The Neades of the Island of Samos (Greece, Eastern Aegean): An Analysis of Speculative Reconstruction on the Mysterious Beasts described in an Ancient Greek Myth

By Carlo Canna

Abstract

An ancient Greek myth tells of wild and dangerous creatures of gigantic size that in primordial times populated the island of Samos. It is said that the bones of these beasts, known as Neades, emerged from the soil and their 'roar' was so powerful that it could split the earth. The information we have about these fantastic monsters comes from scarce written sources by classical authors. At the same time, no known iconographic evidence depicting these creatures has been discovered. Therefore, it is difficult to understand how the ancient Greeks imagined these Neades. This article aims to provide a speculative reconstruction using geo-mythological methodology, drawing from the research conducted by Mayor and Solounias. This reconstruction will cross-reference the ancient literary sources with the paleontological evidence of megafauna discovered on Samos and known ancient zoological knowledge. This article will demonstrate that in ancient times the Neades might have been imagined as either elephants (or creatures similar to these animals) or as gigantic beasts similar to hyenas (especially striped hyenas).

1. Introduction

An ancient Greek myth tells of wild and dangerous creatures of gigantic size that in primordial times populated the island of Samos, in the eastern Aegean. Their 'roar' was so powerful that it could split the earth and their huge bones emerged from the soil. These beasts were known as Neades.[1]

[1]The word Neades/Neides (*νηάδες/νήϊδες*) likely translates in this context as 'murky' (Boardman 2004, 32).

It is interesting to note that across various cultural contexts, islands are often depicted as places that were populated by monsters and unsettling presences—a fact that that can sometimes be interpreted by the existing archaeological and anthropological evidence on these islands.[2] In Greek mythology, in particular, there is no shortage of examples of frightening creatures dwelling on an island, from characters in the Homeric poems to the Minotaur, or the Neades themselves.

The Neades are recorded in scarce written sources by classical authors.[3] To date, there is no known evidence within the iconographic documentation which represents what these creatures might have looked like. Therefore, it is difficult to understand how the ancient Greeks imagined these Neades. This article aims to provide a speculative reconstruction using a geomythological methodology, drawing from the research conducted by Mayor and Solounias: the bones of prehistoric mammals hidden within the island's soil were connected with the Neades and their deafening 'roar' was associated with the noise of earthquakes that periodically struck the island.[4]

The Mediterranean is a region of high seismic and volcanic activity, and several classical authors report in ancient sources the discovery of giant bones following earthquakes (or other natural events), which were attributed to the remains of Giants, heroes, and monsters in Greece

[2] Cauvin noted the contrast between the persistence of massive circular stone houses in the Neolithic villages of the Khirokitia culture in Cyprus and the level of socio-economic development achieved by those communities, also taking into account the absence of any trace of weapon-making. This is a defensive mechanism typical of island communities, already highlighted by other scholars cited by Cauvin, such as Le Brun for Khirokitia and, more generally, Evans concerning the tendency of protohistoric insular or maritime communities to enclose themselves within massive constructions and to insist on megalithism. In conclusion, Cauvin interprets the data from Khirokitia advancing the hypothesis that this defensive mechanism may have been conceived in ancient times as an effective tool for countering "mythical" dangers that are difficult for us to perceive (Cf. Cauvin 1994, 231-233). In the Haida society of the Queen Charlotte Islands archipelago (British Columbia, Canada) the village houses were arranged so that the front and the entrance faced the sea, a source of survival, and the back faced the impenetrable forest believed to be inhabited by malevolent spirits and witches. Moreover, the windows facing the forest, unlike those facing the sea, were protected by curtains or screens in order to ensure protection from these evil entities (Tiberini 1990, 30).

[3] A reference to the classical authors is provided in Fozio/*Suda* under the name Naides (Phot. 298.7-10 Porson-=*Suid*. ν 306 Adler). For further information: Magnelli (1999, 55-58).

[4] Cf. Mayor 2000, 54-61; Solounias and Mayor 2004 and Solounias 2024, Chapter 1. On the various studies conducted on this myth since the early 20th century and on the history of paleontological excavations carried out at Samos in modern times starting from the mid-19th century: Solounias 2024, Chapter 1.

and in the Mediterranean more broadly.[5] Modern geomythological research has identified these remains as fossils of large mammals from the Miocene, Pliocene, and Pleistocene epochs.[6]

Ancient Greece, therefore, is a fundamental cultural context for this interdisciplinary study which, building on the aforementioned research, cross-references data from ancient written sources with paleontological evidence of the megafauna of Samos and with ancient zoological knowledge.[7]

2. From Cultural Context to Geomythology

2.1. The Cultural Context: Ancient Greece

Having moved beyond the reductive Jungian view that interprets myth merely as an expression of timeless structures of the human psyche, a growing number of scholars now support the idea that myths may also conceal elements of historical truth.[8]

[5] Philostratus (*Her.*): Vinedresser: [8.3] Indeed, if I were versed in legendary lore, I would describe the seven-cubit-long corpse of Orestes, which the Lacedaemonians found in Tegea, as well as that corpse inside the bronze Lydian horse, which had been buried in Lydia before the time of Gyges. When the earth was split by an earthquake, the marvel was observed by Lydian shepherds with whom Gyges then served. The corpse, appearing larger than human, had been laid in a hollow horse that had openings on either side. [8.9] (...) When Hymnaios happened to dig up vines on the island of Ikos (...) the earth sounded somewhat hollow to those who were digging. When they opened it up, they found a twelve-cubit corpse lying there with a serpent inhabiting its skull. [8.11] But the corpse that came to light on Lemnos, which Menekratês of Steiria found, was very big, and I saw it a year ago when I sailed from Imbros, only a short distance from Lemnos, however, no longer appear in their proper order: the vertebrae lie separated from each other, tossed about by earthquakes, I suppose, and the ribs are wrenched out of the vertebrae. But if one imagines the bones together as a whole, the size seems to make one shudder and is not easily described (...). [Transl. E. Bradshaw Aitken and J.K. Berenson Maclean].

[6] For further discussion, see Mayor 2000.

[7] On the reconstruction of the morphotype of mythical creatures, I believe it fitting to mention the studies conducted by Li Causi (2017; 2025) on the construction of morphotypes and cognitive types of imaginary or unfamiliar animals in Greek and Roman antiquity. However, it is a different approach from the one proposed in this research, which cannot consider a possible zoological identification of the Neades, as taken into consideration in the conclusions of the present article.

[8] "One can hardly assume that myth or mystery was consciously invented for some purpose: everything suggests rather that they represent an involuntary recognition of an unconscious psychic precondition" (Jung 1997, IX.1.183). Cf. also Versnel 1994 and Bremmer 2014.

The most prominent examples come from the classical world, specifically Greek mythology, due to the richness of archaeological data and the earliest written sources by Hesiod and Homer.

According to Boardman, unlike other ancient cultures which were characterized by a long tradition of historical and archaeological documentation—often sustained over centuries by dynastic or religious continuity—the Greeks of the historical period had to reinvent their past, which had been disrupted by the collapse of the Bronze Age civilizations of Crete and Mycenae. The cultural legacy preserved through oral tradition was combined with efforts to identify, through a mytho-historical lens, the locations and deeds of figures from their heroic past (the Bronze Age). Both the natural and the man-made worlds (fossils, landscape features, ruins and relics) may have been responsible for this reconstruction of the past.[9]

Within this specific cultural framework, the research conducted by various scholars—especially Mayor—plays a significant role. Through a thorough and thought-provoking investigation, she has provided the most comprehensive documentation of the connection between myths and legends of Giants, heroes, and monsters in Greek mythology and the discovery of fossil remains of large vertebrates.[10]

2.2. Geomythology

'Geomythology', a term coined by Vitaliano, is the study of geological phenomena as interpreted through myth and folklore by prescientific cultures.[11]

When interpreting the geological content of a myth, it is important to distinguish between general cases—where objective verification is not possible—and more specific ones that are strongly tied to particular territories, such as sacred sites or emotionally impactful geological events, like volcanic eruptions and earthquakes.[12] Among natural objects (such as unusually

[9] Boardman 2004.
[10] Mayor 2000.
[11] Vitaliano 1968; 1973.
[12] Cf. Piccardi 2002.

shaped rock formations, gemstones, meteorites, etc.), fossils have particularly sparked human curiosity, inspiring numerous speculations about their origin and meaning.[13] The list of examples is extensive, but the fossils that likely had the greatest influence on the collective imagination of ancient cultures—especially in ancient Greece—are the large bones of prehistoric vertebrates, which were often directly interpreted as the physical remains of mythological beings: Giants, heroes, and monsters.

In the history of speculative reconstructions of mythological monsters through a geo-mythological study approach, one of the best-known early examples is Abel's theory of Polyphemus who suggested that there may have been a relationship between the large nasal cavity located in the centre of the skull of Palaeoloxodon falconeri (a prehistoric species of 'dwarf' elephant whose fossil remains have been found in Sicily and Malta) and the eye of the Homeric Cyclops.[14] One of the most acclaimed theories is that of the griffin (a creature combining features of lions and birds): Mayor suggests that there was a possible relationship between the fossil remains of the Protoceratops, a Central Asian horned dinosaur of the Cretaceous period (ca. 100-65 million years ago), with the morphology of this legendary creature.[15]

[13] For further reading on Geomythology and fossils cf. also: Vitaliano 1973; Mayor 2000, 2005a-b and 2025; Piccardi and Masse 2007.
[14] Abel 1942, 55-56. For further information on Cyclops and fossils in the Mediterranean islands: Masseti 2008, 10-11.
[15] Mayor 2000, 15-53.

3. A Speculative Reconstruction of the Neades: Insights from Classical Texts, Fossil Evidence, and Ancient Zoology

3.1 Ancient written sources

Our information about the fantastic monsters of Samos whose roar tore the earth primarily comes from Euagon (fifth century BC), Aristotle (fourth century BC), Euphorion (third century BC), Plutarch (first-second century AD), and Aelian (second-third century AD).[16]

The most complete written source on the Neades is a fragment from a lost work by the Greek geographer Euphorion, as reported by the natural historian Aelian (*De Natura Animalium* 17.28):

> Euphorion says in his memoirs that during the very old times, Samos became deserted; deserted due to very large and fierce beasts which appeared on it, they caused sufferings [they were awe-inspiring] [two possibilities for the word *deina*] and were called Neades, and their mere roar could fracture the earth. Thus, there is a proverb on Samos: 'to scream louder than the Neades'. The same writer [Euphorion] says that their big bones for years and now are displayed.[17] [Transl. Solounias and Mayor 2004].

In their interpretation of the text from this source, Solounias and Mayor believe that in ancient times the Neades were considered responsible for the extermination of the entire population of Samos and classified these beasts as 'wild mammals'.[18] Euphorion's proverb, 'to scream

[16] Cf. Mayor 2000, 54-60; Solounias and Mayor 2004, 284-293. It should be clarified that the source cited by Plutarch actually refers to a different myth, which tells of creatures (identifiable as the elephants of Dionysus) described as the beasts sometimes called Neades in earlier sources (see below).

[17] Ael. *De natura animalium* 17.28 cf. Scholfield (1958, 359) in Solounias and Mayor 2004, 285-286; cf. also Solounias 2024, 12.

[18] In modern Samian folklore, there remains a recognition of a natural catastrophe that led to the disappearance of the island's entire population—likely attributable to a single major earthquake that lies at the origin of these myths. For further reading, cf. Solounias and Mayor 2004, 286, 293; Solounias 2024, 12, 20.
Regarding historical and archaeological data on earthquakes in ancient Samos: Papadimitriou et al (2020, 255) trace the earliest historical evidence back to the second century BC (around 201-197 BC, when an earthquake caused injuries among the people of the island of Samos); Sassu (2013, 258) reports the collapse of the Heraion (Temple of Hera in Samos) in the sixth century BC due to the failure of the foundations in the eastern half of the building, caused by marshy ground and weak substructures.
On the possible identification of the Neades as 'wild mammals', Solounias and Mayor (2004, 286) write: "*Theria* means wild animals or beasts. It can also mean fierce. 'Wild mammals' is the preferred translation".

louder than the Neades', is also documented in Aristotle with political connotations and, likely, in Callimachus for poetic purposes.[19]

The oldest reference to giant beasts whose roar tore the earth in Samos comes from a fifth-century BC fragment by Euagon, cited by Plutarch:

> at the location called Phloios the very earth cracked open and collapsed upon [some] huge beasts as they uttered great and piercing cries. [20]

A similar description of such creatures can be found in Plutarch's *Greek Questions*, although it belongs to a different myth that tells of an epic battle held in Samos between the god Dionysus and the Amazons:

> What is the reason that on Samos there is a region called Panaima [all bloody place or bloodbath]? The answer is the Amazons, fleeing from Dionysus, fell [or were trapped] on Samos [fleeing] from the land of the people of Ephesos. Dionysus constructed ships, passed [from the mainland to Samos] and fought the Amazons, killing most of them, in various locations [on Samos]. Such a vast amount of blood spilled that people who noticed the red-stained earth called the place by the name Panaima. Some of the...phi...[later added as elephants] died near the place called Phloios and their bones can still be seen there. Some say that they fractured Phloios because of their prodigious bellowing.[21] [Transl. Solounias and Mayor 2014].

In Plutarch's reference to the creatures whose 'prodigious bellowing' split the earth at Phloios and whose bones were displayed, one can find a clear connection to the historical sources previously mentioned by other classical authors. This observation provides an additional

[19] On the association of this proverb with the roar that accompanies an earthquake and Aristotle: Mayor 2000, 57-58 and n. 3, 290; Solounias and Mayor 2004, 292. Aristotle (or one of his students) on the Neades: "It is said that in the beginning, Samos was lonely and contained a number of animals with a loud cry. The animals were called Neides" (*Heraclidis Lembi* 30 in Dilts 1971, 24-25). Magnelli (1999, 55-58) suggests that the poet Callimachus may have been familiar with the myth of the Neades and, in the prologue of the Telchines (*Aitia*, fr. 1 Pf.), he specifically compares the 'croaking' of the Telchines—detractors of his poetry—to the loudness of the Neades: "The Telchines grumble at my poetry, ignorant, they weren't born friends of the Muse".

[20] Solounias and Mayor 2004, 292 and Solounias 2024, 19 (Plutarch in Halliday 1928). "(...) earth cracked open and collapsed upon huge beasts. This scenario can be interpreted as the ancient recognition that huge beasts once lived near Phloios where they were destroyed by an earthquake" (*ibid*.).

[21] Plut. *Quaestiones graecae,* 56 cf. Halliday/Clarendon Press (1928, 233) in Solounias and Mayor 2004, 287; cf. also Solounias 2024, 14.

insight into a possible identification of the Neades by the ancients and in Plutarch's description of these creatures. It is worth mentioning what Solounias and Mayor have observed: "(...) The emendation of the word elephants was based on the presence of the *phi* and was added by Wilanowitz-Mollendorff and affirmed by subsequent scholars" [...] "the word elephant is plausible because Plutarch was referring to a well-known myth of Dionysus' war elephant, in which the god used to defeat the Amazons (...). Because it features elephants, we know that this myth arose sometimes after [...] Alexander the Great's conquests in India".[22]

The indirect reference to Dionysus' elephants can be interpreted as a potential recognition by the ancients of mastodon fossils as the bones of the god's elephants that had fallen in battle against the Amazons.[23]

3.2 Paleontological Documentation

The historical sources cited, ranging from Euagon to Aelian, represent some of the earliest European examples of interpreting fossil remains of large vertebrates.[24] The bone beds of Samos were accumulated near fault zones, a fact that can be seen in the association between the Neades (the fossil remains) and their roars (earthquakes and ground fractures), as well as in the identification of the two 'geonyms' Phloios and Panaima.[25] The paleontological record of Samos has yielded a rich Late Miocene fauna similar to the present-day African savanna but more abundant and diverse, including several species of giraffes, rhinoceroses, hipparions, hyenas, proboscideans, and many more. The most common fossils are ungulate mammals such as hippotheria, rhinoceroses, the giraffid Samotherium, antelopes, and other large mammals of

[22] Mayor 2000, 56 and n.1, 289; Solounias and Mayor 2004, 287-288, 290-291; Solounias 2024, 15-17.
[23] Mayor 2000, 55; Solounias and Mayor 2004, 288 and Solounias 2024, 15-17. For more information on the interpretation of this geomyth and the identification of these creatures: cf. Mayor 2000, 54-55; Solounias and Mayor 2004, 287-292; Solounias 2024, 14-19.
[24] Solounias 2024, 11.
[25] Major excavations sites are near Phloios (Quarry 1) and Panaima (Quarry 5) in the Mytilini Basin: Phloios ('thick and hard crust' in Greek) is a big block of faulted limestone (The Pythagoras Fault) next to Quarry 1; Panaima ('bloodbath' in Greek) is a small red plateau located near Quarry 5. Cf. Solounias and Mayor 2004; Solounias and Ring 2007 and Solounias 2024.

the Miocene epoch.[26] By observing the fossil remains (probably skulls and teeth), the ancients could distinguish the more unusual ones from the bones of domestic animals, correctly identifying them as the remains of 'wild beasts'.[27]

It is likely that the bone beds of Samos, which have not been documented with drawings or pictures, were very similar to the bone beds of Gansu in central China: a huge accumulation of skeletons and isolated bones of different animals (Figure 1).[28] This suggests a possible identification of the Neades by the ancients based on fossil remains of animals belonging to various taxa. We cannot exclude the possibility that the Neades were reconstructed as either real or fantastic animals based on the observation of unusual and/or common fossil remains found in the bone beds of Samos (Figure 2). However, this remains a hypothesis that cannot be further explored with the data currently available from the sources at our disposal.

The description of the Neades as enormous beasts that split the earth with their screams is a fact that must necessarily be related to the larger mammals found in the late Miocene megafauna of Samos: among these, in particular, the huge skulls of rhinoceroses (Figure 3 **&**Figure 4) and proboscideans (Figure 5 **&** Figure 6) were probably the most easily associated with the remains of gigantic beasts, possessing jaws powerful enough to cause earthquakes.[29]

[26] Solounias and Ring 2007, 11 and Solounias 2024, 7. Among the most common mammals in Samos: Hyaenidae, Orycteropididae, Porcaviidae (Pliohryax), Equidae (hipparion skulls), Rihinocerontidae (Chilotherium), Giraffidae (Samotherium, Paleotragus), Bovidae (Miotragocerus, Samokeros), Antilopini (Gazella), Ovibovini (Palaeoryx); cf. also Solounias 2024, 96-99, 262-265.

[27] This is an interpretation of Euphorion's text with a possible translation of the term *theria* as 'wild mammals' (cf. *supra* fn. 18).

[28] Solounias 2024, 39-41, Fig. 122-125.

[29] Of particular interest is the discovery, in the Temple of Hera (Heraion), of a fossil femur belonging to a Miocene rhinoceros, datable to around the seventh century BC (Mayor 2000, 182-183; Solounias 2024, 14, 21). In particular, in ancient times, the teeth (premolars and molars) of proboscideans discovered in Samos (deinotheres and mastodons) may have been more easily identified with those of carnivorous animals. Indeed, up to the 19th century, in several instances those prehistorical creatures were identified as monstrous carnivorous animals (cf. Semonin 2000 and Garbin 2016, 246-252). Therefore, in the past, when fossil remains belonging to the head (mostly fragments of cranium, jaws and teeth) of proboscideans were discovered in Samos, they were probably associated to the remains of enormous carnivores.

Finally, from the possible reference to Dionysus' war elephants that died at Phloios to the modern Samian folklore identifying the fossil beds as an elephant cemetery, these data indicate that these animals have long played a role in the collective imagination of the people.[30]

3.3 Ancient Zoology

According to Solounias, the largest mammals known to the ancient Greeks were the cow and the horse, but they may also have known of elephants.[31]

Many classical authors, especially in the earliest sources, describe the elephant as a wondrous creature: from the *wild beast* of Herodotus (4.191), to the only animal capable of confronting the legendary manticore described by Ctesias (*Ind*. 7), or the *very large and very voracious animal* mentioned by Plato (*Crito* 2.4e). For Juba II (son of Juba of Numidia), the tusks were horns, not teeth—a characteristic later echoed by other authors such as Aretaeus of Cappadocia (*De causis et signis diuturnorum morborum, Liber Secundus,* XIII), who described the elephant as having a *dark skin, like the night and death*.[32] However, there are also very precise observations of this animal from Aristotle (*Part. an.; Hist. an.; IA; Gen.an.*) to later authors, such as Pliny (*HN* 8.1-13) and Aretaeus himself.[33]

From Plutarch's possible reference to Dionysus' elephants to the earliest sources recounting huge and fierce beasts sometimes called Neades, it is possible that these mythological creatures were identified in antiquity as elephants or animals similar to them (Figure 7 & Figure 11 in the front cover).

[30] Solounias 2024, 14, 17,19.
[31] Solounias 2024, 13.
[32] Scullard 1974. These ancient sources provide a mythical aura to such exotic animals as elephants.
[33] Scullard 1974, 37-48, 209, 221. Aretaeus (*De causis et signis diuturnorum morborum, Liber Secundus,* XIII cf. T.F. Reynolds 1837, 151), for example, provides a detailed description of the skin of these animals: It has a rough and very thick skin, containing fissures with prominent edges, long channels, and other hollow clefts, some transverse, others oblique, very deep, in all respects like a furrowed field. Iconographic evidence from the Hellenistic period to the end of the Roman era generally presents a realistic image of this animal (cf. Scullard 1974; Karahan and Tülek 2023).

Elephants, like the Neades, are described as enormous beasts and symbolize loudness.[34] Even Edward Topsell, although citing no specific evidence, suggested this identification for the Neades in his *The historie of foure footed beasts* (1607):

> "(...) and this title [Of the Neades, Neides, or Naides] I thought good to insert into this History, leaving the Reader to consider, whether he will take them for Elephants, or for any other greater beast; for my opinion if it be desired, I think them rather (if there ever were any such) that they were Elephants of greature stature then ever since were seen, and not any generations of beasts now lost and utterly perished".[35]

Excluding the hypothesis of the elephantine Nead, it is possible to consider another speculative reconstruction based on an indirect interpretation of the proverb 'to scream louder than the Neades', as a possible association between the Neades' sound and the human voice.[36] According to Li Causi, in ancient times, the *sermo humanus* was attributed to various animals: some species of birds, the legendary manticore and the hyena (in its 'variants' hyaina, corocotta and leucrocotta); the hyena, in particular, is described as a fierce beast and a magical and mysterious animal that assumed fantastic traits so as to resemble mythological monsters.[37]

The Hyaenidae family comprises four extant members: the striped hyena (*Hyaena hyaena*, Linnaeus 1758), the spotted hyena (*Crocuta crocuta*, Erxleben 1777), the brown hyena (*Parahyaena brunnea*, Thunberg 1820), and the aardwolf (*Proteles cristatus*, Sparrman 1783).[38]

---

[34] Regarding the size of elephants in ancient sources: cf. Scullard 1974, 47: Excessive bulk, such as has been given (...) in still greater measure to elephants, is sufficient in itself to protect an animal from being destroyed by others (Arist. *Part. an.* 3.2; 663^{a}5); 220: (...) he is the greatest and the thickest of animals; in size, he is as great as if you were to put one animal on top of another, like a tower; in bulk, he is as large as if you should place several other very large animals side by side. But neither in shape is he much like to any other (Aretaeus of Cappadocia); 209: the largest land animal (Plin. *HN* 8.1). On the loudness of elephants in ancient sources: cf. Scullard 1974, 45: (...) the sound produced is like that of a hoarse trumpet (Arist. *Hist. an.* 4.9; 536^{b}22); 227: And the elephants bending their trunk inward and folding it beneath their tusks, like the ram of a ship driving along with a great surge, fall upon the men in a tremendous charge, overturning many and bellowing with a piercing shrill note like a trumpet (Ael. 8.10); 102: the huge earth-shaking beast (a roman ballad poetry which Macaulay attributed to Capys).

[35] Topsell 1607, 567.

[36] A similar case is that of an ancient legend told by the Latin poet Rutilius Namatianus in the fifth century AD (*De reditu suo* vv. 255 ss.): a deity in the form of a bull scraped the soil and caused a source of water with beneficial properties to spring form the earth. Such legend has been interpreted as a possible indirect reference to the use of thermal water to heal the animals in ancient times (Bassani 2012, 193).

[37] Li Causi 2003, 232-237 and 2018, 225.

[38] Mills and Hofer 1998.

In Greco-Roman antiquity, the only species of hyena that would have been observed by historians, travellers or naturalists were the striped and the spotted hyenas.[39] Striped and spotted hyenas have a different historical distribution. Striped hyenas, unlike spotted hyenas, are present in Northern Africa, Western Asia, and India; in particular, the presence of the striped hyena is well documented until the first decades of the second half of the twentieth century, in the extreme western part of Turkey, an area (the Aegean Region, in particular) close to the island of Samos.[40]

The oldest historical sources on the hyena are reported between the fifth and fourth century BC by Herodotus (4.192), Ctesias (*Ind.* fr. 76) and Aristotle (*Hist. an.* 6.32 and 8.5*; Gen.an.* 3.6); on the hyena's capability to imitate the human speech, wrote Ctesias (*Ind.* fr. 76), Agatarchides (*On the Erythraean Sea* fr. 78a), Diodorus Siculus (*Bibliotheca historica* 3.37.10), Pliny (*HN* 8.44, 106), Aelian (7.22) and Solinus (*Collectonea rerum memorabilium* 27.23-26).[41] The striped hyena was mentioned by Herodotus (4.192) already in the fifth century BC and, later on, the most detailed description was provided by Aristotle (*Hist. an.* 6.32 and 8.5*; Gen.an.* 3.6). Such data can be related to the geographical distribution of that species.[42] One of the most detailed ancient depictions of a hyena is the one by the famous Nile mosaic from Palestrina (c. 120 BC). The animal, portrayed as a big and robust dog, with horizontal instead of vertical stripes, has been identified with a striped hyena (*Hyaena hyaena*, Linnaeus 1758);

[39] Funk 2012, 145-146.

[40] Mills and Hofer 1998, 44, 55. Kasparek *et al.* 2013, 96-98, Fig. 6, 104.

[41] Cf. Li Causi 2003 and Funk 2012. In particular, with reference to hyenas' ability to imitate the human voice, it is a characteristic which we may associate to the notorious cries of the spotted hyena; yet the analysis of the sources does not allow for a zoological identification (cf. Funk 2012, 155).

[42] Cf. Mills and Hofer 1998, 44, 55 and Funk 2012, 146. Aristotle's description refers to this species for morphological characters and geographical distribution: Arist. *Hist. an.* 6.28 and 8.7 cf. Cresswell (1883, 176): The hyaena is of the colour of the wolf, but it is hairier, and has a mane along the ridge of its back (...). The animal which some persons call the glanus and others the hyaena, is not less than the wolf, it has a mane like a horse, but the hair all along its spine is harsher and thicker (...). In particular, the mane along the entire back is a distinctive character of the striped hyena also reported in Pliny (*HN* 8.105); (Li Causi 2003, 232); Arist. *Mir.* (845a 24 ff.) cf. Dowdall 1909: In Arabia they say there is a certain kind of hyaena (...).

on the other hand, no authentic representations of the spotted hyena have been discovered from antiquity, the Middle Ages or early modern times.[43]

Therefore, it is likely that travellers' records from Samos spread information about such a strange animal, and the morphological features of the striped hyena may have affected the collective imagination of the ancients, shaping the image of Neades as fierce and feral beasts (Figure 8**,** Figure 9 **&** Figure 10).

4. Conclusions

Two hypotheses for the speculative reconstruction of the Neades have been formulated in this paper. The data presented suggest that these beasts may have been visualized in ancient times as elephants, creatures similar to elephants, or enormous beasts comparable to hyenas, especially striped hyenas. The most intuitive reconstruction is that of the Neades as elephants or animals resembling them—large and noisy—although this hypothesis lacks a direct reference to these animals in the written sources. In the second reconstruction, a possible connection between the Neades and the hyena was hypothesized, an animal that the ancients believed possessed the *sermo humanus*, based on an indirect reading of the proverb 'to scream louder than the Neades'. In the ancient world, people believed that living beings from the past were larger than those of the present, a fact that can be related to a medium-sized mammal such as the hyena; yet, with reference to fossil remains, that datum can be especially true for those animals whose history was linked to the one of ancient heroes, like the mythical Calydonian Boar killed by Meleager, whose tusks were originally displayed at Tegea, in Greece, before being transported to Rome by Augustus.[44]

[43] Salari 2006, 38; Funk 2012, 147. Different morphological features that are characteristic of this species can be identified: a black stripe on the back that can be identified as its mane and possible fur clumps or stripes on the right side of its head (both are morphological features that are present in striped hyenas) (Salari pers. com.). Another example of a detailed ancient depiction of a striped hyena is the Ostracon from the Ramesside period in Deir el-Medina (Egypt), which portrays hunting dogs attacking a hyena (Germand and Livet 2001, 95 fig. 108). For other ancient depictions of striped hyenas: Funk 2012, 164 figs. 4-5.

[44] Li Causi 2018, 180-182; Boardman 2004, 32-33. On the tusks of the Calydonian and Erymanthian boars and their identification with the fossil tusks of proboscideans: Mayor 2000, 126, 142-143, 205-206.

Finally, we cannot rule out that the mere discovery of unusual and/or particularly common fossil remains in the bone beds of Samos may have been identified with those of another real animal, or perhaps even a fantastic one; or, more simply, that the Neades might have been imagined as 'spirits' of creatures extinct in a distant past, not attributable to any known animal.

In conclusion, a speculative reconstruction is neither provable nor disprovable and we will probably never know how the ancient Greeks imagined the Neades. However, based on the data available to us, two main interpretative hypotheses have been proposed by cross-referencing historical sources with paleontological evidence and ancient zoological knowledge.

Acknowledgments

I would like to thank Jordon Houston, Panagiotis Kampouridis, George E. Konidaris, Dimitris S. Kostopoulos, Pietro Li Causi, Marco Masseti, Andrea Murace, Luigi Piccardi, Leonardo Salari and Guendalina Daniela Maria Taietti for the information and/or collaboration.

My special thanks go to Emiliano Troco for his artistic reconstruction of Neades and to Adrienne Mayor and Nikos Solounias for the information, collaboration, and friendship. I dedicate this paper to the memory of my father, Romolo Canna, who instilled in me a boundless passion for both the natural sciences and the humanities.

Bibliography

Abel, O. 1942. *Animali del passato*. Milano.

Bassani, M. 2012. "Greggi e mandrie fra termalismo e profezia". *Gerión* 30, 188-193.

Boardman, J. 2004. *Archeologia della Nostalgia*. *Come i Greci reinventarono il loro passato*. Milano.

Bradshaw Aitken, E. and Berenson Maclean, J.K. (with an English translation of), 2002. Flavius Philostratus. *On Heroes*. Atlanta.

Bremmer, J.N. 2014. *Interpretations of Greek Mythology* (Routledge Revivals). London.

Cresswell, R. (with an English translation of), 1883. Aristotle. *History of Animals*. London.

Cauvin, J. 1994. *Nascita delle divinità e nascita dell'agricoltura*. *La rivoluzione dei simboli nel Neolitico.* [Italian translation by M. Fiorini from the original : 1994. *Naissance des divinités. Naissance de l'agriculture : la révolution des symboles au Néolithique*. Paris]. Milano.

Dilts, M.R. (with an English translation of), 1971. *Heraclidis Lembi. Excerpta Politiarum*. *Greek, Roman and Byzantine monographs.* Durham.

Dowdall, L.D. 1909. *The Works of Aristotle. De Mirabilibus Auscultationibus*. Oxford.

Funk, H. 2012. "How the Ancient Krokottas Evolved into the Modern Spotted Hyena Crocuta Crocuta". *Quaderni Urbinati di Cultura Classica* 101, 145-166.

Garbin, E. 2016. *Palæontographica. Il disegno e l'immaginario della vita antica*. Macerata.

Germand, P. and Livet, J. 2001. *Bestiario egizio*. Firenze.

Halliday, W.R. (with an English translation of), 1928. *The Greek questions of Plutarch*. Oxford.

Jung, C.G. 1997. *Opere* vol. 9/1. *Archetipi e inconscio*. Torino.

Kampouridis, P., Svorligkou, G., Kargopoulos, N., Spassov, N., Böhme, M. 2023. "Revision of the Late Miocene hornless rhinocerotids from Samos Island (Greece) with the designation of neotypes and implications for the European chilotheres". *Journal of Vertebrate Paleontology* 43 (1), 1-24.

Karahan, G. and Tülek, F. 2023. "Elephant iconography in the ancient Mediterranean world from the Hellenistic period to the end of the roman period". *International Marmara Social Sciences Congress (Imascon 2023-Autumn) Proceedings Book.* Kocaeli, 49-55.

Kasparek, M., Kasparek, A., Gözcelioğlu, B., Çolak, E., Yiğit, N. 2013. "On the status and distribution of Striped Hyaena, Hyaena hyaena in Turkey". *Zoology in the Middle East* 33, 93-108.

Konidaris, G.E. and Koufos, G.D., 2019. "Late Miocene proboscideans from Samos Island (Greece) revisited: new specimens from old collections". *Palaeontologische Zeitschrift* 93 (1),115-134.

Kostopoulos, D.S. 2009. "The Late Miocene Faunas of the Mytilinii Basin, Samos Island, Greece: New Collection. 13. Giraffidae". *Beitr.Paläont*. 31, 299-343.

Li Causi, P. 2003. Sulle tracce del manticora*. La zoologia dei confini del mondo in Grecia e a Roma*. Palermo.

Li Causi, P. 2017. "From Descriptions to Acts: the Paradoxical Animals of the Ancients from a Cognitive Perspective", in M. Formisano and Ph. van der Eijk (eds.), *Knowledge, Texts and Practice in Ancient Technical Writing*. Cambridge, 252-268.

Li Causi, P. 2018. *Gli animali nel mondo antico*. Bologna.

Li Causi, P. 2025. "There should be Unicorns: Wild Asses of India, Oryges and Other Single-Horned Species in the Zoological Lore of the Greeks and the Romans", in S. Lazaris (ed.), *Identifications des espèces: de l'antiquité à nos jours*. Valenciennes, 101-126.

Mayor, A. 2000. *The first fossil hunters. Paleontology in Greek and Roman times*. Princeton.

Mayor, A. 2005a. "Geomythology", in Selley, R., Cocks, R. and Plimer, I. (eds.), *Encyclopedia of Geology* vol 3. Oxford, 96-100.

Mayor, A. 2005b. *Fossil Legends of the First Americans*. Princeton.

Mayor, A. 2025. *Mythopedia*. *A Brief Compendium of Natural History Lore*. Princeton.

Magnelli, E. 1999. "Quelle bestie dei Telchini (sul v. 2 del prologo degli *Aitia*)". *Zeitschrift fur Papyrologie und Epigraphik* 127, 52-58.

Masseti, M. 2008. "The Most Ancient Explorations of the Mediterranean". *Proceedings of the California Academy of Sciences. Fourth Series* 59, 1-18.

Mills, G. and Hofer, H. (eds.) 1998. *Hyaenas. Status survey and conservation action plan*. Gland.

Papadimitriou, P., Kapetanidis, V., Karakonstantis, A., Spingos, I., Kassaras, I., Sakkas, V., Kouskouna, V., Karatzetzou, A., Pavlou, K., Kaviris, G., and Voulgaris, N. 2020. "First Results on the Mw=6.9 Samos Earthquake of 30 October 2020". *Bulletin of the Geological Society of Greece* 56 (1), 251–279.

Piccardi, L. 2002. "Prolegomeni allo studio scientifico della mitologia, ovvero: note per un turismo geomitologico". *Bollettino FIST-Geoitalia* 10, 23-27.

Piccardi, L. and Masse, W.B. (eds.) 2007. *Myth and Geology*. London.

Reynolds, T.F. (with an English translation of), 1837. Aretaeus of Cappadocia, *On the causes and signs of acute and chronic disease*. London.

Salari, L. 2006. "Mosaico Nilotico di Palestrina: animali reali o fantastici? Archeozoologia di una produzione artistica di eta ellenistica". *Studi e fonti per la Storia della Regione Prenestina* 16, 1-92.

Sassu, R. 2013. *Templi senza altare*, thesauroi, oikoi. *Un'indagine sugli aspetti economici del santuario Greco*. PhD Diss. Roma.

Scholfield, A.F. (with an English translation of), 1958. Aelian, *Characteristics of Animals*. Cambridge.

Scullard, H.H. 1974. *The elephant in the Greek and Roman World*. Ithaca NY.

Semonin, P. 2000. *American Monster. How the Nation's First Prehistoric Creature Became a Symbol of National Identity*. New York.

Solounias, N. 2024. Putting Samotherium in its Place. *The Morphology of Giraffids and the Geology of Samos*. Cambridge.

Solounias, N. and Mayor, A. 2004. "Ancient references to the fossils from the land of Pythagoras". *Earth Sciences History* 23(4), 283-296.

Solounias, N. and Ring, U. 2007. "Ancient history of the Samos fossils and the record of earthquakes". *Journal of the Virtual Explorer* 27 (3), 1-16.

Tiberini, E.S. 1990. *La vita nelle mani. Arte e società in Haida Gwaii*. Roma.

Topsell, E. 1607. *The historie of foure footed beasts*. London.

Versnel, H.S. 1994. *Inconsistencies in Greek and Roman Religion*, Volume 2. *Transition and Reversal in Myth and Ritual*. Leiden.

Vitaliano, D. 1968. "Geomythology: The Impact of Geologic Events on History and Legend with Special Reference to Atlantis". *Journal of the Folklore Institute* 5 (1), 5-30.

Vitaliano, D. 1973. *Legends of the Earth. Their Geological Origins*. Bloomington.

Figures

Figure 1

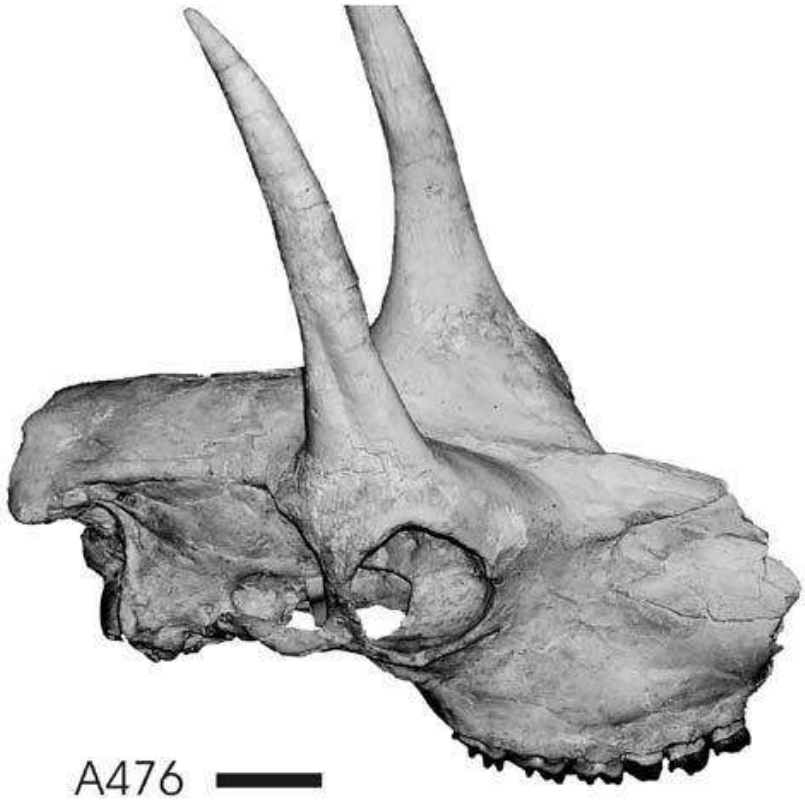

Figure 2

Figure 3

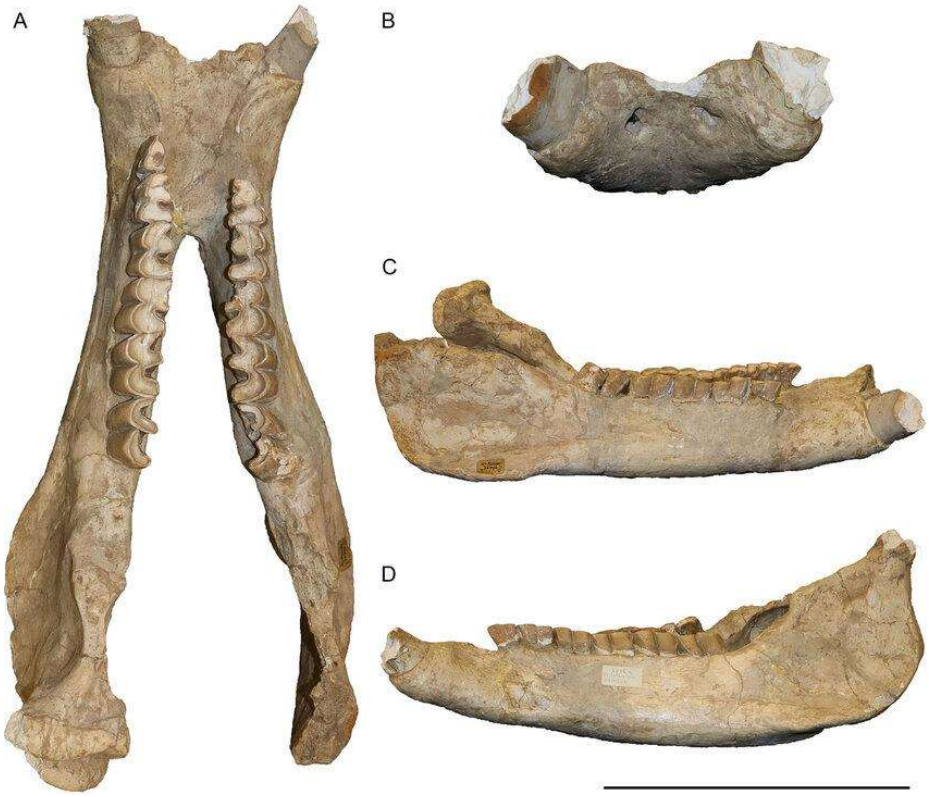

Figure 4

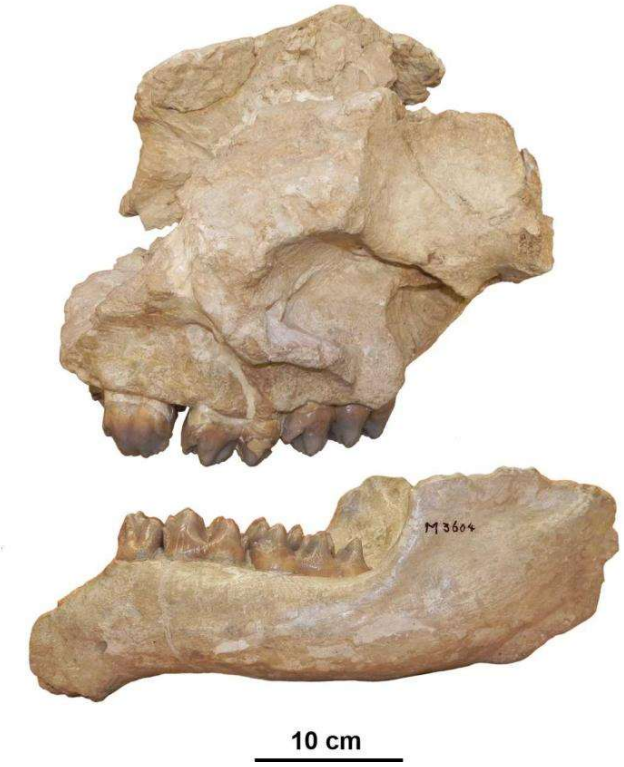

Figure 5

Figure 6

Figure 7

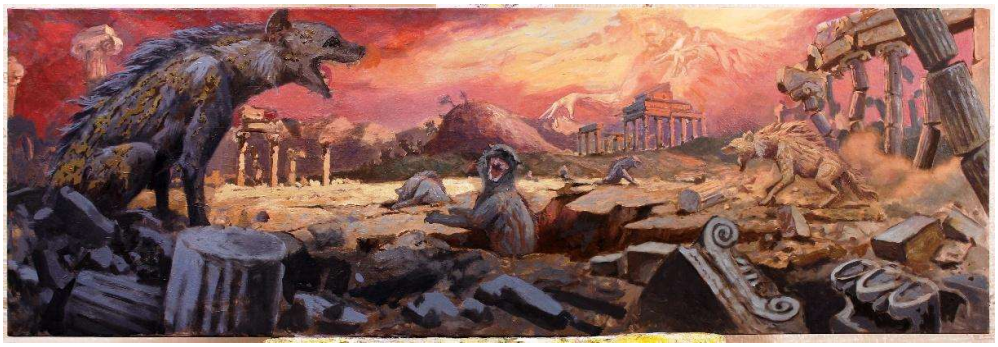

Figure 8

Figure 9

Figure 10

Figure 11

Descriptions

Fig. 1 - Bone bed from Gansu (Central China) at the Hezheng Museum (courtesy and copyright Nikos Solounias, from Solounias 2024)

Fig. 2 - Skull of *Palaeotragus rouenii f*rom Samos, dorso-lateral view (courtesy and copyright Dimitris S. Kostopoulos, from Kostopoulos, 2009)

Fig. 3 - Skull of *Chilotherium schlosseri* from Samos in left lateral (A) and right lateral view (B) (courtesy and copyright Panagiotis Kampouridis, from Kampouridis *et al.* 2023)

Fig. 4 - Mandible of *Chilotherium schlosseri* from Samos in dorsal (A), anterior (B), right lateral (C), and left lateral view (D) (courtesy and copyright Panagiotis Kampouridis, from Kampouridis *et al.* 2023)

Fig. 5 - Partial cranium and associated mandible of *Deinotherium proavum* from Samos (courtesy of and copyright George E. Konidaris, from Konidaris and Koufos, 2019)

Fig. 6 - Partial cranium and associated mandible of *Choerolophodon pentelici* from Samos (courtesy of and copyright George E. Konidaris, from Konidaris and Koufos, 2019)

Fig. 7 - A speculative reconstruction of the Neades in the elephantine hypothesis (artistic reconstruction by Emiliano Troco, oil on canvas 40x50)

Fig. 8 - A speculative reconstruction of the Neades as gigantic beastes similar to striped hyenas (artistic reconstruction by Emiliano Troco, oil on canvas 120x40)

Fig. 9 - Detail: Neades and ruins of the Heraion Fig. 10 - Detail: Pluto - the god of the interior of the earth - and the Neades

Fig. 11 – Front Cover: A speculative reconstruction of the Neades in the elephantine hypothesis (artistic reconstruction by Emiliano Troco, oil on canvas 50x80)