

CHAPTER 31

**ZOOLOGICAL KNOWLEDGE
IN ANCIENT GREECE AND ROME**

LILIANE BODSON

in

CAMPBELL G.L. (ed.), *The Oxford Handbook of Animals in Classical Thought and Life*, Oxford, Oxford University Press, 2014, 556-578.

Online: <<http://www.promethee.philo.ulg.ac.be/Zoologica/lbodson/bibl/>>.

Warning

Having been printed and edited online without Oxford University Press making it possible to proofread the pages of my contribution to *The Oxford Handbook of Animals in Classical Thought and Life*, Chapter 31 proves to be spoiled in both content and form either by defective lay out in places (see p. 557, Figure 31.1 for the most obvious of the striking examples) or by inaccuracies and inconsistencies, in addition to misprints, throughout. Arbitrarily deleted, added, modified words and phrases affect mainly, yet not only, the formal scientific names of animals with respect to the rules determined by the *International Code of Zoological Nomenclature*.

Consequently, this pdf file cancels the printed-and-online version of Chapter 31 issued under OUP's own and sole responsibility and it provides the only reliable text of the above mentioned chapter.

Whenever referring to it, make sure to mention its status as well as web address—as given below—in order to prevent from any confusion or misunderstanding:

Bodson L. (2014), 'Zoological Knowledge in Ancient Greece and Rome', in Campbell G.L. (ed.), *The Oxford Handbook of Animals in Classical Thought and Life*, Oxford University Press, 556-578, pdf file of the only reliable version: <<http://www.promethee.philo.ulg.ac.be/Zoologica/lbodson/bibl/>>.

Avertissement

Imprimé et édité en ligne sans que Oxford University Press ait consenti à transmettre préalablement une épreuve de ma contribution au volume *The Oxford Handbook of Animals in Classical Thought and Life*, et le fond et la forme du chapitre 31 s'avèrent déparés soit par la mise en page défectueuse de place en place (voir, p. 557, Figure 31.1 pour l'exemple le plus immédiatement saisissant), soit par des inexactitudes et des imprécisions, en plus des coquilles, d'un bout à l'autre. Mots et expressions arbitrairement supprimés, ajoutés, modifiés affectent surtout, mais pas seulement, les noms scientifiques des animaux eu égard aux règles déterminées par le *Code international de nomenclature zoologique*.

En conséquence, le présent fichier pdf annule la version (imprimée et en ligne) du chapitre 31 parue sous la propre et exclusive responsabilité de Oxford University Press et il procure le seul texte fiable du chapitre en cause.

Pour y faire référence, veiller à mentionner son statut ainsi que son adresse Internet afin de prévenir toute confusion ou méprise : Bodson L. (2014), 'Zoological Knowledge in Ancient Greece and Rome' in Campbell G.L. (ed.), *The Oxford Handbook of Animals in Classical Thought and Life*, Oxford University Press, 556-578, seule version fiable: fichier pdf <<http://www.promethee.philo.ulg.ac.be/Zoologica/lbodson/bibl/>>.

CHAPTER 31

**ZOOLOGICAL KNOWLEDGE
IN ANCIENT GREECE AND ROME**

LILIANE BODSON

INTRODUCTION

In the European sphere, studying the animal kingdom as a single coherent field arose during the eighteenth century. The ‘science which treats of animals’ apart from any utilitarian value they may have was called ‘zoology’. This term was derived and adapted from the Latin neologism *zoologia*, coined in the seventeenth century to designate ‘the research into the medicinal properties and uses of substances obtained from wild or domestic, living or dead, animals’ (*Oxford English Dictionary*, online, 2011, s.v. ‘Zoology’). Among primary objectives, the other of ‘the two branches (*zoology* and *botany*) of Natural History’ aimed systematically to collect, describe, identify, name and classify the vertebrate and invertebrate organisms worldwide. To carry out such a programme, the new discipline took advantage of the accomplishments of the Renaissance and the early Modern period. But it did not dismiss the naturalistic legacy of the ancient Greeks and Romans about, for example, eagles and ants and hares and vipers and ibex and tunnies and deers and shrimps, and whatever else (aurochs, cobras, rhinoceros, ostriches, rabbits, peacocks, turtles, locusts, etc.) they had ever recorded.

Despite both peoples’ pervasive interest in nature and its contents, their conception of the perishable ‘animate-living-beings’ (Greek *zōia*, Latin *animalia*) did not result in investigating the ‘perishable non-humans’ (modern: ‘animals’ in the common, exclusive of ‘humans’, meaning) for their own sake. However, as far back as the earliest evidence goes, writings and art representations involved ‘animals’ and, whatever the motivations or purposes, comprised some degree of ‘zoological’ knowledge.

Should the audience have been unaware that only male cicadas ‘sing’, as the saying is’ (Aristotle [384-322 BCE], *History of Animals* 4.9.535b6-9), Homer (c. mid-second half eighth century BCE), whose attention to ‘animals’ || p. 557 (cf. Voultziadou and Tatolas 2005) was of much broader scope and import than assumed in Newmyer’s quick comment (2007: 153), would have spoiled his simile (*Iliad* 3.150-153) of the Trojan elders

‘because of age now ceased from battle, but fully good at talking
upon the city wall like unto cicadas in a forest sitting upon a tree’.

When metaphorically introducing himself as ‘a cicada you have got by the wing’ (fr. 223 [West 1989: 84]) to remind his interlocutor that immobilizing the wings of a (male) cicada would not stop, but would rather amplify the noisy ‘song’,

Archilochus (seventh- to early sixth century BCE) was aware that male cicadas did not emit their song with the wings (as do buzzing bees, wasps, and the like), but in vibrating a pair of drumlike abdominal membranes or tymbals (Bodson, 1976; Beavis, 1988: 100).

The fish *daskillos* and the birds *purroulas*, *epilais*, *oistros* were familiar enough to Aristotle's listeners/readers to spare him any further detail once their names had been stated (*History of Animals* 7[8].2.591a14, 3.592b22) in the discussion on the animal modes of life and habits. The same conclusion applied, for example, to the fish *rubellio* in Pliny the Elder's (c.23-79 CE) *Natural History* 32.138. Similarly, several centuries earlier, the Roman comedy-writer Plautus (c.250-184 BCE) could allude to the *marinus passer* in his comedy *Persa* 198-9, just because the audience was not ignorant of the fact that the 'sea (little-)bird' was neither a seagull nor a cormorant nor any other *sea* bird, but the 'from overseas' ostrich (*Struthio camelus* Linnaeus, 1758; see below 'Latin zoologically-based...': Festus).

The Praying mantis (*Mantis religiosa* Linnaeus, 1758), was (or is at present) hardly alluded to by ancient authors (cf. Davies and Kathirithamby, 1986: 176-80; Beavis, 1988: 85-8). The specimen with displayed wings set as series symbol on coins issued by the Sicilian city of Metapontum (modern: Metaponto) in the fifth century BCE made plain the acute observation of the female mantis's defensive posture and the craftsman's skill in showing it (FIGURE 31.1). The circulation of currency further favoured the diffusion of a typical feature of the insect's behaviour.



FIGURE 31.1 *Mantis religiosa* Linnaeus, 1758. Metapontum. Silver didrachm, c.420. New York, Collection E.T. Newell. From Richter (1930: 41, n° 86 and pl. LXIV, fig. 224). Drawing: Véronique Maes-Hustinx (size 1:1).

Attributes of the internal organization of wild and domestic 'animals' were extensively recorded in Aristotle's 'zoo- and biological' works (on the basis of reported or implied dissections), in veterinary handbooks (cf. Cam, 2007; Ortoleva and Petringa, 2009; Lazaris, 2010); and in treatises of human medicine. For example, Hippocrates (c.460-c.370 BCE or after) commented on the dislocation and treatment of cattle's thigh bones (*Joints* 8). Galen (second century CE), who had to turn to animal dissections and vivisections as replacement for human dissection (Rocca, 2008; Garofalo, 2009: 30), improved the anatomical understanding of simian types, sheep, goats, pigs and bears considerably (cf., for example, *Anatomical procedures, Dissection of muscles*), if not for their own sake (cf. Garofalo, 1991). As for slaughtering and butchering marks on animal bones retrieved from Greek and Roman archaeological sites (e.g., Kotjabopoulou *et al.*, 2003; MacKinnon, 2004) or such artefacts as the bronze model of sheep liver (c.200 BCE, uncovered not far from Placentia, modern: Piacenza) used in hepatoscopy (cf. Van || p. 558 der Meer, 1987), they afforded implicit, yet no less meaningful clues of empirical expertise in animal anatomy.

The ancient Greeks' and Romans' knowledge about 'animals' is still widely documented, even though by a fragmented patchwork made of zooarchaeological findings, works of art and craftsmanship, and textual evidence (from archives and literature). In terms of literature, the 'zoo- and biological' works of Aristotle (384-322 BCE) and the *Natural History* of Pliny the Elder (c.23-79 CE) stand at the forefront—not only for the wealth of their 'zoological' data. Aristotle's search for causes, guided by his philosophical interest in the 'perishable animate-living-beings', introduced the 'non-humans' into theoretical science (*epistēmē*). Intended as an encyclopedic review of the 'animals' known in the first century CE, Books 8-11 of Pliny the Elder's innovative *Natural History* shed light of their own both on the great show (*spectaculum*) of Nature's diversity and on Rome taking command of the world from the late Republic onwards by means of the fauna and its resources (see also Books 28-32).

Under the growing influence of anthrozoology—the study of interaction between people and animals—numerous inquiries into the functions, roles and status of the 'animals' in ancient Greece and in Rome have been made over recent decades. Understandably, the focus was on the human-animal relationship. As a rule, albeit with some exceptions, the zoological background was skimmed over or even left aside. Interdisciplinary research combining the zooarchaeological, iconographic and textual data is needed to pave the way for an updated and substantiated survey of the 'zoological' information underlying ancient Greek and Romans uses of and viewpoints about 'the rest of the animate-living-beings' (*ta loipa zōia, reliqua animalia*). In this chapter, insights into both peoples' ways of grasping the 'perishable non-humans' will be provided through an overview of the first-degree animal names or zoonyms coined in Greek and Latin languages.

|| p. 559 Whereas second-degree appellatives denoted 'animals' in their own types or groups according to age, sex, health, function (e.g., Greek *pattalias* 'pegger', *meta-choiron* 'after-pig', etc.), first-degree animal names distinguished the types or the groups from one another. Some of those names were (a) inherited from the Indo-European language: e.g., Greek *bous*, Latin *bos* ox; Greek *hippos*, Latin *equus* horse; etc. Some were (b) borrowed from substrate or from foreign languages: e.g., Greek *elephas* elephant (from Semitic), Greek *tahōs* peacock (from old Tamil); Latin *hystrix* porcupine (from Greek); Latin *alauda* lark (from Gallic). Some were (c) original coinages: e.g., Greek *akanthias* 'spiny' (spurdog), Latin *Numidica gallina*—'Numidic fowl' (West African guineafowl). Each class is linguistically, historically and zoologically significant. Only the third one is likely to cast light on the ancient Greek and Roman experience of the animal world and on the cognitive mechanisms entailed in the appellatives they created to identify certain of its types and groups. Latin zoonyms, of which many are closely related to Greek ones, raise questions of their own and will therefore be looked at in a separate section.

FIRST-DEGREE ANIMAL NAMES OF GREEK COINAGE

First-degree animal names of Greek coinage can be divided into three categories depending on their etymological references, namely 'zoological', toxicological, anthropological. With respect to the surviving material, 'zoological' appellatives prove to be the largest in number, as they were from the beginning in all likelihood. They will be first exemplified below.

Zoologically-based Category

Greek-coined animal names entering the zoologically-based category were simple nouns or compounds or phrases, some of them involving metaphors or metonymies. They encompassed natural attributes selected as diagnostic criteria among all those noticed in the body, behaviour, location, or reproduction of the concerned types and groups, be they of indigenous or exotic origin. The examples listed hereafter include an English translation, the earliest extant instance or *terminus a quo*, and a translation in binomial nomenclature of modern systematics.

1. Body

1.a. Its whole

kteis ‘comb’

–Metaphor based on comb-teeth like striae of shellfish.

|| p. 560 –*Terminus a quo*: Archippus (fifth to fourth century BCE), [*Fishes*] fr. 24 (Kassel and Austin, 2.1991: 546; origin of fragment: Athenaeus [c.200 CE], *Deipnosophists* 3.32.86c).

–Modern: any of the striated shellfishes, e.g., *Pecten jacobaeus* (Linnaeus, 1758) Pilgrim’s scallop.

Cf. Thompson, 1947: 133-4; Delorme and Roux, 1987: 21-2, 98-101, pl. I, fig. 3-6, pl. II, fig. 1.

1.b. One of its parts

skiouros ‘shadow-tail’

–Metonymic compound.

–*Terminus a quo*: Oppian of Apamea (third cent CE), *Cynegetica* 2.586.

–Modern: *Sciurus vulgaris* Linnaeus, 1758 Red squirrel.

1.c. Colour or pattern

hippotigris ‘horse-tiger’

–Analogy-based compound.

–*Terminus a quo*: Cassius Dio (163-230 CE), *Roman History* 75.14.3, 77.6.2.

–Modern: *Equus grevyi* (Oustalet, 1882) Grévyi’s zebra.

Cf. Bodson, 2005: 464.

1.d. Skin texture

hustrix ‘swine-hair’

–Metonymic compound.

–*Terminus a quo*: Herodot (c.485-after 430 BCE), *Histories* 4.192.2.

–Modern: *Hystrix cristata* Linnaeus, 1758 Crested porcupine.

Cf. Bodson, 2005: 460.

1.e. Smell

bolitaina ‘ill-smelling’

–*Terminus a quo*: Aristotle (384-322 BCE), *History of Animals* 4.1.525a19.

–Modern: *Octopus* gen., e.g., *Octopus vulgaris* Cuvier, 1797 Common octopus.

Cf. Thompson, 1947: 180-1, 188-9; Bodson, 2008: 313-4, n. 268-9.

2. Behaviour

2.a. Songs and cries

kokkux (crying) ‘kok-kux’

–Onomatopoeic metonymy.

A. Bird.

–*Terminus a quo*: Hesiod (c.700 BCE), *Works and Days* 486.

–Modern: *Cuculus canorus* Linnaeus, 1758 Common cuckoo.
Cf. Thompson, 1936: 151-3; Bodson, 1982; Arnott, 2007: 102-3.

B. Sea fish.

–*Terminus a quo*: Epicharmus (sixth to fifth century BCE), [*Sirens*] fr. 122.7 (Kassel and Austin, 1.2001: 94; origin of fragment: Athenaeus [c.200 CE], *Deipnosophists* 7.84.309f).

–Aetiology: ‘makes a noise like the cuckoo’ (Aristotle, *History of Animals* 4.9.535b18-20).

|| p. 561

–Modern: *Chelidonichthys cuculus* (Linnaeus, 1758) Red gurnard.

Cf. Lacroix, 1937b: 280-1; Strömberg, 1943: 64-5, 71, 134; Thompson, 1947: 119-20.

2.b. Tracking techniques

ichneutēs, ichneumōn ‘tracker’

A. Life-bearing quadruped tracking crocodiles’ and venomous snakes’ eggs.

–*Terminus a quo*: Herodot (c.485-after 430 BCE), *Histories* 2.67.1 (-*tēs*); Aristotle (384-322 BCE), *History of Animals* 8(9).6.612a16 (-*mōn*).

–Modern: *Herpestes ichneumon* Linnaeus, 1758 Ichneumon, Egyptian mon-goose.

Cf. Bodson, 2005: 462.

B. Wasp.

–*Terminus a quo*: Aristotle, *History of Animals* 5.20.552b26-30 (-*mōn*); 8(9).1.609a5-6 (-*mōn*).

–Modern: e.g., *Sphecidae* Latreille, 1802 Sphecids, e.g., *Sceliphron spirifex* (Linnaeus, 1758) Mud dauber.

Cf. Beavis, 1988: 189.

C. Bird.

–*Terminus a quo*: Antoninus Liberalis (second century CE), *Collection of Metamorphoses*, 14 (-*mōn*).

Cf. Thompson, 1936: 128 (‘An unknown or fabulous small bird’); Arnott, 2007: 76 (‘not unthinkable that the name Ichneumon the commoner word for Mon-goose could similarly have been given also to the bird’).

2.c. Fishing techniques

halieus ‘angler’

–Metaphor.

–*Terminus a quo*: Aristotle (384-322 BCE), *History of Animals* 8(9).37.620 b11-19.

–Alternative metaphorically referring to general shape and posture on seabed: *batrachos* [*thalassios*] ‘marine frog’ (cf. Aristotle, *Generation of Animals* 3.1.749a23, etc.).

–Modern: *Lophius piscatorius* Linnaeus, 1758 Anglerfish.

Cf. Lacroix, 1937a: 48 and pl. XIX; Strömberg, 1943: 33, 92-3; Thompson, 1947: 28-9; Delorme and Roux, 1987: 53, pl. 128-9, fig. 4-5; McPhee and Trendall, 1987: e.g., 132, no. 151 and pl. 55 d; 1990: 42, no. 151b and pl. 11.3.

2.d. Fighting spirit

*alektruōn**, *alektōr*** ‘repeller’

–*Terminus a quo*: Theognis of Megara (c.640-600 or mid-sixth century BCE), 864* (West, 1989: 215); Simonides of Ceos (c.556-467/6), fr. 78** (Page, 1962: 300; origin of fragment: Athenaeus [c.200 CE], *Deipnosophists* 9.16.374d).

–Alternative: *Persikos ornīs* (see below ‘3. Locations’, s.v. 3.b).

–Modern: *Gallus gallus* forma bankhiva (Linnaeus, 1758) Red jungle fowl, forma domestica (Linnaeus, 1758) Domestic cock.

Cf. Thompson, 1936: 33-44; Arnott, 2007: 9-11.

2.e. Biorhythms

nukteris ‘at-night-active’

A. Bat.

–*Terminus a quo*: Homer (c.mid-/second half eighth century BCE), *Odyssey* 12.433, 24.6-8.

|| p. 562 –Aetiology: ‘by-night-feeding (*nukterobios*)’ (Aristotle, *History of Animals* 1.1.488a25).

–Modern: *Chiroptera*, in Greece e.g., *Rhinolophus ferrumequinus* (Schreber, 1774) Greater horseshine bat; *Eptesicus serotinus* (Schreber, 1774) Serotine bat.

B. Fish.

–Metaphor.

–*Terminus a quo*: Oppian of Cilicia (second century CE), *Halieutica* 2.204-5.

–Aetiology: ‘only at night does he awake and wander abroad; wherefore he is also called *nukteris* “bat” ’ (Oppian of Cilicia [second century CE], *Halieutica* 2.204-5).

–Alternative: *hēmerokoitēs* ‘sleeping-by-day’ (Oppian, *Halieutica* 2.199, 203, 224).

–Modern: *Uranoscopus scaber* Linnaeus, 1758 Stargazer.

Cf. Strömberg, 1943: 111, cf. 57-8; Thompson, 1947: 75-6, cf. 98-9, s.v. ‘*kallioñumos*’ (other alternatives, among which the zoologically-based *ouranoskopos* ‘sky-observer’, *psammodutēs* ‘sand-dweller’); Delorme and Roux, 1987: 51, 54, 124, pl. XIV, fig. 6-7; McPhee and Trendall, 1990: 43, no. 14a and pl. 11.4.

3. Locations

3.a. Habitat

ammodutēs ‘sand-dweller’

(i) In Bactria (modern Afghanistan).

–*Terminus a quo*: [Callisthenes] (c.370-327 BCE), *Historia Alexandri Magni* 3.17.19: *Alexander’s Letter to Aristotle* (Feldbusch, 1976: 36-7).

–Modern: *Eristicophis macmahonii* Alcock and Finn, 1897 Macmahon’s viper.

(ii) In desert between Pelusion and recess of the gulf at City-of-Heroes (modern Gulf of Suez).

–*Terminus a quo*: Strabo (c.64 BCE-c.19 CE), 17.1.21 (C. 803).

–Alternative: *kausōn* (see below ‘Toxicologically-based...’).

–Modern: *Cerastes vipera* (Linnaeus, 1758) Sahara sand viper.

Cf. Bodson, 2012: 104-15, 134.

3.b. Zoogeography

Indikon orneon ‘Indian bird’

–*Terminus a quo*: Aristotle (384-322 BCE), *History of Animals* 7(8).12.597b27.

–Alternative: *psittakē* (Aristotle, *History of Animals* 7(8).12.597b27); on *bitakos*, earliest of extant variant forms, cf. Ctesias of Cnidos (c.mid-fifth to early fourth century BCE), 688F45.8 Jacoby, 1958: 488.3; origin of fragment: Photius (c.810-c.893), *Library* 45a.

–Modern: *Psittacula* gen. Cuvier, 1800 Parakeet.

Cf. Thompson, 1936: 335-8; Arnott, 2007: 201-3.

Persikos ornīs ‘Persian bird’

A. Domestic cock (actually originating in India, yet first known to the Greeks through Persia).

–*Terminus a quo*: Aristophanes (c.445-after 388 BCE), *Birds* 485, 707.

–Alternative: *alektruōn*, *alektōr* (see above ‘2. Behaviour’, s.v. 2.d).

–Modern: *Gallus gallus* forma *bankhiva* (Linnaeus, 1758) Red Jungle fowl, forma *domestica* (Linnaeus, 1758) Domestic cock.

B. Peacock (actually originating in India, yet first known to the Greeks through Persia).

–*Terminus a quo*: scholion in Aristophanes, *Birds* 707 (Dübner, 1843: 225-6).

–Alternative: *tahōs* (Old Tamil loanword).

–Modern: *Pavo cristatus* Linnaeus, 1758 Indian peafowl.

Cf. Thompson, 1936: 33-44, 277-81; Bodson, 2005: 455-6 (on acclimatization in ancient Greece: 1998a: 166-77, summarized 1998b: 78-81); Arnott, 2007: 235-8.

4. *Physiology of Reproduction**echidna*, *echis* ‘viper’

–*Terminus a quo*: Herodot (c.485-after 430 BCE), *Histories* 3.108.1, 109.1 and 3; cf. Plato (428/7-348/7 BCE), *Symposium* 217e.

–Ancient Greek etymology (modern: unknown etymology): ‘keeping (*echein* to have, to keep) its young inside (and laying them down alive)’, cf. Aristotle, *History of Animals* 3.1.511a16, 5.34.558a25-b4; *Generation of Animals* 2.1.732b21.

–Modern: ovoviviparous *Viperidae* Oppel, 1811 Viperids, e.g., in Greece *Vipera ammodytes meridionalis* Boulenger, 1903 Nose-horned viper.

Cf. Bodson, 2009: 92-8.

‘Zoological’ Alternatives

Some ‘animals’ were called by more than one name, some by as many seven (cf. Bodson, 2009: 111), somewhat complementing each other. ‘Zoological’ alternatives highlighted multiple naturalistic characteristics (e.g., see above 2.c: behaviour and shape, 2.d: behaviour and zoogeography). Therefore they throw further light on the process of selecting diagnostic criteria and implicitly testify to the ancient Greeks’ particular attention to the ‘animals’ under consideration either because they were ‘highly visible, widely prevalent in the environment and frequently observed’ (Berlin, 1992: 110) and—or—because of their roles in and influences upon everyday life.

‘Zoological’ Homonyms

‘Zoological’ homonyms matched two or more ‘animals’ in view of likenesses speaking for themselves in the ancient Greeks’ perception of physical traits (shape, appendages, colours), or of ways of behaving (e.g., above: 2.a. Songs and cries, 2.b. Tracking technics, 2.e. Biorhythms). Life-bearing quadrupeds, birds, insects and other invertebrates were involved in transfers of that kind. Yet, so many of them occurred from the terrestrial and aërian fauna to the aquatic world that eventually the latter mirrored the former somehow or other.

|| p. 564 Toxicologically-based Category

Originating in the Greeks' anthropo-zoological approach to health problems caused by venoms and poisons, toxicologically-based animal names of Greek coinage distinguished venomous and poisonous 'animals' by the symptoms and syndromes of their strikes, bites, stings or contacts affecting humans and life-bearing quadrupeds. They were mainly alternatives to zoologically-based appellatives and applied not only to Greek, Asian, North African vipers, but also, as for *sēps* 'putrefying', to other vertebrates and to invertebrates (cf. Bodson, 2009). Most toxicologically-based zoonyms were borrowed from the medical vocabulary. For instance:

kausōn 'burning enfeverisher'

–Loanword.

–*Terminus a quo*: Philomenus (second century CE), *De venenatis animalibus* 20.1 (Wellmann, 1908: 26.15).

–Alternative: *ammodutēs* (see above 'Zoologically-based...', s.v. 3. Locations': a. [ii]).

–Modern: *Cerastes vipera* (Linnaeus, 1758) Sahara sand viper; *Cerastes cerastes* (Linnaeus, 1758) Sahara horned viper.

Cf. Bodson, 2012: 118-21, 131-3.

Irrespective of their first, somewhat technical, senses, all proved to have been commonly understood and in use until late in Greek Antiquity, even down to the end of the Byzantine period.

Anthropologically-based Category

Anthropologically-based animal names consisted of coinages stemming from the Greeks' cultural traditions, beliefs and customs.

1. Taste and Flavour

eritimos (literally 'highly-prized'), 'dainty'

–*Terminus a quo*: Diphilus of Siphnos (third century BCE), [*On Food for Sick and Well*] in Athenaeus (c.200 CE), *Deipnosophists* 8.52.355f (*eritimos* as alternative of other praised small fishes in Greek dialects: see, e.g., references pointed out by Athenaeus, *Deipnosophists* 7.137.328f-329a).

–Modern: Mediterranean small (sardine- or sprat-like) fish, see e.g., *Clupeidae* Cuvier, 1817 Clupeids.

Cf. Strömberg, 1943: 15, 33; Thompson, 1947: 65; Dalby, 2003: 16 s.v. Young shad, 298 s.v. Shad.

2. Mythological Borrowings

adōnis 'adonis'

|| p. 565

–Metaphor.

–*Terminus a quo*: Clearchus of Soloi (fourth to third century BCE), [*Water Animals*] fr. 101 (Wehrli, 1969: 37-8, 81-2; origin of fragment: Athenaeus (c.200 CE), *Deipnosophists* 8.5.332c-e).

–Alternative (Clearchus of Soloi, [*Water Animals*] fr. 101: *exōkoitos* 'outlying (fish)', 'in calm weather, leaping out with the surf and lying a long time on the pebbles, sleeping on dry land, ... until once more the surf catches it up and carries it with the reflux back into the sea, etc.')

–Aetiology: ‘those who first called it adonis were hinting (so I think) at Adonis whose life was divided between two goddesses: one who loved him was beneath the earth, the other above.’ (Aelian [c.170-235 CE], *Characteristics of Animals* 9.36).

–Modern: e.g., (?) *Blenniidae* Rafinesque, 1810 Blennies.

Cf. Strömberg, 1943: 58; Thompson, 1947: 3, 63-4.

meleagris ‘Meleagros’ mourning sister’

–Metaphor.

–*Terminus a quo*: Sophocles (c.497-406 BCE), fr. 830a (Radt, 1977: 551; origin of *testimonium*: Pliny the Elder [c.23-79 CE], *Natural History* 37.40).

–Aetiology: Meleagros’s sisters metamorphosed into guineafowls after the hero’s tragic death.

–Modern: *Numida meleagris meleagris* (Linnaeus, 1758) East African helmeted guineafowl (blue wattles).

–Remark: nothing is known of the conceivably pre-existing Greek ‘zoological’ appellative.

Cf. Thompson, 1936: 197-200; Bodson, 2005: 456; Arnott, 2007: 138-40.

Stumphalis ‘Stymphalian’

A. Fabulous birds dwelling in and around a lake near the town of Stymphalus (Greece, NE Arcadia), endangering the human life, chased away by Heracles (his fifth labour), later resettled on the ‘island of Ares’ (Black Sea).

Variouly depicted on Greek vases and coins.

Cf. Thompson, 1936: 273-4; Arnott, 2007: 231-2.

B. (i) Bird profiled and captioned *stumphalis* on Artemidorus Papyrus (verso: seventh drawing).

–*Terminus a quo*: early first century CE.

–Modern: *Casuarium casuarium* (Linnaeus, 1758) Southern cassowary.

Cf. Kinzelbach, 2009: 27-9 and Table VIII.18-20; 2012.

(ii) Predatory bird in the Arabian desert.

–*Terminus a quo*: Pausanias (second century CE), 8.22.4-5.

–Comparative description (Pausanias, 8.22.4-5): ‘in all respects as ferocious as lions and leopards, ... the size of a crane, looking like ibises, but ... sturdier beaks and not curved like that of the ibises.’ See also 8.22.6: Pausanias’s speculative remarks about Arabian breed and Greek zoonym.

Cf. Arnott, 2007: 232 (‘fits only the Lammergeier, a Vulture still found in southern Arabia’).

Zoologically-based category

Latin zoologically-based coinages referred to body shape, colour and pattern, behaviour, geographic location of indigenous and exotic types as well. For instances:

1. Body

1.a. General shape

perna ‘ham’

–Metaphor.

–*Terminus a quo*: Pliny the Elder (c.23-79 CE), *Natural History* 32.154.

–Alternative: *pinna* (Greek loanword).

- Aetiology: ‘They stand like pigs’ hams (*pernae*) fixed bolt upright in the sand.’ (*Natural History* 32.154).
- Modern: *Pinna nobilis* Linnaeus, 1758 Noble pen shell.
Cf. De Saint-Denis, 1947: 87; Thompson, 1947: 200-2; Peurière, 2003: 38.

1.b. Colour or pattern

sturnus ‘starry’

- Terminus a quo*: Pliny the Elder (c. 23-79 CE), *Natural History* 10.72-73.
- Modern: *Sturnus vulgaris* Linnaeus, 1758 Common starling.
Cf. André, 1962: 157-8 (about aetiology: winter feather); Capponi, 1979: 473-5; Arnott, 2007: 199-200 (s.v. ‘psar’).

2. Behaviour

ouifera ‘wild ewe’

- Metaphoric compound.
- Terminus a quo*: Pliny the Elder (c.23-79 CE), *Natural History* 8.69.
- Alternative: *camelopardalis* (Greek loanword).
- Aetiology (Pliny the Elder, *Natural History* 8.69): ‘has ... a neck like a horse, feet and legs like an ox, and a head like a camel, and is of a ruddy colour picked out with white spots, owing to which it is called *camelopardalis* ... more remarkable for appearance than for ferocity, and consequently it has also got the name of ‘ “wild ewe” ’.
- Modern: *Giraffa camelopardalis* (Linnaeus, 1758) Giraffe.
Cf. Bodson, 2005: 464, 470-2.

3. Location

Luca bos ‘Lucanian cow’

- Terminus a quo*: Naevius (active in second half of third century BCE), fr. 63 (Morel, 1927: 28; origin of fragment: Varro [116-27 BCE], *On the Latin Language* 7.39); Plautus (c.250-184 BCE), *Casina* 846.
- || p. 567 –Aetiology: ‘our compatriots ..., when among the Lucanians [modern province of Basilicata, South Italy], in the war with Pyrrhus [281-278 BCE], they first saw elephants in the ranks of the enemy ..., called the animal ... “Lucanian cow” ’ (Varro, *On the Latin Language* 7.39). Cf. Pliny the Elder, *Natural History* 8.16.
- Modern: *Elephas maximus* Linnaeus, 1758 Indian elephant.
Cf. Toynbee, 1973: 33-4; Scullard, 1974: 101-113.

Numidica gallina ‘Numidic hen’

- Terminus a quo*: Publilius Syrus (first century BCE) in Petronius (first century CE), *Satiricon* 55 (verse 4).
- Aetiology: ‘in the Numidian part of Africa the Numidic fowl’ (Pliny the Elder, *Natural History* 10.132).
- Modern: *Numida meleagris sabyi* Hartert, 1919 Saby’s helmeted guineafowl (red wattles; range: Morocco); *Numida meleagris galeata* Pallas, 1767 West African helmeted guineafowl (red wattles).
Cf. Capponi, 1979: 258-9; Bodson, 2005: 456; Arnott, 2007: 138-40.

Apart from *Numidica gallina*, specific appellative of the Western guineafowl (see below ‘Anthropologically-based...’), the above Latin-coined animal names (and many other ones) are found explicitly connected with transliterated Greek borrowings: *pinna* versus *perna*, *camelopardalis* versus *ouifera*, *elephantus* (and metaplasm *elepha[n]s*,

cf. Zamboni, 2005: 442-3) versus *Luca bos*, etc. The need and advantage of Greek doublets of Latin-coined zonyms have long been questioned by modern scholarship. Festus's (second century CE) entry '*Passer marinus*' (Lindsay, 1913: 248.24; see above 'Introduction': Plautus, *Persa* 198-9)

Passer marinus: 'from over-sea (little)-bird' which general public (*uulgus*) calls *struthocamelus* [(little)-bird-camel(-size-like)].'

suggests that they easily entered the vocabulary of the bilingual society that Rome was to become. As for Pliny the Elder's supposed eagerness to show off his command of Greek animal names (André, 1967: 9), such a viewpoint has yet to be confirmed. At this stage (cf. Guasparri, 2008), nothing stands seemingly against the idea that Greek doublets were as colloquial as Latin coinages and both used interchangeably.

All transliterated Greek borrowings, e.g., *sciurus* 'squirrel' (Pliny the Elder, *Natural History* 8.138; see above 'Greek zoologically-based..., 1. Body', s.v. 1.b) did not—or do not anymore—coexist with Latin native equivalents. Be that as it may, loan translations or calques were experienced at an early stage, judging from Ennius's (239-169 BCE) translation-adaptation of Archestratus of Gela's (late fourth to third century BCE) *Hēdupatheia*, that is *Life of Pleasure* (cf. Olson and Sens 2000). Centuries later, Apuleius of Madaura (second century CE), who referred to Ennius's verses, was still at work, translating Greek ichthyonyms (*Apologia* 36.1, cf. 29-41 *passim*) in such a way that they sounded 'struck from a Latin mint' (*Apologia* 38.3: '*Latina moneta percussa*'; cf. Rochette 2005: 293-4). However, the circumstances in which a great many Latin zoologically-based appellatives closely paralleling Greek ones were 'struck' are not documented. Even in chapters of the *Natural History* obviously abridging Aristotle's 'zoological' material, there are generally no proofs or, at least, clues to help decide whether Pliny the Elder utilized Latin loan translations (either of his own or got from his sources) or Latin coinages grounded on the Romans' own perception of and choice between the same diagnostic criteria as those || p. 568 once noticed and selected by the Greeks about the same 'animals'. Compare, for example, *aurata* 'golden' versus *chrysophrys* 'goldeyebow' (modern: *Sparus aurata* Linnaeus, 1758 Gilthead seabream), *gladius* 'sword' versus *xiphias* 'sword' (modern: *Xiphias gladius* Linnaeus, 1758 Swordfish). Pliny the Elder's statement on, for example, *marina urtica*, in explicit comparison with Greek (Latin spelling) *cnide* 'sea nettle' (*Natural History* 32.146) does not allow much doubt to remain about the latter of the alternative, at least on the subject of sea anemones. As seen above (cf. *perna*, *sturnus*, *ouifera*, *Luca bos*, *Numidica gallina*), the Romans proved to be no less adept at coining zonyms than did the Greeks. The status of a number of so-called Latin calques needs to be reassessed.

Toxicologically-based Category

Latin toxicologically-based animal names (e.g., *dipsas*, *haemorrhoids*, *prester*, *seps*) were transliterated Greek borrowings. It is noteworthy that *seps* as alternative of the Greek loanword *pityocampa* '(processionary) pine caterpillar' (e.g., Pliny the Elder, *Natural History* 23.62) does not occur in extant Latin literature (cf. Bodson, 2009: 210). Conversely, *sēps* as a synonym of Greek *skolopendra* 'centipede' is read only in Latin *seps* (Latin *centipeda*, *millipeda*, *multipeda*, *scolopendra*; cf. Bodson, 2009: 185-7).

Anthropologically-based Category

Latin anthropologically-based zoonyms were also transliterations from the Greek. The fish name *adonis* (see above ‘Greek anthropologically-based..., 2. Mythological’, s.v. *adōnis*) was echoed by Pliny the Elder (*Natural History* 9.70; cf. De Saint-Denis 1947: 4). As seen above (‘Greek anthropologically-based..., 2. Mythological’), the Greek bird name *meleagris* survived through Pliny the Elder’s *testimonium*. Its Latin transliteration (*terminus a quo*: Varro [116-27 BCE], *On Agriculture* 3.9.18) specifically distinguished the East African guineafowl (cf. Columella [first century CE], *On Agriculture* 8.2.2) from its West African counterpart named with the Latin coinage *Numidica gallina* (see above ‘Latin zoologically-based..., 3. Location’).

COINING ANIMAL NAMES IN ANCIENT GREEK AND IN LATIN

Who, When, Where, How, Why

In the present state of documentation, the contextual conditions of coining Greek and Latin first-degree animal names can be outlined as follows.

|| p. 569

Who?

Supposing that the identity of any person who ever coined Greek zoonyms (in their three categories) and Latin zoologically-based ones was recorded other than orally, there is no longer any evidence for it and speculations about it would be pointless. Conversely, the subject matters inherent to the appellatives support the hypothesis that they were invented by practitioners of some expertise working or getting into close contact with nature and ‘animals’, i.e., hunters, woodcutters and gatherers, anglers, fishermen and divers, farmers and gardeners, breeders and bee-keepers, veterinarians, physicians and pharmacologists, travellers, etc.

When?

In both languages, animal appellatives were created at unspecified times. Apart from zoonyms reported in dated or datable contexts of the discovery of or first encounter with exotic sorts (see above ‘Latin zoologically-based..., 3. Location’, s.v. *Luca bos*), the earliest, preserved by chance, records of coinages provide the modern readership with nothing but the *terminus a quo* (‘limit from which’) or currently starting point.

Where?

Not unexpectedly, the geographic areas where data underlying Greek and Latin first-degree zoologically-based animal names were collected are a less speculative question than are the places of coining. Still, locating the environmental origin of ‘zoological’ information involved in the etymology of zoonyms of Greek and Latin coinages does not raise the same issues when the animal types or groups ranged over different territorial extensions, e.g., throughout the Euro-mediterranean zone of Greek settlements or in confined regions. Latin *Numidica gallina* resulted from the Romans’ discovery of guineafowls in the western part of North Africa (see above ‘Latin zoologically-based..., 3. Location’). The Greek metaphoric appellative *kteis* ‘comb’ was inspired by scallops and other striated shells (see above ‘Greek zoologically-based..., 1. Body’, s.v. 1.a) observed anywhere in the Mediterranean zone.

How?

The senses of sight (the naked eye), hearing, smell, touch, and also taste (see above ‘Greek anthropologically-based...’, 1. Taste’, *s.v. eritimos*) supplied the empirical data among which were pinpointed distinctive features admitted as diagnostic to produce zoologically-based appellatives in particular. Alternatives or synonyms (see above ‘Greek zoologically-based...’) further portrayed some of the ‘animals’ by means of multiple names either based on ‘zoological’ criteria (see above ‘Greek zoologically-based...’, 2. Behaviour’, *s.v. 2.d* and *e: alektruōn, nukteris*) only or on mixed criteria: either ‘zoological’ and toxicological (see above ‘Greek zoologically-based...’, 3. Locations’, *s.v. 3.a. ammodutēs* [ii]) or ‘zoological’ and anthropological (see above ‘Greek anthropologically-based...’, 2. Mythological’, *s.v. adōnis*). ‘Zoological’ homonyms (see above ‘Greek zoologically-based...’, 2. Behaviour’, *s.v. 2.a. kokkux*) implicitly related to || p. 570 sensible, albeit face-value, comparisons. Explicit comparisons referring to familiar ‘animals’ were usual to describe indigenous and exotic types or groups formerly unknown or little known (see above ‘Greek anthropologically-based...’, 2. Mythological’, *s.v. stumphalis* B [ii]; ‘Latin zoologically-based...’, 2. Behaviour’, *s.v. ouifera*). However, in the surviving textual sources on the whole, whatever the losses in transmission, ‘zoological’ descriptions were generally either omitted or shortened in the extreme. Their conciseness makes it plain that the authors relied confidently upon their audience’s own awareness with both the zoonyms and the considered organisms.

Why?

In ancient Greece and Rome, vital needs and practical concerns were the primary and—to judge by the extant material—only motivations for initially coining first-degree animal names. At an early stage, in respect of the anonymous inventors’ aims and empirical approach, they were intended to distinguish the animal types from each other and to record them not exhaustively for their own sake, but selectively depending on the help, advantage, profit—or the reverse—they (or their products) brought to people’s lives. No subsequent purpose prompted either comprehensive ‘zoological’ examination or any change in the principles and rules of animal naming. Hence Aristotle’s ‘zoo- and biological’ works did not contain any other animal appellatives than those that were in common use and no name at all for such ‘animals’ as, for example, small crabs (*History of Animals* 4.2.525b6) and small insects (*History of Animals* 5.20.552b31) which were said to be purely and simply ‘nameless (*anōnuma*)’ (cf. Louis, 1971).

CONCLUSION

First-degree animal appellatives of Greek and of Latin coinages were as dissimilar to a nomenclature—*i.e.*, a ‘system of names, and provisions for their formation and use’ (*International Code of Zoological Nomenclature* 1999: 111; cf. Minelli and Fusco, 2012)—as are colloquial or vernacular terms to Latin binomials since mid-eighteenth century. Nonetheless, every time that ancient diagnostic traits and other naturalistic features are found consistent with their counterparts determining monotypic species in modern systematics, Greek and Latin first-degree animal names are interpreted with the same precision, *e.g.*, ancient Greek *epops* in continental Greece: *Upupa epops* Linnaeus, 1758 Eurasian hoopoe, Latin *sturnus* in Italy: *Sturnus vulgaris* Linnaeus, 1758 Common starling (see above ‘Latin zoologically-based...’, 1. Body’, *s.v. 1.b*). But some of the presently pertinent attributes could not be perceived by

the naked eye, while others were not recorded or got lost in transmission. And, first and foremost, a thorough, zoologically-minded, description was outside the ancient Greeks' and Romans' ways of characterizing the 'perishable non-humans'. Therefore most of the first-degree animal names turn out to correspond to taxons of ranks above that of individual species: genus, family, etc., even up to full class (*e.g.*, land *skolopendrai*: Chilopods; see || p. 571 Bodson, 2009: 192-5)—nineteenth- and twentieth-century assessments of the so-called 'species' in Aristotle's 'zoo- and biological' treatises notwithstanding.

By comparison with the other two classes of ancient Greek and Latin first-degree animal names, it is only coinages that open a window on the Greeks' and Romans' empirical and multi-sided approach to the 'animals' through data of three kinds. Even within the limited range of examples shown above, diagnostic qualities relating to morphology, behaviour, location, physiology originated in indisputably careful 'zoological' observations. As regards the toxicologically-based zoonyms, venomous or poisonous symptoms and syndromes were the cause of their out-of-the-ordinary borrowing from the Greek medical terminology. The third, anthropologically-based, category consisted mostly of metaphors taking roots in mythical beliefs and traditions eventually shared by both Greeks and Romans. Stemming from people's experience, coined in currently unknowable circumstances (with few exceptions), first-degree animal names of Greek and Latin coinages identified some types and groups in 'the rest of the perishable animate-living-beings' with respect to matters of general or particular, yet mainly practical interest. Whatever their etymological contents, all conveyed explicit or implicit items of 'zoological' knowledge, but nothing to indicate or to suggest that they ever proceeded from an investigation for its own sake. Ultimately, the ancient Greek- and Latin-coined animal appellatives were—and still are—highly informative about the Greeks' and Romans' ways of dealing with 'the perishable, either non-human or human, animate-living-beings'.

(p. 571 cont.)

SCIENTIFIC ANIMAL NAMES

<i>Blenniidae</i>	<i>Numida meleagris sabyi</i>
<i>Casuarius casuarius</i>	<i>Octopus gen.</i>
<i>Cerastes cerastes</i>	<i>Octopus vulgaris</i>
<i>Cerastes vipera</i>	<i>Pavo cristatus</i>
<i>Chelidonichthys cuculus</i>	<i>Pecten jacobaeus</i>
<i>Chiroptera</i>	<i>Pinna nobilis</i>
<i>Clupeidae</i>	<i>Psittacidae</i>
<i>Cuculus canorus</i>	<i>Psittacula gen.</i>
<i>Elephas maximus</i>	<i>Rhinolophus ferrumequinus</i>
<i>Eptesicus serotinus</i>	<i>Sceliphron spirifex</i>
<i>Equus grevyi</i>	<i>Sciurus vulgaris</i>
<i>Eristicophis macmahonii</i>	<i>Sparus aurata</i>
<i>Gallus gallus forma bankhiva</i>	<i>Sphexidae</i>
<i>Gallus gallus forma domestica</i>	<i>Struthio camelus</i>
<i>Giraffa camelopardalis</i>	<i>Sturnus vulgaris</i>
<i>Herpestes ichneumon</i>	<i>Upupa epops</i>
p. 572 <i>Hystrix cristata</i>	<i>Uranoscopus scaber</i>
<i>Lophius piscatorius</i>	<i>Vipera ammodytes meridionalis</i>
<i>Mantis religiosa</i>	<i>Viperidae</i>
<i>Numida meleagris galeata</i>	<i>Xiphias gladius</i>
<i>Numida meleagris meleagris</i>	

(p. 572 cont.)

ENGLISH ANIMAL NAMES

Anglerfish	Parakeet
ants	peacock(s)
aurochs	pigs
bat	Pilgrim's scallop
bears	porcupine
bee	Praying mantis
birds	 p. 574 (processionary) pine caterpillar
Blennies	Psittacids
camel	rabbits
cats	Red gurnard
centipede(s)	Red jungle fowl
Chilopods	Red squirrel
cicada(s)	rhinoceros
cobras	Saby's helmeted guineafowl
 p. 573 Common cuckoo	Sahara horned viper
Common octopus	Sahara sand viper
Common starling	sea anemones
cormorant	seagull
crabs	sea nettle
crane	Serotine bat
Crested porcupine	sheep
deers	shellfish
Domestic cock	shrimps
eagles	simian types
East African helmeted guineafowl	Southern cassowary
Egyptian mongoose	Sphecids
elephant(s)	sprat-like fish
Eurasian hoopoe	spurdog
fish	Stargazer
Gilthead seabream	Swordfish
Giraffe	tunnies
goats	turtles
Greater horseshine bat	Viperids
Grévyi's zebra	vipers
guineafowl(s)	wasps
hares	West African helmeted guineafowl
hoopoe	
horse	
ibex	
ibises	
Ichneumon	
Indian elephant	
Indian peafowl	
Insects	
Lammergeier	
lark	
locusts	
Macmahon's viper	
Mud dauber	
Noble pen shell	
Nose-horned viper	
ostrich(es)	
ox	

(p. 574 cont.) SUGGESTED READING

In respect of the aims of modern scholarship, the scope of its books, the evidence either available or purposely selected at the time of writing, the methodological approaches to the ancient Greeks' and Romans' zoological knowledge prove either to combine both naturalistic and historico-cultural options, or to favour the former or the latter to some greater or smaller extent also by means of typological catalogues (zoo-archaeological remains, archaeological artefacts). The only overview of the interaction between not only the ancient Greeks and Romans but also the other Mediterranean civilizations and the animal world is Keller (1909-13, cf. 1887). Even though understandably outdated in the main, it is still || p. 575 somewhat of a must (for a zoologically-organized selection of translated Greek and Latin material, see Lenz, 1856). The naturalistic focus is emphasized in Voultziadou and Tatolas (2005) regarding the Homeric age, and in Jashemski and Meyer (eds.) (2002) regarding the particular region of Pompeii and Campania; on the early stages of historical ecology, see Egerton (2012). Whereas Jennison (1937) investigates the 'animals' involved in the private and public shows and games of ancient Rome, Toynbee (1973) provides an overall review of wild and domestic types and of their roles in Roman life and art. Some works pay attention to such groups or types as, for example, apes and monkeys (McDermott, 1938, based on a catalogue of figurines, vases, paintings—excluding on vases—mosaics and reliefs), elephants (Scullard, 1974), birds (Pollard, 1977; Lunczer, 2009), insects (Davies and Kathirithamby, 1986; Beavis, 1988), cats (Engels, 1999), bears (Eichinger, 2005, including ancient Orient and Egypt) either in ancient Greece or in both Greece and Rome. Dierauer (1977) and Sorabji (1993) examine some aspects of the concept of 'perishable animate-living-being' (*zōion*, *animal*). Animal types and groups observed in distant lands, their particular attributes and the ancient Greeks' and Romans' discussions about them are explored by Li Causi (2003, 2008). See also 'Suggested reading' in the above and below chapters and bibliographies in the books and articles listed hereafter.

REFERENCES

Unless otherwise stated, translations of Aristotle's works are borrowed from or adapted from the Revised Oxford Translation (see below *s.v.* Barnes), translations of Pliny the Elder's *Natural History* and of other Greek and Latin authors are borrowed from or adapted from the Loeb Classical Library.

- André, J. (1967), *Les noms d'oiseaux en latin*, Paris, Klincksieck.
- Arnott, W.G. (2007), *Birds in the Ancient World from A to Z*, London and New York, Routledge.
- Balme, D.M. (2002), *Aristotle Historia animalium, I: Books I-X: Text*, prepared for publication by A. Gotthelf, Cambridge, Cambridge University Press (reference edition).
- Barnes, J. (1985), *The Complete Works of Aristotle. The Revised Oxford Translation*, 2 volumes, 2nd printing, Princeton, NJ, Princeton University Press.
- Beavis, I.C. (1988), *Insects and Other Invertebrates in Classical Antiquity*, Exeter, University of Exeter.

- Berlin, B. (1992), *Ethnobiological Classification: Principles of Categorization of Plants and Animals in Traditional Societies*, Princeton, NJ, Princeton University Press.
- Bodson, L. (1976), 'La stridulation des cigales. Poésie grecque et réalité entomologique', *L'Antiquité classique* 45, 75-94
(online <<http://www.promethee.philo.ulg.ac.be/zoologica/lbodson/bibl>>).
- (1982), 'L'apport de la tradition gréco-latine à la connaissance du Coucou gris (*Cuculus canorus* L.)', *History and Philosophy of the Life Sciences* 4, 99-123 (online <<http://www.promethee.philo.ulg.ac.be/zoologica/lbodson/bibl>>, with correct lay out of figure 2, also in *History and Philosophy of the Life Sciences* 5).
- (1998a), 'Contribution à l'étude des critères d'appréciation de l'animal exotique dans la tradition grecque ancienne', in L. Bodson (ed.), *Les animaux exotiques dans les relations internationales : espèces, fonctions, significations. Journée d'étude – Université de Liège, 22 mars 1997*, || p. 576 Liège, University of Liège, 139-212
(online <<http://www.promethee.philo.ulg.ac.be/zoologica/lbodson/bibl>>).
- (1998b), 'Ancient Greek Views on the Exotic Animal', *Arctos* 32, 61-85 (online <<http://www.promethee.philo.ulg.ac.be/zoologica/lbodson/bibl>>).
- (2005), 'Naming the Exotic Animals in Ancient Greek and Latin', in A. Minelli, G. Ortalli and G. Sanga (eds.), *Animal Names*, Venice, Istituto Veneto di Scienze, Lettere ed Arti, 453-80
(online <<http://www.promethee.philo.ulg.ac.be/zoologica/lbodson/bibl>>).
- (2008), '[*Ousia*] ARISTOTE, *Génération des animaux, Marche des animaux, Mouvement des animaux, Parties des animaux*', in A. Motte, P. Somville et al. (eds.), *OUSIA dans la philosophie grecque des origines à Aristote*, Louvain-la-Neuve, Paris and Dudley (MA), Peeters, 263-328
(online <<http://www.promethee.philo.ulg.ac.be/zoologica/lbodson/bibl>>).
- (2009), *L'interprétation des noms grecs et latins d'animaux illustrée par le cas du zoonyme sêps/seps*, Brussels, Académie royale de Belgique.
- (2012), 'Introduction au système de nomination des serpents en grec ancien : l'ophionyme *dipsas* et ses synonymes', *Anthropozoologica* 47/1, 73-155 (online <<http://www.promethee.philo.ulg.ac.be/zoologica/lbodson/bibl>>).
- Cam, M.-T. (ed.) (2007), *La médecine vétérinaire antique. Sources écrites, archéologiques, iconographiques. Actes du colloque international de Brest, 9-11 septembre 2004, Université de Bretagne occidentale*, Rennes, Presses universitaires de Rennes.
- Capponi, F. (1979), *Ornithologia Latina*, Genoa, Università di Genova, Istituto di Filologia classica e medievale.
- Dalby, A. (2003), *Food in the Ancient World from A to Z*, London and New York, Routledge.
- Davies, M. and J. Kathirithamby (1986), *Greek Insects*, London, Duckworth.
- Delorme, J. and C. Roux (1987), *Guide illustré de la faune aquatique dans l'art grec*, Drawings: P. Opic, Juan-les-Pins, Association pour la promotion et la diffusion des connaissances archéologiques.
- De Saint-Denis, E. (1947), *Le vocabulaire des animaux marins en latin classique*, Paris, Klincksieck.
- Dierauer, U. (1977), *Tier und Mensch im Denken der Antike. Studien zur Tierpsychologie, Anthropologie und Ethik*, Amsterdam, B.R. Grüner.

- Dübner, F. (1843, reprint: 1877), *Scholia Graeca in Aristophanem*, Paris, Firmin-Didot.
- Egerton, F.N. (2012), *Roots of Ecology. Antiquity to Haeckel*, Berkeley and Los Angeles, University of California Press.
- Eichinger, W. (2005), *Der Bär und seine Darstellung in der Antike*, Hamburg, Dr. Kovač.
- Engels, D. (1999), *Classical Cats. The Rise and Fall of the Sacred Cat*, London and New York, Routledge.
- Feldbusch, M. (1976), *Der Brief Alexanders an Aristoteles über die Wunder Indiens*, Synoptische Edition, Meisenheim am Glan, A. Hain.
- Garofalo, I. (1991), 'The Six Classes of Animals in Galen', in J.A. López Férez (ed.), *Galeno: Obra, Pensamiento e Influencia. Coloquio internacional celebrado en Madrid, 22-25 de Marzo de 1988*, Madrid, Univ. Nacional de Educación a Distancia, 73-87.
- (2009), 'Galeno, egli animali e la veterinaria', in V. Ortoleva and M.R. Petringa (eds.), *La Veterinaria Antica e Medievale: Testi Greci, Latini, Arabi e Romani. Atti del II Convegno Internazionale Catania, 3-5 Ottobre 2007*, Lugano, Lumières internationales, 27-35.
- Guasparri, A. (2008), 'Biologia e Nomenclatura in Plinio', *Annali Online di Ferrare Lettere* 3/1, 111-23.
- International Code of Zoological Nomenclature* (1999), 4th edition, London, The International Trust for Zoological Nomenclature, c/o The Natural History Museum (<<http://www.nhm.ac.uk/hosted-sites/iczn/code/fin>>, accessed: 25/08/2010).
- || p. 577 Jacoby, F. (1958), *Die Fragmente der griechischen Historiker, III.C1*, Leiden, E.J. Brill.
- Jashemski, W.F. and F.G. Meyer (eds.) (2002), *The Natural History of Pompeii*, Cambridge, Cambridge University Press.
- Jennison, G. (1937), *Animals for Show and Pleasure in Ancient Rome*, Manchester, Manchester University Press.
- Kassel, R. and C. Austin (1991), *Poetae Comici Graeci. II. Agathenor–Aristonymus*, Berlin and New York: Walter de Gruyter.
- (2001), *Poetae Comici Graeci. I. Comoedia Dorica, Mimi, Phlyaces*, Berlin and New York, Walter de Gruyter.
- Keller, O. (1887), *Thiere des classischen Alterthums in culturgeschichtlicher Beziehung*, Innsbruck, Wagner.
- (1909-13), *Die antike Tierwelt*, two volumes, Leipzig, J. Cramer.
- Kinzelbach, R. (2009), *Tierbilder aus dem ersten Jahrhundert. Ein zoologischer Kommentar zum Artemidor-Papyrus*, Berlin and New York, Walter de Gruyter.
- (2012), 'A Cassowary *Casuarius casuarius* (Linnaeus, 1758) Record from Alexandria, Egypt, in 20 B.C. (Aves, Ratitae, Casuaridae)', *The Open Ornithology Journal* 5, 26-31.
- Kotjabopoulou E., Y. Hamilakis, P. Halstead, C. Gamble and P. Elefanti (eds.) (2003), *Zooarchaeology in Greece. Recent Advances*, Athens, The British School at Athens.
- Lacroix, L. (1937a), *La faune marine dans la décoration des plats à poissons. Étude sur la céramique grecque d'Italie méridionale*, Verviers, Lacroix.
- (1937b), 'Noms de poissons et noms d'oiseaux en grec ancien', *L'Antiquité classique* 6, 265-302.

- Lazaris, S. (2010), *Art et science vétérinaire à Byzance. Formes et fonctions de l'image hippiatrice*, Turnhout, Brepols.
- Lenz, H.O. (1856), *Zoologie der alten Griechen und Römer, deutsch in Auszügen aus deren Schriften, nebst Anmerkungen*, Gotha, Becker.
- Li Causi, P. (2003), *Sulle tracce del mantichora. La zoologia dei confini del mondo in Grecia e a Roma*, Palermo, Palumbo.
- (2008), *Generare in comune. Teorie e rappresentazioni dell'ibrido nel sapere zoologico dei Greci e dei Romani*, Palermo, Palumbo.
- Lindsay, W.M. (1913), *Sexti Pompei Festi De verborum significatu quae supersunt cum Pauli epitome*, Stuttgart and Leipzig, B.G. Teubner.
- Louis, P. (1971), 'Animaux anonymes chez Aristote', *Bulletin de l'Association Guillaume Budé*, 211-7.
- Lunczer, C. (2009), *Vögel in der griechischen Antike. Eine Untersuchung über Kenntnisse und Wahrnehmung der antiken Vögelwelt*, PhD, Heidelberg, Ruprecht-Karls-Universität.
- MacKinnon, M. (2004), *Production and Consumption of Animals in Roman Italy: Integrating the Zooarchaeological and Textual Evidence*, Portsmouth, RI, Journal of Roman Archaeology.
- McDermott, W.C. (1938), *The Ape in Antiquity*, Baltimore, The Johns Hopkins Press.
- McPhee, I. and A.D. Trendall (1987), *Greek Red-figured Fish-plates*, Basel, c/o Archäologisches Seminar der Universität (*Antike Kunst*, Supplement 14).
- McPhee, I. and A.D. Trendall (1990), 'Addenda to *Greek Red-figured Fish-plates*', *Antike Kunst* 33: 31-51.
- Minelli, A. and G. Fusco (2012), 'Classification', *eLS [= explore Life Sciences]*, Chichester, John Wiley and Sons, DOI: 10.1002/9780470015902.a0001519.pub3.
- Morel, W. (1927), *Fragmenta poetarum Latinorum epicorum et lyricorum*, Leipzig, B.G. Teubner.
- || p. 578 Newmyer, S.T. (2007), 'Animals in Ancient Philosophy: Conceptions and Misconceptions', in L. Kalof (ed.), *A Cultural History of Animals in Antiquity*, Oxford and New York, Berg, 151-74.
- Olson, S.D. and A. Sens (2000), *Archestratos of Gela. Greek Culture and Cuisine in the Fourth Century BCE. Text, Translation, and Commentary*, Oxford, Oxford University Press.
- Ortoleva, V. and M.R. Petringa (eds.) (2009), *La veterinaria Antica e Medievale. Testi Greci, Latini, Arabi e Romani. Atti del II Convegno internazionale Catania, 3-5 Ottobre 2007*, Lugano, Lumières internationales.
- Oxford English Dictionary* (2011), online edition <<http://www.oed.com>>.
- Page, D.L. (1962), *Poetae Melici Graeci*, Oxford, Clarendon Press.
- Peurière, Y. (2003), *La pêche et les poissons dans la littérature latine. I. Des origines à la fin de la période augustéenne*, Brussels, Latomus.
- Pollard, J. (1977), *Birds in Greek Life and Myth*, London, Thames and Hudson.
- Radt, S. (1977), *Tragicorum Graecorum Fragmenta, IV. Sophocles*, Göttingen, Vandenhoeck and Ruprecht.
- Richter, G.M.A. (1930), *The Metropolitan Museum of Art. Animals in Greek Sculpture. A Survey*, New York, Oxford University Press.
- Rocca, J. (2008), 'Anatomy', in R.J. Hankinson (ed.), *The Cambridge Companion to Galen*, Cambridge, Cambridge University Press, 242-62.
- Rochette, B. (2005), 'Die Übersetzung von Fachbegriffen bei Apuleius', in T. Fögen (ed.), *Antike Fachtexte. Ancient Technical Texts*, Berlin and New York, Walter de Gruyter, 289-317.

- Saint-Denis, de: see above De Saint-Denis.
- Scullard, H.H. (1974), *The Elephant in the Greek and Roman World*, London, Thames and Hudson.
- Sorabji, R. (1993), *Animal Minds and Human Morals. The Origins of the Western Debate*, London, Duckworth.
- Strömberg, R. (1943), *Studien zur Etymologie und Bildung der griechischen Fischnamen*, Göteborg, Elanders.
- Thompson, D'A.W. (1936), *A Glossary of Greek Birds* (new edition), London, Oxford University Press and Humphrey Milford.
- (1947), *A Glossary of Greek Fishes*, London, Oxford University Press and Geoffrey Cumberlege.
- Toynbee, J.M.C. (1973), *Animals in Roman Life and Art*, London, Thames and Hudson (reprint: 1996, Baltimore, MD, and London, The Johns Hopkins University Press).
- Van der Meer, L.B. (1987), *The Bronze Liver of Piacenza: Analysis of a Polytheistic Structure*, Amsterdam, J.C. Gieben.
- Voultziadou, E.G. and A.P. Tatolas (2005), *Ta zōa stēn homērikē epochē [The Animals in the Age of Homer]*, Thessaloniki, Erōdios.
- Wehrli, F. (1969), *Die Schule des Aristoteles. Texte und Kommentar, III. Klearchos* (2nd edition), Basel and Stuttgart, Schwabe.
- Wellmann, M. (1908), *Philumeni De venenatis animalibus eorumque remediis*, Leipzig and Berlin, B.G. Teubner.
- West, M.L. (1989), *Iambi et elegi Graeci ante Alexandrum cantati. I. Archilochus, Hipponax, Theognidea* (2nd edition), Oxford, Clarendon Press.
- Zamboni, A. (2005), 'Contact and Substitution. Introductory Remarks', in A. Minelli, G. Ortalli and G. Sanga (eds.), *Animal Names*, Venice, Istituto Veneto di Scienze, Lettere ed Arti, 441-52.