmann, R. 2016. Umm el-Qaab IV. Die Keramik der älteren und mittleren Naqadakultur aus dem prädynastischen Friedhof U in Abydos (Umm el-Qaab). – Wiesbaden, Harrassowitz Verlag.
- Hendrickx, S. 1989. De Grafvelden der Naqada-cultuur in Zuid-Egypte, met bijzondere aandacht voor het Naqada III Grafveld te Elkab. *Interne chronologie en sociale differentiatie.*

Vol. II. Tabellen en bibliografie. – Unpublished PhD thesis. Leuven, Katholieke Universiteit Leuven.

Hendrickx, S. 1998. Peaux d'animaux comme symboles prédynastiques. A propos de quelques représentations sur les vases White Cross-lined. – *Chronique d'Égypte* 73, 146: 203-230.

Hendrickx, S. 2006. The dog, the Lycaon pictus and order over chaos in Predynastic Egypt. In: Kroeper, K., Chłodnicki, M. & Kobusiewicz, M. Eds. *Archaeology of Early Northeastern Africa. In memory of Lech Krzyżaniak*. – Poznan, Poznan Archaeological Museum: 724-746.

d'Huy, J. & Le Quellec, J.L. 2009. Du Sahara au Nil : la faible représentation d'animaux dangereux dans l'art rupestre du désert Libyque pourrait être liée à la crainte de leur animation. – *Cahiers de l'Association des Amis de l'Art Rupestre Saharien* 13: 85-98.

Hendrickx, S. 2013. Hunting and social complexity in Predynastic Egypt. – *Académie Royale des Sciences d'Outre-mer, Bulletin des Séances* 57, 2-4: 237-263.

Houlihan, P.F. 1986. *The birds of Ancient Egypt*. – Warminster, Aris & Phillips.

Ikram, S. 2001. The Iconography of the Hyena in Ancient Egypt. - *Mitteilungen des Deutschen Instituts für Ägyptische Altertumskunde in Kairo* 57: 127-140.

Janak, J. 2011. A question of size. A remark on early attestations of the ba Hieroglyph. - *Studien zur Altägyptischen Kultur* 40: 143-153.

Keimer, L. 1937. Remarques sur le porc et le sanglier dans l'Égypte ancienne. – *Bulletin de l'Institut d'Égypte* 19: 147-156.

Keimer, L. 1944. L'oryctérope dans l'Égypte ancienne. In: Keimer, L. *Zoologica I-III*. – Le Caire, Imprimerie de l'Institut Français d'Archéologie Orientale: 1-20.

Keller, O. 1909. *Die antike Tierwelt*. – Leipzig, W. Engelmann.

Kitagawa, C. 2008. The status of fallow deer in Ancient Egypt: autochthonous or introduced? In: Vila, E., Gourichon, L., Choyke, A.M. & Buitenhuis, H. Eds. *Archaeozoology of the Near East VIII*. – Lyon, Publications de la Maison de l'Orient et de la Méditerranée: 541-552.

Serpico, M. & White, R. 1996. A Report on the Analysis of the Contents of a Cache of Jars from the Tomb of Djer. In: Spencer, A. Ed. *Aspects of Early Egypt*. – London, British Museum Press: 128-139.

Kuper, R. & Kröpelin, S. 2006. Climate-controlled Holocene occupation in the Sahara: Motor of Africa's evolution. – *Science, New Series* 313, 5788: 803-807.

Lesur, J. 2013. Des animaux et des hommes en Égypte au Néolithique et Prédynastique. – *Archéo-Nil* 23 : 33-54

Linseele, V., Van Neer, W. & Friedman, R. 2009. Special Animals from a Special Place? The fauna from HK29A at Predynastic Hierakonpolis. – *Journal of the American Research Center in Egypt* 45: 105-136.

Liscomb, K. 2016. How the giraffe became a qilin: intercultural signification in Ming Dynasty arts. In: Silbergeld, J. & Wang, E.Y. Eds. *The zoomorphic imagination in Chinese art and culture*. – Honolulu, University of Hawai Press: 341-378.

- Lopez, A. 1995. Le Lycaon (*Lycaon Pictus*: Mammifères, Canidae) dans l'ancienne Egypte. – Nilus 4: 10-14.
- Manlius, N. 1996. Le Lycaon présent en Egypte au XIXème siècle ?. – Bulletin de la société linnéenne de Bordeaux 24, 2: 107-109.
- Marriner, N., Flaux, C., Kaniewski, D. & Morhange C. 2012. ITCZ and ENSO-like pacing of Nile delta hydro-geomorphology during the Holocene – Quaternary Science Reviews 45: 73-84.
- McGovern, P.E., Hartung, U., Badler, V.R., Glusker, D.L. & Exner, L.J. 1997. The Beginnings of Winemaking and Viticulture in the Ancient Near East and Egypt. – Expedition 39, 1: 3-21.
- Murray, M. 1866. The Geographical Distribution of Mammals. – London, Day & sons.
- Navajas Jiménez, A.I. 2005. The Petrie museum's beaker UC15332 or the first representation of a *Hyaena hyaena* in Egypt. – Göttinger Miszellen 206: 69-77.
- Osborn, D. & Osbornova, J. 1998. The Mammals of Ancient Egypt. – Warminster, Aris & Phillips.
- Patch, D.C. 2011. Dawn of Egyptian Art. – New Haven, Yale University Press.
- Payne, J.C. 2000. Catalogue of the Predynastic Egyptian collection in the Ashmolean Museum – Leuven, Peeters.
- Peters, P. & Pöllath, N. 2004. Holocene faunas of the Eastern Sahara: Zoogeographical and Palaeoecological Aspects. In: Lauwerier, R. & Plug, I. The future from the past. Archaeozoology in wildlife conservation and heritage management. – Oxford, Oxbow Books: 34-50.
- Pöllath, N. 2009. The Prehistoric gamebag: the archaeozoological record from sites in the Western Desert of Egypt. In: Riemer, H., Förster, F., Herb, M. & Pöllath, N. Eds. Desert Animals in the Eastern Sahara: Status, Economic Significance, and Cultural Reflection in Antiquity ; Proceedings of an Interdisciplinary ACACIA Workshop Held at the University of Cologne, December 14-15, 2007. – Cologne, Heinrich-Barth-Institut: 309-340.
- Schott, E. 1971. Ein Stempelsiegel in Form eines Elefanten. – Mitteilungen des Deutschen Instituts für Ägyptische Altertumskunde in Kairo 27: 99-110.
- Setzer, H.W. 1956. Mammals of the Anglo-Egyptian Sudan. – Proceedings of the United States National Museum 106, 3377: 447-587.
- Steder, D. 2013. Hyäne oder Hyänehund? Untersuchungen anhand der Zooarchäologie sowie der Darstellungen und Textzeugen aus dem alten Ägypten. – Verlag Marie Leidorf, Rahden.
- Tallet, P. in works. Entre prise en main et mise en valeur agricole : Les deux faces de la politique égyptienne dans l'ouest du Delta au début de l'histoire égyptienne. In: Yoyotte, M. Ed Riverine Harbours. – Cairo, Institut Français d'Archéologie Orientale.
- Taterka, P. 2019. The secretary Bird of Deir el-Bahari; one more piece to the puzzle of the location of the land of Punt. – Revue d'Égyptologie 69 : 231-249.

Van Neer, W., Linseele, V. & Friedman, R. 2004. Animal burials and food offerings at the Elite cemetery HK6 of Hierakonpolis. In: Hendrickx, S., Friedman, R., Cialowicz, K. & Chlodnicki, M. Eds. *Egypt at its Origins. Studies in Memory of Barbara Adams.* – Leuven, Peeters: 67-130.

Van Neer, W., Linseele, V. & Friedman, R. 2017. More animal burials from the Predynastic elite cemetery of Hierakonpolis (Upper Egypt): the 2008 season. In: Mashkour, M. & Beech, M. Eds. *Archaeozoology of the Near East 9. Volume 2.* – Oxford, Oxbow Books: 388-402.

Vandier d'Abbadie, J. 1964. Les singes familiers dans l'ancienne Egypte (peinture et bas-reliefs). I. *L'Ancien Empire.* – *Revue d'Égyptologie* 16: 146-177.

Van Neer, W. & Uerpman, H.P. 1989. Palaeoecological significance of the Holocene faunal remains of the B.O.S.-missions. In: Kuper, R. Ed. *Forschungen zur Umweltgeschichte der Ostsahara.* – Cologne, Heinrich-Barth-Institut: 309-341.

Wiese, A. 2001. *Antikenmuseum Basel und Sammlung Ludwig: Die Ägyptische Abteilung.* – Mainz am Rhein, Philipp von Zabern.