Monk Seals in Antiquity

The Mediterranean Monk Seal (*Monachus monachus*)
in Ancient History and Literature

William M. Johnson & David M. Lavigne

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by

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Abstract

The role of the Mediterranean monk seal (*Monachus monachus*) in the history and culture of ancient Greece and Rome is poorly documented in contemporary literature and generally misunderstood by many modern scholars. A comprehensive search was initiated therefore to locate all surviving references to the species in the classical literature of the Mediterranean region. The search yielded over 200 references authored by some 60 writers from the Greek, Roman and Byzantine periods. Examination of these texts, together with information derived from numerous secondary sources, provides new insights into the monk seal's distribution and abundance in antiquity. It also reveals ancient human attitudes toward the monk seal that resulted in its exploitation for fur, oil and meat, its use in medicines and entertainment, and its role in mythology and superstition. The accumulated evidence now suggests that many of the large monk seal herds that existed in early antiquity were either dramatically reduced or extirpated by intensive exploitation during the Roman era. Throughout much of its historical range, human persecution and progressive habitat deterioration also appear largely responsible for changing a naturally gregarious beach dweller into a less social and reclusive inhabitant of caves.

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The Mediterranean Monk Seal (*Monachus monachus*)
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INTRODUCTION

In the summer of 1997, two thirds of the largest surviving population of Mediterranean monk seals (*Monachus monachus*, Hermann, 1779) were wiped out within the space of two months on the Côte des Phoques in the Western Sahara (Harwood et al., 1998). While opinions on the precise causes of this disease epidemic remain sharply divided, the mass die-off emphasised the precarious status of a species already regarded as critically endangered throughout its range (Israëls, 1992; IUCN, 1996; Brasseur et al., 1997).

The Mediterranean monk seal was officially classified as 'endangered' in 1966, when the species was included in the first Red Data Book produced by IUCN, the International Union for Conservation of Nature and Natural Resources (Simon, 1966). At that time, the number of surviving animals was thought not to exceed 500 individuals. A more recent estimate also suggested that some 500-600 animals remained, prior to the 1997 die-off in the Western Sahara (Brasseur et al., 1997). However, because of the monk seal's retiring nature and secretive habits and variations in survey techniques, reliable abundance estimates remain elusive (Brasseur et al., 1997). In most cases, the published numbers must be regarded as little more than educated guesses (Israëls, 1992).

In spite of such numeric uncertainty, there can be little doubt that the species has declined in recent decades. Direct killing by fishers, incidental entrapment in fishing gear, and loss of habitat to urban development and mass tourism are the main factors implicated in its decline (Johnson & Lavigne, 1998).

Formerly the species occupied a wide geographical range (Figs. 1 & 2). Colonies were found throughout the Mediterranean, the Marmara and Black seas. The species also frequented the Atlantic coast of Africa as far south as Mauritania, Senegal (King, 1956) and the Gambia (Israëls, 1992), as well as the Atlantic islands of Cape Verde (Ronald & Healey, 1976), Madeira, the Canary Islands and the Azores (Brasseur et al., 1997).

More recently, however, the species has disappeared from most of its former range, with the most severe contraction and fragmentation occurring during the last 50 years (Brasseur et al., 1997). Nations and island groups where the monk seal has been extirpated during the 20th century include mainland France and Corsica, Spain and the Balearic Islands, Italy, Sicily and the Tuscan archipelago, and Egypt, Israel, Lebanon and Tunisia (Anon., 1994; Brasseur et al., 1997). The species is also thought to be on the brink of extinction in the Marmara and Black Seas (Kıraç & Savaş, 1996; Stefan Avramov *pers. comm*., 1996; Cem Kıraç & Harun Güçlüsoy *pers. comm.,* 1997) and the Adriatic coasts and islands of Croatia (Draganović, 1991 & 1994; Đjuro Huber *pers. comm.,* 1997). Despite

sporadic sightings, the species also appears effectively to be extinct in Sardinia (Johnson, 1998). As a result of this range contraction, the monk seal has been virtually reduced to two populations, one occupying the eastern Mediterranean and the other the northeastern Atlantic, off the coast of northwest Africa (Brasseur et al., 1997).

Today, the Mediterranean monk seal has the dubious distinction of being Europe's most endangered marine mammal (Johnson & Lavigne, 1998). Despite its growing rarity, little is known about the species' basic biology and behaviour, and, in certain respects, it may even be said that such knowledge has not advanced substantially since Aristotle

Fig. 1. Historical range of *Monachus monachus* within the Mediterranean, Marmara, and Black Seas.

Fig. 2. Historical range of *Monachus monachus* in the northeastern Atlantic.

conducted his seal observations on the island of Lesbos more than 2000 years ago (King, 1956; Sergeant et al., 1979; Harwood, 1987). Paradoxically, the same also holds true for contemporary understanding of the seal's role in ancient history and literature, much of which remains buried in obscurity. Existing historical profiles are generally limited to cursory accounts relying on a mere fraction of the surviving evidence (*e.g.* King, 1956; Toynbee, 1973; Sergeant et al., 1979; Ronald & Duguy, 1979 & 1984). Furthermore, few attempts have ever been made to draw any firm conclusions regarding the abundance, habitat, and behaviour of the species, and its exploitation in antiquity. The accounts that do exist are also notable for the contradictions, inconsistencies and errors they contain, further complicating the task of reconstructing an accurate historical portrait of the species.

While some authors have claimed that numerous seals populated the Mediterranean in ancient times (*e.g.* Keller, 1887; Ronald & Healey, 1976; King, 1983), others have concluded or implied that the species was never particularly abundant (*e.g.* Maxwell, 1967; Marchessaux & Duguy, 1977; Harwood et al., 1984). Similarly, depending on the individual author, monk seals either suffered their greatest decline during Greek antiquity (Keller, 1887), during the late 19th century (Marchessaux & Duguy, 1977) or under the relentless development pressures of the 20th century (Ronald & Duguy, 1979).[1]

Similar contradictions surround the origins of the monk seal's name. Some authors have asserted that the species was christened *monachus* either because of the colour of its fur (*e.g.* Cotte, 1944), or because of its reclusive lifestyle (*e.g.* Attenborough, 1987).[2] Others have implied that the name owed its origins to ancient times, when the Roman naturalist Pliny the Elder noted a striking resemblance between rows of seals, stretched out on the sands, and a procession of hooded humans (Ronald & Duguy, 1984). While these accounts are certainly intriguing, we could find no evidence to support them.[3] A clear indication that they are, in fact, erroneous is contained in the 1779 publication of Johann Hermann, the German naturalist who is credited with being the first to describe the species scientifically. Although certain coastal communities appear to have employed variations of the word 'monk' to describe the seal prior to Hermann's description, there is no evidence to suggest that such terms were ever used in antiquity (Hermann, 1779; Johnson & Lavigne, *in prep.*). Indeed, in ancient Greece, the seal was known simply as *phoca*. Keller (1887) suggests that this word may have been derived from Sanskrit (*sphâ* – 'to swell up'), thus meaning plump or swollen animal.[4] In contrast, the Romans, according to Pliny the Elder, knew the animals as 'sea-calves' (*vituli marini*) because "they make a noise like lowing" (*Natural History*, IX.41).

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[1] The Preface to Ronald & Duguy (1979) suggests that the monk seal was a common inhabitant of the Mediterranean during antiquity, but that modern human pressures (*e.g.* new fisheries technologies and mass tourism) were responsible for an estimated 90% decline in the population of the species during the preceding 50 years.

[2] "Their name 'monk' comes from a Greek word meaning 'solitary', for they are usually seen in ones or twos unlike other seals that congregate in herds" (Attenborough, 1987).

[3] Pliny the Elder (A.D. 23-79) lived several centuries earlier than the emergence of Christian monasticism. The comparison of beach-loafing seals to a 'procession of hooded humans' is untenable since there were no pagan monks, and monastic communities did not appear before the 3rd century A.D. (J. Donald Hughes *pers. comm.,* 1998).

[4] Other authors (*e.g.* Cotte, 1944) suggest that *phoca* may have Hebraic origins, its Greek meaning defined as "one who walks with difficulty".

Similarly, while Aristotle, the 'Father of Zoology', is often credited with being the first to describe the seal as a 'fin-foot' – or *pinniped* in modern (Latin) taxonomy – (*e.g.* Aristotle, *On the Parts of Animals*, 697b, 1-8; Darling, 1950; Ackerman, 1992; French, 1994), there is also evidence to suggest that Homer employed the term 'swim-foot' many centuries earlier (*e.g.* Eustathius, *Commentarii ad Homeri Odysseam*, Vol. 1, page 173, line 14; Keller, 1887; Cotte, 1944).

The mordant observation of British author Philip Guedalla, that "History repeats itself; historians repeat each other," is also strikingly appropriate to contemporary knowledge of monk seal history, particularly where errors, through constant repetition, attain the status of unassailable truths.

Several authors, for example, record the existence of a Roman-era mosaic, known as *The Judgement of Paris*, on the eastern Aegean island of Kos, depicting various animals facing gladiators in the circus or amphitheatre. Among them is purported to be a seal (Toynbee, 1948 & 1973; Robert, 1971; Ronald, 1977; Sergeant et al., 1979). However, a 1997 visit to the island and an examination of the mosaic in the company of the director of the Kos Archaeological Museum, Dimitrios Bosnakis, strongly suggests that the animal in question is, in fact, a bear (Figs. 3 & 4). This conclusion appears to be borne out by the stylistic similarities of animal images identified as bears on the same mosaic (Toynbee, 1948; Dimitrios Bosnakis *pers. comm*., 1997). Possibly, archaeologists assumed that the animal was a seal because of the name it was given – ΕΥΠΛΟΙΑ or 'Fair-Sailing'. This word was regarded as an omen or blessing of good fortune for seafarers, usually associated with the goddess Aphrodite (Dimitrios Bosnakis *pers. comm*., 1997).

Similarly, several other modern references to the monk seal in antiquity did not withstand scrutiny. For example, we found no evidence for the assertion that Strabo "described the species congregating torpidly on the beaches" (Ronald & Duguy, 1984),

Fig. 3. ΕΥΠΛΟΙΑ or 'Fair-Sailing', an animal depicted on the 'Judgement of Paris' mosaic on Kos, and identified as a seal by several scholars. Photo: Matthias Schnellmann.

Fig. 4. Despite striking stylistic similarities, an animal facing attack in the Roman circus depicted on the same mosaic has been identified as a bear. Photo: Matthias Schnellmann.

or that Hippocrates "was able to see from his home their dark bodies languishing on the hot sandy beach a thousand metres below him" (Ronald & Duguy, 1979).

Occasionally, even the humble typographical error may lead readers astray. According to one author (King, 1956), for example, seal skins were used in ancient times in the making of "boots"; yet in a later paper, quoting the same source, this has been transformed into "boats" (Ronald, 1973).

Ancient writers, too, could sometimes stumble carelessly into error and misinterpretation. Plutarch, for example, tells us that "the Black Sea is most favoured for spawning by very many fish. It breeds no large sea beasts at all except an infrequent seal and a small dolphin..." (*The Cleverness of Animals*, 981 C). But emphasising just how tenuous and fragile our reliance can be on the subjectivity inherent in history, Plutarch's contemporary, Pliny the Elder, declares: "No creature harmful to fish enters the Black Sea besides seals and small dolphins" (*Natural History*, IX.50). While the discrepancy may seem minor, it could well represent the difference between several seals and thousands.

On a more fundamental level, puzzling discrepancies also surround the innate character of the species, and its habitat. In many early accounts, monk seals were noted for their gregarious and frolicsome nature, and even their tameness and friendly impudence towards humans (*e.g.* Brusina, 1889). They congregated on open sandy beaches and shoreline rocks, loafing about in the sun, and were even said to adapt well to captivity, their striking intelligence making them easy to train (*e.g.* Keller, 1887). Later records, however, all speak of the seals as solitary and reclusive, shying away from human contact, and seeking refuge in caves, often along remote, cliff-bound coasts. If such conflicting reports were both true of their time, what might have provoked this drastic change in temperament and behaviour?

In order to sort out the contradictions, inconsistencies, and errors that exist in available modern accounts, we undertook a comprehensive review of the ancient literature from Greek, Roman, and Byzantine times. Our objective was to reconstruct, as accurately as possible, the history of the Mediterranean monk seal, and in particular, its interactions with humans, from the beginning of recorded history to the end of the Roman period.

Our research suggests that the species actually played an important role in the civilisations that once flourished along the shores of the Mediterranean, occupying its own special place in their culture, myths and folklore, in economy, medicine and science. The accumulated evidence also suggests that, as a result of exploitation, much of which was for commercial purposes, the monk seal suffered its greatest decline during the Roman era, a period already noted for its devastating impact upon many wild species that populated the Mediterranean basin (Hughes, 1988). Indeed, many of the large monk seal herds that existed in early antiquity appear to have been either dramatically reduced or extirpated during the Roman era. At the same time, human persecution and progressive habitat deterioration appear to have resulted in a reduction in gregarious behaviour, culminating in the often solitary and reclusive cave dweller found today throughout much of the species' shrinking range.

METHODS

A literature search was conducted using several morphological variants for the keyword 'seal' in ancient Greek and Latin. Three standard computerised databases of classical literature were used: *Pandora*, the *Thesaurus Linguae Graecae* and the 'Latin Texts' CD-ROM of the Packard Institute for the Humanities. Search terms in ancient Greek, forms of the word 'phoca', included – but were not limited to – φωκαι, φώκαις, φώκε, φώκη, φώκην and φώκης. Search terms in Latin included forms of the term 'sea-calf', including *vitulo marino*, *vituli marini, vitulis marinis*, *mari vituli*, and also Latinised forms of 'phoca', including *phocas*, *phocis*, *phocae*, *phocarum*. Those texts identified in the search as bearing relevant keywords were then obtained in English, French or German translation, where available. The services of specialists were contracted to translate, into English, those texts that only existed in original Greek or Latin. These specialists also provided further assistance in terms of background knowledge and textual interpretation.

In addition to the database searches, library research yielded many additional secondary sources of information. A systematic effort was also made to trace all ancient references to the monk seal, contained in various books, reports and specialised encyclopaedias, to their original sources.

To provide additional context, we also compiled biographical profiles of the various authors encountered in the ancient literature. Major sources of bibliographic information included: *Paulys Real-Encyclopädie der classischen Altertumswissenschaft*, the Encyclopaedia Britannica, The Oxford Companion to Classical Literature (Howatson, 1995), and the Dictionary of Ancient History (Speake, 1995). Where other sources have been consulted, the relevant references are given in the text.

RESULTS AND DISCUSSION

Our literature search yielded over 200 references authored by some 60 writers from the Greek, Roman, and Byzantine periods (see Bibliography). The relevant texts are presented in the Appendix, in alphabetical order by author. To facilitate further study and analysis, we have quoted the relevant extracts at length. For the most part, these texts are self-explanatory, but where considered necessary, additional lines of clarification are provided.

An analysis of the ancient texts (Appendix), supplemented with information obtained from numerous secondary sources, provides considerable insights into the current plight of the Mediterranean monk seal, including changes in the species' abundance and distribution over time. Additional insights emerge from a consideration of human attitudes towards the animals in antiquity, which led, among other things, to their commercial exploitation and to the degradation of their marine and terrestrial habitats. Such insights are discussed in detail below.

Monk seals in myth and legend

While it may be regarded as a relatively obscure species today, the Mediterranean monk seal played an important role in many ancient myths and legends, indicating that it was once well-known to inhabitants of the Mediterranean basin. Such folklore not only sheds light on human attitudes towards the species in antiquity, but also provides additional clues regarding its former habitat, abundance, and distribution.

Aside from Biblical references, which we shall turn to in due course, the earliest known record of monk seals in ancient literature appears in the *Odyssey*, generally believed to have been composed by the Greek epic poet Homer in the 8th century B.C. (Howatson, 1995; Speake, 1995). Book IV of the poem sees King Menelaus of Sparta recounting his arduous voyage home from the Trojan War. Afflicted by the same Olympian curse that was keeping Odysseus from his island kingdom in Ithaca, Menelaus had endured eight years of exile in the southern waters of Phoenicia, Ethiopia, and Egypt (Graves, 1955). For twenty days, the gods had becalmed his ships on the Egyptian island of Pharos, bringing him and his men to the brink of starvation. It is at this point in the narrative that the sea nymph Eidothea, "daughter of mighty Proteus, the ancient sea-god," comes to their rescue (*Odyssey*, IV.368).[5]

In ancient Greek mythology, Proteus was the wise "old man of the sea" (Guirand, 1959) and "the shepherd of the seals" (Nonnus, *Dionysiaca*, XLIII. 229-230).[6] Though a vassal or servant of Poseidon,[7] Proteus could boast a distinguished lineage. His father was Oceanus, the River-Ocean god who gave birth to all rivers and seas. His mother was Tethys, the daughter of Gaia and Uranus, or Earth and Heaven (Graves, 1955; Guirand, 1959). The seals themselves were "the brood of the lovely child of Ocean" (*Odyssey*, IV.398 *et seq*.), a reference either to the Nereid Halosydne (Guirand, 1959) or simply an adjectival reference to the sea (Eustathius, *Commentarii ad Homeri Illiadem* [lib. A-P], Vol.4, page 153, line 17).[8] Others have interpreted Homer's allusion to seals being the children of water ('Ocean' in some translations) as an epithet of Amphitrite, a sea goddess who was the wife of Poseidon and the mother of Triton (Eustathius, *Commentarii ad Homeri Odysseam*, Vol. 1, page 173, line 14-20).[9]

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[5] The localisation of Proteus' dwelling place to the island of Pharos, near the mouth of the River Nile, was probably due to confusion with the fabled King of Egypt, who was also named Proteus (Guirand, 1959). Other records also speak of the sea god inhabiting the Aegean island of Karpathos, between Crete and Rhodes (Encyclopaedia Britannica, 1997).

[6] *Cf.* Callimachus, *Fragmenta et titulus*, frag. 254,6; Eustathius, *Commentarii ad Homeri Odysseam*, Vol. 1, page 172, line 35; ibid., page 173, line 33.

[7] *Cf.* Homer, the *Odyssey* IV.386; Virgil, *Georgics*, IV. 394-5.

[8] *Cf.* Eustathius, *Commentarii ad Homeri Odysseam*, Vol. 1, page 173, line 14-20.

[9] No extensive mythology surrounds Halosydne. According to *Pauly's Real-Encyclopädie der classischen Altertumswissenschaft* (VII.2) the name might be interpreted as 'daughter of the sea'. This is the meaning conveyed when used as an epithet of Thetis (Homer, the *Iliad* 20.207), and of the Nereids (Apollonius, *Argonautica* 4.1599). Elsewhere, Halosydne is simply regarded as an epithet of the sea. Thus, in some translations of *Odyssey* 4.404, Homer's reference to "the seals, brood of beautiful Halosydne" has been altered to read "the seals, the brood of the fair daughter of the sea". Similarly, Preller-Robert (Griechische Mythologie 1,554) argues that Halosydne is a personification of the sea, as well as an epithet of Amphitrite, a sea goddess. Graves (The Greek Myths, 1.16.1) notes that Amphitrite's appearance in the Homeric poems must also be regarded as an epithet of the sea, rather

Homer's characterisation of Proteus bears a striking resemblance to the seals he shepherds for Poseidon. He inhabits arching caves and, shepherding his flock, emerges from the sea at noon – the very time that seals might be expected to seek shelter from the summer's fierce Mediterranean sun. Although it may only be coincidental, Proteus is also portrayed as being likely to flee at the first inkling of human presence. As Menelaus tells the sea nymph Eidothea: "You yourself must contrive some way to entrap this ancient god; if not, he may see me or sense me all too soon, and then he will elude me" (*Odyssey*, IV.393).

Proteus was also endowed with potent oracular powers, and this particular myth may have given rise to folklore that portrayed the seals themselves as prophetic creatures.

The scholiasts to Homer, for example, noted that "seals are useful for magical witchcraft" (Eustathius, *Commentarii ad Homeri Odysseam*, Vol. 1, page 173, line 9). From scholiast E we learn that "Proteus lives together with the seals because they are the most useful of all the sea creatures for prophecy"; from scholiast V that Proteus lives with them "because they are the most useful of all the sea creatures for magic"; from P and Q that "The seal is useful for magic" (Dindorf, 1962; Tina Marshall *pers. comm.,* 1996).[10]

In later folklore, a weeping seal was said to portend future tragedy and to symbolise the animal's lament for human misfortune (Polites, 1904). Although the roots of such cultural beliefs remain obscure, it is possible that they reflect the deeper, moral implications that coastal communities faced in hunting and killing seals. These folk tales may thus have served to absolve hunters from the guilt of killing a creature that was not simply seen as an animal, but as a 'man of the sea' (*e.g.* Gesner, 1563; Brusina, 1889) or a being that possessed certain supernatural powers. It is equally possible that the legends surrounding the weeping of seals reflected the morally unsettling sight of seeing the animals shedding tears after capture. The 18th century German naturalist, Johann Schreber, for example, noted that "when they are caught, they shed many tears" (Schreber, 1778).[11] Conceivably, the same explanation may apply to folk tales that portray a seal 'melting the heart' of a man with her tears, suggesting sympathetic human grief for a suffering animal (Polites, 1904).

A passing reference to Poseidon's ultimate command over the seals is contained in the legend of Hippolytus, the bastard son of Theseus, King of Athens. Punishing Hippolytus for his affection for a rival goddess, Aphrodite cast a spell over his mother, Phaedra, causing her to fall passionately in love with him. Horrified by her written confession, Hippolytus rushed to her chambers to berate her, but in the midst of his loud reproaches she tore her clothes and cried out accusations of rape. After Hippolytus fled, she hanged herself, leaving a note accusing him of seduction. Theseus, upon hearing the news, cursed Hippolytus and swore revenge. Remembering the three wishes granted him by his father,

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than as a personification of Poseidon's wife. Bell (Dictionary of Classical Mythology) suggests that, in *Odyssey* 4.404, 'Amphitrite Halosydne' means the 'sea-fed' or 'sea-born' goddess. The obscurity of Halosydne inspired lengthy discussion by Eustathius. Hindered by the rarity of the word, which appears only in a handful of passages, modern scholarship has added little to Eustathius' original comments (Pauly-Wissowa, 1894; Graves, 1955; Bell, 1982; Tina Marshall *pers. comm.,*1998).

[10] The scholiasts are identified only by letters. Their comments (Dindorf, 1962) refer to *Odyssey* Book 4, lines 403-4 (Tina Marshall *pers. comm.,* 1996).

[11] Lavigne and Kovacs (1988) write: "Unlike those of terrestrial mammals, the seals' eyes lack ducts to drain away the tears. For this reason, seals on land or ice frequently appear to be 'crying'."

Fig. 5. A monk seal – a species that may once have inspired countless myths and legends involving mermaids and sirens – swimming off the aptly-named 'Siren Rocks' in the Foça Specially Protected Area, Turkey. Photo: Matthias Schnellmann.

Poseidon, he entreated the god to send a sea beast to kill Hippolytus. As Hippolytus raced his chariot along the seashore, a huge cresting wave thundered towards him, from which appeared a great dog-seal.[12] Unable to control his terrified horses, Hippolytus was thrown from his chariot, and was dragged to his death (Graves, 1955; Howatson, 1995).[13]

Folklore dating back both to the Middle Ages and antiquity suggests that the Mediterranean seal may also have inspired countless myths and legends involving sirens, nymphs, and mermaids (*e.g.* Gesner, 1563; Brusina, 1889; Graves, 1955; Macdonald, 1984; Johnson & Lavigne, *in prep.*).

On his meandering and adventurous voyage homeward from the Trojan War, Homer's indomitable hero, Odysseus, was compelled to sail his ship past the treacherous island of the Sirens. On promontories of rock, these sea nymphs lay in wait for unsuspecting seafarers, singing a song so mesmerising it lured passing ships to their doom. One of the earliest surviving references to the siren-seals is found in the writings of the Roman sophist Aelian (A.D. 170-235), who warned his readers that "Sea-calves lying on headlands and projecting rocks utter a kind of ominous cry… and whoever hears this sound, for him there is no escape, but he dies soon after..." (*On the Characteristics of Animals*, IX. 50). In more recent times, researchers have noted the high-pitched, siren-like sound that mother seals make in warning their pups of danger (Mursaloğlu, 1964; Harun Güçlüsoy *pers. comm.*, 1997).

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[12]According to some variations to the myth, Hippolytus was pursued by a white bull.

[13]See also *Fragments of Unknown Origin*, 'A.6.445.5'.

A more recent (Neo-Hellenic) legend, its roots entwined in ancient myth, portrays Alexander the Great's mother as seal, and his sister, Gorgo, as a mermaid. Following Alexander's death, Gorgo was said to approach sailors and ask them if her brother still lived. A reply of 'no' would so upset the mermaid that she would stir up the sea into a storm. Thus, the wisest seafarers would always answer "He lives and reigns!" (Polites, 1904).

In addition to his prophetic powers, Proteus was also renowned for his ability to metamorphose at will in order to elude those intent upon capturing him. Though almost exclusively involving human-seal transfigurations, metamorphosis was to become a common characteristic of many later myths involving not only *M. monachus*, but other pinnipeds as well (*e.g.* the selkies of Celtic mythology; see Fry, 1995; Lavigne et al., 1999).

In the *Odyssey*, Menelaus and his men successfully trap Proteus, and after enduring his terrifying shape-shifting, they are at last rewarded with the prophecies that will help them escape Pharos and the southern seas. According to Homeric tradition, Menelaus and Helen resumed their reign of Sparta, and lived out the rest of their days in royal splendour (Graves, 1955). Photius, however, offers an intriguing variation to the myth, observing that Helen, the "Aegyan bitch" (Lycophron, *Alexandra*, 847-850) whose fatal beauty and affair with Paris sparked the Trojan war, may have suffered an entirely different fate on the homeward voyage. As Patriarch of Byzantium, Photius diligently catalogued, quoted and commented upon all the books he read and studied, a good number of which were later fated to be lost or destroyed (Howatson, 1995). In a passing reference to an apocryphal variation to the Homeric legend, Photius records that the sea nymph Thetis plotted divine vengeance against Helen as the ship sailed back to Sparta. Presumably angered by the death of her son, Achilles, at the hands of Paris during the siege of Troy, she transformed herself into a seal and then drowned the unsuspecting Helen (Grimal, 1990; Photius, *Bibliotheke*, 149b).

Jacob (1979) cites a metamorphosis myth of a rather different kind in certain (more recent) folkloric interpretations of Exodus in the Old Testament. Having successfully parted the Red Sea to allow the Hebrews to escape the pursuing armies of the Pharaoh, Moses raised his staff to command the waters to return. As the Pharaoh and his men were swallowed by the resulting flood, they were turned into seals, the size of each animal commensurate with their former status in the Royal hierarchy (*Exodus*, 2.14-15).

Seal metamorphosis also plays a role in legends describing the founding of two powerful city states that took the animal as their name and emblem, Phocis and Phocaea. In Greek mythology, Phokos (a name derived from the word for 'seal' in ancient Greek) was the offspring of the sea-nymph Psamathe, and Aeacus, a love child sired by Zeus. Apollodorus, an Athenian writer living in the second century B.C., tells us that Psamathe "turned herself into a seal" while unsuccessfully struggling to fend off Aeacus' embraces (*The Library*, III. xii. 6). Recounting the myth, the Greek lyric poet Pindar (538–418 B.C.) wrote that Psamathe eventually gave birth to Phokos "by the break of the wave" (*Nemean,* V.10).

Graves (1955) notes that the seal metamorphosis reflected in this legend is actually far from unique. "The myth of Aeacus, Psamathe ('sandy shore'), and Phocus ('seal') occurs in the folklore of almost every European country," he observes. "Usually the hero sees a

flock of seals swimming towards a deserted shore under a full moon, and then stepping out of their skins to reveal themselves as young women. He hides behind a rock, while they dance naked on the sand, then seizes one of the seal skins, thus winning power over its owner, whom he gets with child. Eventually they quarrel; she regains her skin and swims away" (Graves, *The Greek Myths*, 81.1).

Another seal transformation takes place in the mythological epic *Metamorphoses* in which the Latin poet Ovid tells us of Cephisus, a river-god in Phocis who is "bewailing the fate of his grandson changed by Apollo into a plump sea-calf..." (*Metamorphoses*, VII, 386-390).

Phocis became a powerful state in ancient Greece, stretching from Mount Parnassus to the Gulf of Corinth, and in mythology its founding can be traced back to Phocus, the doomed love child of Psamathe and Aeacus. Consumed with jealousy of their half-brother's athletic prowess and their father's doting love for the boy, Aeacus' two other sons, Telamon and Peleus, brooded and plotted revenge. Suspecting that their father might bequeath his island kingdom of Aegina to Phocus, the brothers conspired murder, dispatching him with a stone discus and an axe, and concealing his body in the woods (Graves, 1955).

Writing in 1887, Otto Keller offers an intriguing – and perhaps far-fetched – interpretation of the murder. Recognising that the convoluted strands of myth are often intertwined with events rooted in history, he contends that the rugged coasts of Greece were once inhabited by numerous seal herds, and that the murder of Phokos symbolised the extermination of the animals by hunters on Aegina (Keller, 1887).

Despite his cruel fate, Phocus' fame was destined to outlive him, with two fledgling states being established honouring his name. In his notes to the translation of *The Library* by Apollodorus, Sir James Frazer observes that "The children of Phocus settled in Phocis and gave their name to the country... Thus we have an instance of a Greek people, the Phocians, who traced their name and their lineage to an animal ancestress" (Frazer, 1921).

Phocaea, the ancient city buried under the present-day town of Foça on Turkey's Aegean coast, can also be traced back to Phocus and his 'seal mother'. The founding lineage of Phocaea is recorded by Pausanias, a Greek travel writer of the second century A.D. In his *Guide to Greece*, he reports that "The Phocaeans are by birth from the land under Parnassus still called Phocis, who crossed to Asia..." (*Guide to Greece*, III.10).

According to Heraclides Lembus, a statesman and scholar of the 2nd century B.C., there were two schools of thought regarding the naming of Phocaea. Some believed that the founders had named the settlement in memory of their ancestral leader, Phokos. Others, however, contended that the name had been inspired when the settlers "saw a seal coming to dry land" at the chosen site for their new city (Heraclides Lembus, *Excerpta politiarum*;[14] Marangou et al., 1995; Tina Marshall *pers. comm*., 1996). Similarly, Aelius Herodianus speculated that the city had been named Phocaea "on account of the fact that many seals followed after the founders" (*De prosodia catholica*, 3,1,273,1).

Although the monk seal was both honoured and vilified by some of the most prominent writers in antiquity, there is but one known surviving example of the species appearing in ancient Greek art (Bloesch, 1982). The unfaded image of a Mediterranean monk seal

[14]This reference was previously attributed to Heraclides Ponticus, a Greek philosopher and astronomer of the 4th century B.C. (Tina Marshall *pers. comm*., 1996).

appears on a three-handled water vessel, believed to be almost 2,500 years old, and to be of Phocaean descent (Marangou et al., 1995). Classified by archaeologists as a *Caeretan hydria* because of the characteristics of its design, the artefact was exhumed from a grave in Italy, together with two other vases originating from the same anonymous workshop.

The hydria depicts a naked mythological hero valiantly doing battle with a sea monster, or *ketos*, a sickle-shaped weapon in one hand, and a stone in the other. A pair of dolphins, an octopus, and a solitary, anxious seal bear witness to the struggle (Fig. 6).

Interpretation of the scene has sparked much debate among archaeologists. Some conclude that the illustration reflects the myths of the monster-slayers Perseus or Herakles as they struggled to rescue the princesses Andromeda or Hesione from the love of the sea creatures that imprisoned them (*e.g.* Bloesch, 1982). Other archaeologists, however, have cast doubt on this hypothesis, arguing that the absence of these 'damsels-in-distress' on the hydria, and the missing seal in the legends, must point to a different explanation. Advancing an entirely different theory, some scholars believe that the illustration is intimately connected with the legends and recorded history surrounding the founding and fall of Phocaea, the ancient city that took the monk seal as its name and its emblem (Marangou et al., 1995).

Unique stylistic traits have led archaeologists to conclude that all 38 Caeretan hydriae known today were made in the same short-lived workshop by Ionian artists. From the brush-strokes and distinctive styles, archaeologists have been able to identify the hands of two individual vase-painters, one of whom would have created the image of the seal in around 520 B.C. They believe that the workshop produced hydriae for export to Etruria, the centre of the Etruscan civilisation in present-day Tuscany and Umbria, and the most lucrative market in the West during that period. Piecing together various other strands of evidence, they conclude that the hydriae were created by Ionians of the Dias-

Fig. 6. Caeretan hydria, circa 520 B.C. Photo: S. Hertig, Archäologisches Institut der Universität Zürich.

Fig. 7. Caeretan hydria (detail). Photo: S. Hertig, Archäologisches Institut der Universität Zürich.

pora, refugees from Phocaea who settled in the Etrurian city of Caerea following the fall of their city to the Persians in 545 B.C. (Marangou et al., 1995). The event was recorded by Herodotus, the 'Father of History', who tells us that the Phocaeans could not endure the prospect of slavery, and thus fled their native land in search of exile in the West (*The Histories*, I, 164-169).[15]

Considering the date in which it was painted, the seal image that adorns the hydria is remarkable for its accuracy, outshining even the drawings of naturalists in much later centuries. The animal's large head, plump features and white belly all attest to the skill of the artist, and his intimate knowledge of the species (Fig. 7).

Greek scholars observe that the "seal seems to leap up from the depths of the sea... Confident incisions on the neck and head give the seal a troubled expression, as if worried about the outcome of the man's struggle with the monster." In their view, the painting represents the faint echo of a lost legend, a popular oral myth recounting how the city nymph of Phocaea was nearly devoured by a monster, but transformed herself into a seal just as the great hero arrived to rescue her (Marangou et al., 1995).

Phocaean coins depicting a sea nymph with a seal swimming below her (Imhoof-Blumer, 1908), appear to lend additional credence to the theory of the hydria's myth-rooted design and Phocaean origin.

Phocaean coins were minted in silver and electrum, an amalgam of gold and silver. The earliest seal motifs have been dated to 625 B.C., and the series that followed spanned

[15]Herodotus writes: "...the Phocaeans at once launched their galleys, put aboard their children and women and moveable property, including the statues and other sacred objects from their temples – everything, in fact, except paintings, and images made of bronze or marble..."


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Fig. 8. Silver drachma coin of Phocaea, dated to the second half of the 6th century B.C.
Fig. 9. Electrum coin minted in Phocaea, c. 600 B.C.
Fig. 10. Three seals swimming within a circle of pearls. Phocaean coin dated to 521-478 B.C.

300 years, finally coming to an end in 326 B.C., long after the Persian invasion (Figs. 8, 9 & 10). Archaeologists have identified 120 'seal-coinage' issues during this period, most originating from Phocaea but others from its island ally, Lesbos. While most depict either the animal's head or entire body, an earlier issue of a more clumsy or primitive design also portrays seals in a group, with three larger and two smaller animals (Bodenstedt, 1981).

In its heyday, Phocaea was an important naval and trading power. By the 6th century B.C., it had become one of the largest cities in the world, its ancient fortress walls more than five kilometres long (Özyiğit, 1994). The Phocaeans, Herodotus tells us, were the first Hellenes to become accomplished seafarers, their 50-oared ships taking them beyond the Pillars of Hercules to the Atlantic shores of southern Spain (*The Histories*, I, 163). Around 600 B.C., the Phocaeans founded Massalia – the modern-day city of Marseilles – which also took the Mediterranean monk seal as its emblem (Jacob, 1979; Dimitropoulos, 1989).

Apart from a rich trove of Phocaean coins, found at various archaeological sites, excavations at Foça have so far failed to unearth any trace of the ancient city's seal insignia. The archaeologist leading research at Foça, however, has noted that it will take another century to complete excavations at the site. Artefacts that bear the seal's image may thus still await discovery (Ömer Özyiğit *pers. comm.,* 1995).

Human attitudes

Despite the poetic imagery often conveyed in myths and legends, the ancients generally held a cynical and hostile view of the monk seal, believing it to be deformed of body, rank in smell, and malignant in character.

It is reasonable to assume that such antipathy towards the species confronted the seal in its own habitat with open and deliberate hostility. Indeed, as a matter of historical conjecture, it might be said that such mystifyingly vehement prejudice both reflected and spurred-on the persecution of the species. Like many animals that are killed as pests, or hunted for their hide, tall tales and folklore maligning the species appear to have been common, each reinforcing that lethal prejudice. Even among those ancient texts that have managed to survive the passage of time, a good number testify to the seal's evilness of character, its sinister behaviour, and the damage it wreaked. Such descriptions undoubtedly speak more eloquently about human

attitudes and behaviour than those of the seal itself, yet they are compelling precisely for this reason. On a deeper level, the tendency towards negative stereotyping of the seal in classical literature and folklore may actually reflect a phenomenon of deeper significance, one that remains common to this very day: an effort to demonise a species, which in turn absolves the moral human animal from the taint of guilt in killing and persecuting it. Such attitudes may appear contradictory when compared to the seal's role in myth and its association with the gods. Yet rather than acting as a moral restraint, it is possible that the seal's perceived connection with the supernatural gradually served to bolster such negative attitudes by inspiring fear and distrust towards the species.

According to Keller (1887), monk seals in Greek mythology were placed under the protection of Poseidon and Apollo because they showed a great love for sea and sun. While the seals owed allegiance to the god of the sea through their shepherd, Proteus, several references,[16] albeit tenuous, also point to a connection with the sun-god, Apollo. In seeking to explain why a god so often associated with purity should have the despised and 'rank-smelling' seal as a tutelary animal, Keller suggests that Apollo was originally regarded only as the god of sun and heat, and not of purity.

To what extent such religious beliefs ever coloured human attitudes towards the species remains uncertain. Because Poseidon was the god of the sea, and protector of all that lived beneath the waves, certain priests and holy men shunned any exploitation of marine animals, including fish (Radcliffe, 1926; Plutarch, *Moralia, Table-Talk*, 730, D,E). Similarly, Plutarch writes that "Aphrodite, born of the sea, regards practically all sea creatures as sacred and related to herself and relishes the slaughter of none of them" (*The Cleverness of Animals*, 983, E,F).

There is little evidence to suggest, however, that the seal's connection with the gods Halosydne, Proteus, Poseidon and Apollo resulted in the species being held in any particular reverence.

While Proteus was described as the shepherd of the seals (Nonnus, *Dionysiaca*, XLIII. 229-230), and their guardian (Philostratus, *Imagines*, II. 17, 11.), and was regarded with respect and awe for his supernatural powers, this did not deter Menelaus and his warriors from wrapping themselves in the freshly-flayed skins of the animals in order to deceive the sea god (Homer, the *Odyssey*, IV.432 *et seq*.). Even more crucially, there is no hint in Homer's words of this act being tantamount to sacrilege, or of it even giving offence to the mighty, shape-shifting god.

Eustathius sheds additional light on this issue in his detailed commentaries and analysis of Homer's works and language. While the seals were portrayed either as a possession of Halosydne or as her children (*Commentarii ad Homeri Odysseam*, Vol. 1, page 173, line 20), Proteus was likened to a "herdsman among flocks of sheep," and was therefore responsible for the welfare of the seals under his care (ibid., Vol. 1, page 173, line 33). Sheep, however, are also human possessions (ibid., Vol. 1, page 173, line 20), and are utilised for human needs. Eustathius goes on to add that, while Eidothea carried the freshly-flayed seal skins to hide Menelaus and his companions in the cavern, Homer makes no specific mention of who may have been responsible for killing or skinning the animals (ibid., Vol. 1, page 175, line 35).

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[16]Keller cites Ovid, *Metamorphoses*, VII, 389 as a reference. See also, The Homeric Hymns, *Hymn to Apollo* 70-78.

No doubt there were regional variations in attitudes towards the seal, based on tradition and religious beliefs. To fishers in certain areas of Lebanon and Turkey, for example, the act of harming a monk seal was, until relatively recently, regarded as a grave sin. It was even said that anyone foolish or evil enough to kill one of the animals would himself suffer an agonising death within days (Ronald, 1973; Berkes, 1978; Şakir, 1991 & 1995). Yet even such unambiguous taboos did not prevent the monk seal from being wiped out in Lebanon and severely depleted in Turkey by the 1980s (Mursaloğlu, 1980; Marchessaux, 1989).

Similar injunctions may well have been seen in the ancient world, yet it is also true that taboos against the killing of certain animals were gradually swept aside as society became increasingly utilitarian and human populations increased. The dolphin, for example, was held in particular reverence by ancient writers and artists, yet this did not prevent the animal being killed as a pest and as a food source, and even mutilated in the interests of science. Pliny, for instance, tells us that "Dolphins... live as much as 30 years, as has been ascertained by amputating the tail of a specimen for an experiment" (*Natural History*, IX.22). Elsewhere, he notes that "dolphins are charmed even by music, and are caught while bewildered by sound" (ibid., XI.137).

Even where monk seals became the symbol of city states, there is no conclusive evidence to suggest that either laws or moral injunctions prevented the killing or exploitation of the animals. Frazer (1921) cautions that "it would be rash to infer that the seal was the totem of the Phocians. There is no evidence that they regarded the seal with any superstitious respect, though the people of Phocaea, in Asia Minor, who were Phocians by descent, put the figure of a seal on their earliest coins." However, the act of embossing the image of the seal upon the coins of the city might, in itself, be interpreted as a form of respect. J. Donald Hughes (*pers. comm.,* 1998) notes that the Athenians not only minted coins with owl images, but also protected the little owls *Athene noctua* (Scopoli, 1769) that nested on the Acropolis. Even so, history suggests that people can often be ambivalent towards their totems, as indicated in more recent times by the treatment of the kangaroo in Australia and the bald eagle in the United States.

Even discounting doubts over human attitudes towards the monk seal in Phocaea, surviving ancient texts mostly suggest that humans viewed the species with disdain and ridicule. Some degree of fear, however, is also evident, possibly because of the animal's perceived association with supernatural forces, an issue that we shall return to later. A certain element of fear may also have been inspired by the seal's association with the sea, which commanded both awe and superstitious respect. Several ancient writers, for example, categorised the seal among the many "fearful… sea monsters" (Gregorius Nyssenus, *De creatione hominis sermo primus*, 18a, 8)[17] that were thought to inhabit the Mediterranean,[18] a belief that was to endure well into the Middle Ages and Renaissance (Johnson & Lavigne, *in prep.*) The authoritative Liddell-Scott-Jones Greek Lexicon cites *Odyssey* 4.446 and 4.452 as examples of the word *ketos* (sea monster) being used to describe seals (Tina Marshall *pers. comm.,* 1996). Similarly, Oppian described the seal

[17]Despite Gregory of Nyssa's belief that such creatures had, through God's design, come "under the command of man", his reference to "those fearful names of sea monsters" appears to be a rhetorically indirect way of suggesting that both the names and forms of these animals inspire fear (Tina Marshall *pers. comm.,* 1996).

[18]e.g. Eustathius, *Commentarii ad Homeri Illiadem* (lib.A-P), Vol. 1, page 454, line 13; *Commentarii ad Homeri Odysseam*, Vol. 1, page 176, line 15; *ibid*., Vol. 1, page 176, line 23.

as "dread-eyed," suggesting human awe of the animal (*Halieutica*, V. 35-40) and Ovid appeared to compare "the mighty seal" with the lion and "savage tiger" in its ability to inspire fear (*Heroides*, 10.85-87).

Setting a tone that was to echo down through the centuries, the earliest reference to the sinister nature of the seal occurs in the *Odyssey*, when Artemis, the goddess of hunting, strikes down a maidservant to the king of Syros who had been seduced by a band of Phoenician traders. "The sailors," relates Homer, "threw her overboard to be a prey for the seals and fishes" (*Odyssey*, XV.476).

This curious allusion to seals devouring human flesh is revisited in the epic of Nonnus as he recounts the mythical invasion of India by the forces of Dionysus: "the darting seal entombed the inanimate corpse in her fishy throat and belched out a stream of brownish blood..." (*Dionysiaca*, XXXIX, 222-226; 237-243).

In his poem *The Georgics*, written between 37-29 B.C., Virgil revisits Homer's Old Man of the Sea, Proteus. Again, Virgil reinforces the puzzling human view of the seal as an ugly, and even malignant animal, even though the seal-shepherd himself is held in such reverence. Both the sea god Nereus and the nymphs of the Mediterranean held "Sea-blue Proteus… in honour," writes Virgil, despite the "herds of monsters and hideous seals he pastures in meadows submarine..." (*Georgics*, IV. 388-396).

Similar attitudes were expressed almost 300 years earlier by the poet Theocritus (*c.* 310-250 B.C.). "Proteus herded seals for all that he was a god," sings a young goatherder (*Idylls*, VIII, 51-52). The inference, in this case, is that no one should despise a goatherd lover, for even the mighty Proteus herded animals more offensive than goats (Gow, 1965).

Ovid (43 B.C.–A.D. 17) reinforced such views in another retelling of the legend of the great flood. Where "graceful goats" had once browsed, "Gross clumsy seals hauled their ungainly bulk" (*Metamorphoses*, I, 294-300). Similarly, Latin fragments of unknown origin describe the seal as "foul" and "ugly" (Fragment: SerAet; G3.52.2).

Curiously, even Aristotle may not have been entirely immune to such negative stereotyping, likening the flippers of the seal to "stunted feet" that are deformed or imperfectly developed (*Historia Animalium*, 487b, 20-23). In discussing the movement of snails, he ponders: "Must all this class be regarded as maimed and as moving in the same way as an animal with feet if one were to cut off its legs, or as analogous to the seal and bat, which are quadrupeds but malformed?" (*On the Progression of Animals*, 714b, 9-13).[19]

Aristotle's detailed comments on other aspects of the behaviour and anatomy of the species suggest that he almost certainly observed monk seals on land, and at rather closer quarters on the dissection table (Keller, 1887; Pauly-Wissowa, 1894). Yet, by the same token, we may be permitted to risk the assumption that he never observed the seals swimming, an experience that would surely have dispelled any illusions about the animal's agility, speed and grace. (In contrast, Aelian described how mother seals would gradually accustom their offspring to the sea, a learning process that would eventually make them "excellent swimmers" – *On the Characteristics of Animals*, IX. 9).

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[19] *Cf.* Michael, *In libros de partibus animalium commentaria,* 46,25; ibid., *In librum de animalium incessu commentarium*, 170,19.

Even the great philosopher Plutarch found time to cast another stone at the much-maligned seal. In referring to its perceived medicinal properties, he observes that "...the gall of the hyena and the rennet of the seal – animals unclean in all else – have a certain efficacy in disease..." (*Moralia*, *The Divine Vengeance*, 552 F).

Already owing more to literary hyperbole than accuracy, Homer's immortal testament to the seal's briny rankness found further embellishment at the quills of later writers. The poet Lycophron speaks of "evil-smelling beasts," and Oppian of Apamea, the "Seal of evil smell" (Lycophron, *Alexandra*, 847-850; Oppian, *Cynegetica*, III. 109-115).

Pungent seal metaphors also found their way into satire. Philosophers, politicians, and fellow dramatists were the favourite targets of the most celebrated author of Greek comedy, Aristophanes of Athens (*c.* 445-385 B.C.). In *Wasps* and *Peace*, Aristophanes singles out Cleon for his satirical vengeance, the Athenian statesman who once proposed the execution of all adult males on Lesbos and, in 425 B.C., counselled rejection of peace in the war with Sparta (Speake, 1995), a war that eventually wrecked the Athenian empire.[20] In a dismal reflection of human attitudes towards the species, Aristophanes reserves seal imagery for his most vicious assault against Cleon, describing him as having "the voice of a torrent in destructive spate, the smell of a seal, the unwashed balls of a Lamia, and the arse of a camel..." (*Wasps*, 1030-1036).[21]

Seal metaphors also found their way into the works of Juvenal (*c.* A.D. 55-128), a Latin satirist who enjoyed flourishing popularity for his scathing parodies of the decadence of Roman society. In his third satire, he makes an acerbic attack on the incessant noise that plagued the poorer streets of Rome during the night, from rumbling carts to raucous, cursing drovers (Green, 1974). The commotion, he writes, was enough "To jolt the doziest sea-cow of an Emperor into permanent wakefulness..." (*The Satires*, III, 238). This was a caustic jab at Claudius, who gained notoriety for his cat-napping in public, even during the court cases he was judging. It was also a metaphorical swipe that would not have been lost on Juvenal's audience. The curious, sleepy habits of the seals were already well-known, both from the superstitions of coastal folk who believed that the animals could cure insomnia, and from Pliny's popular *Natural History* (IX.41.2). But Juvenal's joke also packed a doubly stinging blow to the bumbling, much-maligned uncle of the psychotic Caligula. The philosopher and dramatist Seneca the Younger described Claudius' voice as "a kind of hoarse inarticulate bark, like a sea-beast" (Green, 1974).

While most poets, dramatists and philosophers tended to despise the seal and look upon it with repugnance, there were exceptions.

Recounting the legend of Orpheus, Latin poet Valerius Flaccus (*c.* A.D. 40-92) has seals – rather than dolphins, the 'divine' species normally associated with this myth – accompany the Argo on its adventures. The seals are so enraptured by Orpheus' music that they "delight in the Odrysian chant…" (*Argonautica*, 5.439; Wijsman, 1996).

Similarly, early naturalists, particularly those who appear to have observed the species first-hand, could sometimes not help but see the animals in a kinder light, even if their views were occasionally self-contradictory. Lyrical praise and fascination colours

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[20] The Concise Columbia Encyclopedia, Columbia University Press, 1995.

[21] *Cf. Peace*, 754-758.

their descriptions of the mother seal's maternal instincts, for example, including her devotion to raising and teaching her offspring (Plutarch, *Moralia*, *The Cleverness of Animals*, 982 D; Aelian, *On the Characteristics of Animals*, IX. 9). Oppian even compares the seal with the sacred dolphin in the care of its young and paints a romantic, anthropomorphic view of mother seals accustoming their pups to the "works of the deep" (*Halieutica*, I. 646; ibid., I. 685-702).

In some cases such moral, fable-like descriptions may represent a minor current in social attitudes that was gradually overwhelmed by the prevailing tide. This was flowing inexorably towards the de-spiritualising of the natural world in favour of the intensive material utilisation of animals and nature, unencumbered by awkward philosophical or religious concerns. No doubt there were also individuals not destined for fame or enduring prominence in history who shunned this trend and took a compassionate view towards the seals, and animal life in general. As indicated earlier, such sentiments are evident in certain aspects of Neo-Hellenic folklore that appear to take a more compassionate, if anthropomorphic, view of the seal, describing the animal's legendary weeping, and its sadness for humanity's woes (Polites, 1904; Marangou et al., 1995).[22]

A faint trace of such individual trend-bucking can also be found in second century Rome. In his entertaining collection of curious facts and legends, Aelian relates a brief anecdote concerning a seal who befriends a sponge-diver, and we are suddenly presented with an intriguing glimpse of the monk seal's former, friendly and inquisitive nature (*On the Characteristics of Animals*, IV. 56). The hint of mocking cynicism that creeps into Aelian's words as he recounts this particular tale is again typical of the prevailing animosity towards the monk seal. Indeed, evidence indicates that the ill-will that was spurring-on persecution of the species was reaching its height as the Roman sophist penned these words.

With its doctrine espousing human dominion over the Earth, the rise in Christianity tended to reinforce an already firmly-entrenched view that all of creation was subject to human control. St. Basil, seeking to interpret the passage in Genesis that confers upon man dominion over "the fish in the sea, the birds of heaven, and every living thing that moves upon the earth" (*Genesis*, 1,28) suggests that the term "fish" must be taken to mean every creature that lives in the water, including "sea-monsters, whales, sharks, dolphins, seals…" (*Letters*, Letter CLXXXVIII. XV), an interpretation that survives to this very day in Canada, where sharks, whales, dolphins and seals are legally classified as fish under the Fisheries Act, and managed by the Department of Fisheries and Oceans (Lavigne et al., 1999). An almost identical view was espoused by St. Basil's younger brother, Gregorius Nyssenus (*De creatione hominis sermo primus*, 18a, 8).

To another Father of the early Church, Saint John Chrysostom (*c.* 347–407 A.D.), the seal was also a symbol of obesity and gluttony. In a moral diatribe against such sins, he stated: "And to whom is a man cultivating fleshiness not disgusting, crawling as he does after the manner of a seal?" (*In Acta Apostolorum*, 60,256,26).

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[22] Folklore designated as 'Neo-Hellenic' refers to the efforts of cultural anthropologists in the 19th century to gather and record such unwritten literature. Folklore, timeless by definition, was handed down through the centuries by word of mouth, and as such, the origins of any given folk tale, song, or legend remain obscure (D.J.L. Johnson & Tina Marshall *pers. comm.,* 1998).

Negative attitudes towards the species are also found in early Christian-era folklore from Greece. One notable example concerns a woman who dishonoured St. George on his festival day by washing her baby's swaddling clothes at the beach. Angered by her insult, St. George invoked a curse upon her: "May you become a seal and carry your swaddling clothes behind you." Conceivably, the seal's crawling reminded the Greeks of the movement of a woman dragging swaddling clothes behind her (Polites, 1904; Tina Marshall *pers. comm*., 1998).

Distribution and abundance

The accumulated evidence suggests that the Mediterranean monk seal was a species of wide-ranging distribution and abundance in antiquity. Aside from more specific references, the frequency of its appearance in ancient literature, myth and folklore, and the many records describing its exploitation, tend to support this hypothesis. The cities, towns and natural landmarks that were named after the seal may also be suggestive of population distribution and abundance.

Besides Phocis and Phocaea, the seal also lent its name to several other settlements in the region (King, 1956; Ronald, 1973), including towns and villages that were later destined to fall in conquest or other calamity. According to two ancient writers, a now long-extinct town opposite the Aegean island of Samos on Asia Minor's *Caria* coast was also named Phocaea (Stephanus, *Ethnica*, 675,21; Aelius Herodianus, *De prosodia catholica*, 3,1,273,1).

A seal's head, beside a rose and a bee, is depicted on the face of an ancient coin originating from Rhodes (Keller, 1887), though the relationship between the island and its seals, signified by the design, remains shrouded in mystery. It is conceivable, however, that the seal coins issued by such coastal settlements, rather than symbolising a religious totem or reflecting mythological roots, actually reflected the importance of the animal to the local economy.

Some academics have also associated the inland town of Foča in present-day Bosnia with seals (King, 1956; Maxwell, 1967; Ronald, 1973), although this seems a tenuous conjecture at best since the naming of the settlement certainly had entirely different etymological roots. Indeed, the market town on the river Drina was, as late as the 15th century, still known as Hoča, and only later became known as Foča (Jireček, 1952; Belić, 1960; D.J.L. Johnson *pers. comm.,* 1996).

Other clues concerning the seal's abundance in antiquity can be drawn from its recorded distribution in more recent history. Numerous records, ranging from the 16th to early 20th century, document the presence or the killing of seals in locations where they are no longer found today, or where they have been severely diminished (Johnson & Lavigne, *in prep.*). This suggests that, where small subpopulations or isolated individuals continue to survive, these represent the remnants of larger and more numerous colonies that once inhabited such areas.

While the species has disappeared from much of its former range, historically this trend proved most severe along mainland coasts, leaving surviving individuals largely confined to remote island shores and islets inhospitable to humans (Ronald & Duguy, 1979).

In contrast, evidence from antiquity – including the demands of commercially-intensive seal-hunts and the varied locations of those writers who commented upon the species – suggests that *M. monachus* once inhabited all the mainland coasts of the Mediterranean in addition to its major island groups (Keller, 1887).

Some indication of herd size might be drawn from historical accounts from the Middle Ages, recording the discovery of Atlantic colonies that were unknown to the Greeks and Romans. When the first Portuguese explorers reached the remote coasts of the Western Sahara in 1436, for example, they found as many as 5000 Mediterranean monk seals living on sand banks in the bay of Dakhla (da Zurara, 1437). Seals discovered on the islet of *Isla de Lobos* during the Spanish conquest of the Canary Islands in 1402 were prolific enough to sustain a small and profitable industry. "Here there are so many sea wolves," wrote one explorer, "that it seems a miracle, and every year one can earn 500 doubloons of gold or more from the skins and fat" (Monod, 1932; Hernandez, 1986). Similarly, the first Portuguese explorers of Madeira in 1419 were reported to have been "stupefied by the number of sea-wolves they found" (Frutuoso, *c.* 1550; Sarmento, 1948).

The 19th century scholar Otto Keller concluded that the shores of the Aegean Sea were also populated by numerous large seal herds during early antiquity (Keller, 1887), but a closer examination of relevant ancient texts is necessary to determine whether there is sufficient evidence to support such sweeping claims.

Many ancient writers provide no explicit reference to the numbers of seals inhabiting Mediterranean shores, yet this omission might be attributed to a variety of causes. In many cases, such information would have been irrelevant to the written work concerned, or incompatible with its literary style. In other cases, a reluctance to state the obvious, or to set down in writing what was then common knowledge, may have been equally to blame. Indeed, the monk seal may have been so prevalent that, on occasion, they were hardly deemed worthy of mention. The species, for example, was known to Pausanias, who devoted up to twenty years in the second century A.D. travelling through the ancient Greek world. He recorded his observations in a ten-volume *Guide to Greece*, and yet his only reference to the species is that sea turtles "have flippers like seals" (I, 44:8).

The *Odyssey* provides our earliest indication that the species may well have been abundant in the eastern Mediterranean 2,800 years ago. The sea nymph Eidothea is reported to say that when the sea god Proteus emerges from the sea at midday, he will be surrounded by "a throng of seals." After entering the "arching caves," Proteus "will pass along all the seals and count them; then, having viewed them and made his reckoning, he will lie down among them all like a shepherd among his flock of sheep" (*Odyssey*, IV. 398 *et seq.*).

Much, of course, depends on the interpretation of the ancient text and its subsequent translation. In the version quoted above, the word 'throng' is used – literally a 'great number'. Predictably, other translations and commentaries apply different terms to describe the numbers of seals encountered. In his celebrated study *The Greek Myths*, Robert Graves speaks of "hundreds of seals" in Proteus's flock on Pharos (Graves, 1955). George Chapman's 17th century version of the *Odyssey* uses the term 'shoals'.[23] In the

[23]Chapman's Homer, Bollingen Foundation/Pantheon Books, 1956.

1995 Loeb Classical Library edition, the seals "sleep in a herd" and Proteus counts the animals five at a time before laying down to sleep among them.[24]

Similarly, when Aristotle – albeit with certain exaggeration or lack of understanding – describes the animals in fierce and even deadly competition for space and food, the image that is conjured up is also one of large herds of seals: "…for they say that even the seals living around the same place make war, male against male and female against female, until one kills the other or is driven away; and the pups all do the same" (*Historia Animalium*, 608b, 18-26).

Further evidence of the seal's gregarious behaviour in antiquity may be contained in the erroneous observation of Aristotle and Oppian that females can give birth to several pups in each litter (Aristotle, *Historia Animalium*, 566b, 27-33; ibid., 567a, 1-14; Oppian, *Halieutica*, I. 646; ibid., I. 685-702). Modern research indicates that female monk seals and their pups sometimes fail to recognise each other, and as a result, the 'lost' pups will congregate around other females in the colony.

Some four centuries after Aristotle, Pliny the Elder implied that seals, among other marine mammals, were better known to the Romans than many other species in the Empire (*Natural History*, XXXII. 143-144). Aelian described the species as populating headlands and shoreline rocks, and implied that their noisy barks could easily be heard from passing boats (*On the Characteristics of Animals*, IX. 50).

Assuming that the available evidence establishes the probability of the monk seal's abundance in ancient times, what factors drove the species into its decline, and when?

Habitat

Among the numerous forces arrayed against the monk seal, human disturbance and loss of habitat have always ranked highly.

It has generally been assumed that these particular threats achieved unrivalled intensity during the 20th century, and have yet to reach their full destructive potential as urbanisation and mass tourism continue to take their toll. Yet in examining ancient texts and secondary sources, it is clear that the same forces were also much in evidence in antiquity. This appears to have been a gradual process, increasing with human colonisation of Mediterranean coasts, and peaking during the Roman era (Hughes, 1988).

Surveys dating back to the 1960s have demonstrated that surviving seal populations are chiefly confined to rugged island shores and cliff-bound mainland coasts. Notwithstanding the serious threats posed by fishers and pleasure boating, such areas can be characterised as relatively inaccessible or unattractive to human development (van Wijngaarden, 1962; Sergeant, 1979; Ronald & Yeroulanos, 1984).

All available evidence suggests, however, that *M. monachus* originally congregated on open beaches and shoreline rocks for resting, breeding and social interaction (Anderson, 1978; Ronald & Duguy, 1979; Sergeant et al., 1979). The current, virtually exclusive, use of caves by the species appears to be a relatively recent phenomenon, triggered by hunting

[24] Homer, the *Odyssey* (Loeb Classical Library edition, 1995).

Fig. 11. A monk seal pup making use of a small open beach on Hayırsız island in the Foça Specially Protected Area, Turkey. Photo: Cem O. Kıraç.

Fig. 12. Monk seals, including this mother and pup, have recently been observed returning to open beaches on Madeira's Desertas Islands Natural Reserve. Photo: Parque Natural da Madeira – Rosa Pires.

pressures, increasing human disturbance and loss of preferred habitat (van Wijngaarden, 1962; Bareham & Furreddu, 1975; Anderson, 1978 & 1979, Sergeant et al., 1979).

It has been suggested that this enforced retreat may seriously compromise long-term survival of the species. In a study of habitat and breeding viability in a related phocid seal, *Halichoerus grypus* (Fabricius, 1791), Anderson (1979) concluded that caves and narrow cliff-bound beaches must be considered marginal habitats for grey seals. Grey seals breeding in caves were found to produce fewer pups than those using open beaches, a phenomenon mainly attributed to storms and reduced mating success. Pups could often be swept away and drowned in the violent waves and flood tides surging into such caves (Anderson, 1978). Similar mortalities have been observed in seal caves along the *Côte des Phoques* in the Western Sahara (Gazo et al., 1998). Although tide action is negligible in the Mediterranean, storm waves have been observed to pose similar risks to pups even in caves judged relatively favourable by other standards (Sergeant et al., 1979; Mursaloğlu, 1984).

Because of the above considerations, cave-use by Mediterranean monk seals has been characterised as a breeding habitat of 'last resort' that may not be adequate for their survival. Consequently, adequate protection of open, sandy beaches may be necessary in order to encourage the formation of viable breeding colonies (Anderson, 1979; Ronald & Duguy, 1979; Sergeant et al., 1979). Reinforcing this view, mother seals and pups have recently been observed, for the first time in many years, returning to beaches in the strictly-controlled Desertas Islands Natural Reserve of Madeira, and on Hayırsız island in the Foça Specially Protected Area in Turkey (Henrique Costa Neves *pers. comm*., 1998; Harun Güçlüsoy *pers. comm.,* 1998; Figs. 11 & 12). Similarly, seal tracks have been recorded on beaches on Piperi, in the core zone of the National Marine Park of the Northern Sporades (Panos Dendrinos *pers. comm.,* 1997).

While several authors have discussed habitat change in Mediterranean monk seals, and have noted that sea-caves are numerous in the Mediterranean basin (*e.g.* Sergeant et al., 1979), the types of cave utilised by the species have been a largely neglected issue. This is in spite of the fact that, in many areas, increasing human pressure upon *M. monachus* appears to have caused a progressive deterioration in already suboptimal cave habitats.

The great "arching caverns", immortalised by Homer in the *Odyssey*, can be found in many areas of the Mediterranean (Fig. 13), yet most – if not all – appear to have been abandoned by seals long ago because they could offer little security from hunters and fishers or, in more recent times, summer tourists (*e.g.* Bareham & Furreddu, 1975). While their previous inhabitants may have been killed or driven off, other neighbouring seals rarely move in to occupy vacant caves. Smaller caves of the type described by Bahtiye Mursaloğlu (1984) were regarded as characteristic breeding habitat, offering a limited haul-out area, some protection from storm surges and both surface and underwater entrances. Significantly, perhaps, a recent visit to this relatively remote stretch of Turkish Aegean coastline suggested that the 'Mursaloğlu cave' had been abandoned. Caves that are invisible from the sea surface appear to offer the greatest security from human predation and disturbance, and the prevalent use of such shelters was already recorded in the 1960s (van Wijngaarden, 1962). In Turkey, researchers using scuba equipment have located underwater entrance caves with narrow, sinuous channels cutting several hundred metres into cliffs and rock faces. Of those considered capable of supporting monk seals (*i.e.* caves possessing an air supply and a haul-out area), the current maximum recorded tunnel length (*i.e.* entrance to inner cave) stands at approximately 90 metres (Cem Kıraç *pers. comm.,* 1998). Deterioration of habitat is sometimes even more apparent. In recent years, seals have been observed occupying caves that are, in reality, little more than water-filled crevices (Figs. 14 & 15). Offering no beaches or haul-out areas, animals using such shelters are obliged to sleep and rest while floating in pools (Güçlüsoy, 1996; Harun Güçlüsoy *pers. comm.,* 1997; Cem Kıraç *pers. comm.,* 1997).

Fig. 13. The great "arching caverns" immortalised by Homer, once traditional habitats of Mediterranean monk seals, now offer little security from human disturbance. Photo: Matthias Schnellmann.

Fig. 14. Deteriorating habitat: a juvenile monk seal in Greece, sleeping in a water-filled, crevice-like cave, offering no inner beach or haul-out area. Photo: Matthias Schnellmann.

This apparent shift in habitat, gradual by human standards, yet drastic in evolutionary terms, may also shed light on the historical discrepancies surrounding the monk seal's character traits and behaviour.

Today, throughout the Mediterranean, it is rare to hear even of a solitary seal basking on an open beach or clambering onto shoreline rocks. The species is normally characterised as shy, retiring, and craving solitude, behaviour patterns that convinced some naturalists – albeit in error – that the animal was christened the 'monk' precisely because of these reclusive traits (*e.g.* Attenborough, 1987). Yet the modern description of the seal's character and temperament is seriously at odds with many older historical records. Over the centuries, these have portrayed the creature as gregarious, inquisitive, docile, and even mischievous (*e.g.* Brusina, 1889).

A preponderance of evidence suggests that this apparent change in temperament is linked both to human persecution and habitat deterioration. Rather more difficult to assess, however, is whether such behavioural change was driven purely by survival instincts and natural selection, or whether it grew out of the learning experience of individual animals.

As noted earlier, it has generally been assumed that human pressures were actively responsible for driving monk seals from their preferred habitat of open sandy beaches to colonise remote cliff-bound coasts and islands inhospitable to humans. This particular scenario might suggest that the seal's formerly docile and gregarious nature turned increasingly shy and retiring in reaction both to human persecution and habitat change.

While this may seem a compelling argument, there is some evidence to suggest that in ancient times – because of its wide-ranging distribution and abundance – the species may have occupied both types of habitat.

As such, character change in the species may have been provoked by natural selection rather than direct reaction to human persecution. In this scenario, it was the docile, sand-loafing seals that naturally presented the easiest targets for hunters and fishers. Once these had been exterminated, only those animals of a naturally shy and reclusive disposition survived. Various historical accounts record the apparent docility of seals when confronted by hunters. Describing the hunting of seals in Roman times, Manilius states that the unsuspecting animals "deem themselves as safe as in the open sea" (*Astronomica*, 5, 656-665). Portuguese explorers exploiting the 5000-strong seal herd at the Bay of Dakhla in 1436 found the animals "easy to kill" (da Zurara, 1437). Similarly, records from the conquest of Madeira portray sleeping seals "outstretched on the beach... disinterested, not dreaming of the new enemy which was coming to take them by surprise in a barbaric fashion" (Fig. 16) (Frutuoso, *c.* 1550; Sarmento, 1948).

While natural selection may have played a role in eradicating monk seals of a more docile and gregarious disposition, it cannot provide a satisfactory explanation for the progressive deterioration in seal habitat observed in recent history. Furthermore, there is no reason to suppose that the colonies that populated remote areas were any less gregarious than the seal herds that occupied open sandy beaches in closer proximity to humans.

Although seal colonies were observed both in antiquity and in more recent times occupying barren islets, shoreline rocks and promontories (*e.g.* Fig. 17 & Beaufort, 1818),

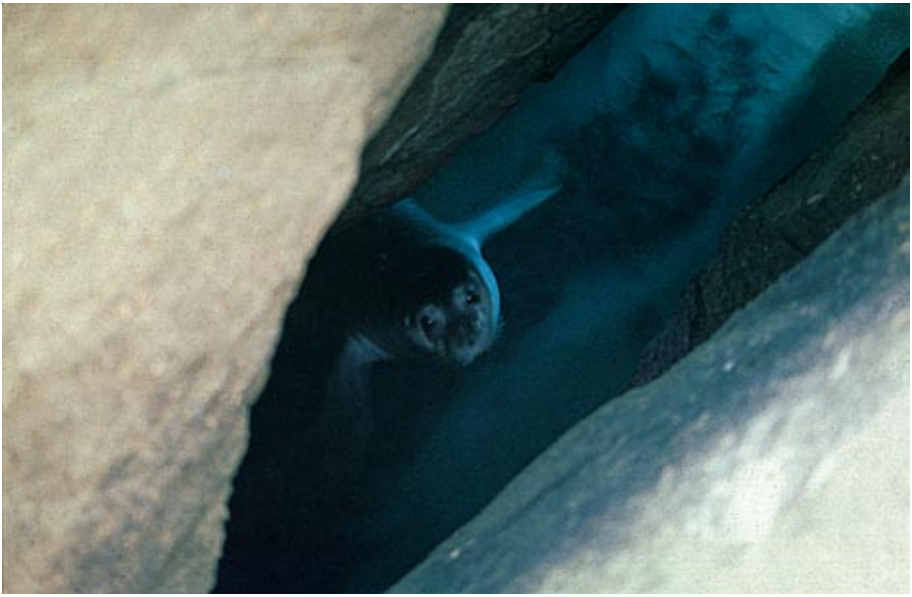

Fig. 15. An adult female seal seeks shelter in a similar cave in the Foça Specially Protected Area, Turkey. Photo: Cem O. Kıraç.

Fig. 16. 19th century gravure depicting the hunting of Mediterranean monk seals.

there is no evidence to suggest that they utilised the inferior caves and crevices recorded as monk seal habitat today. A case in point is the Foça Specially Protected Area on Turkey's Aegean coast, that incorporates the aptly-named Siren Rocks. Here, caves utilised by seals are few in number and limited in size – some, as noted previously, being little more than water-filled crevices (Güçlüsoy, 1996; Harun Güçlüsoy *pers. comm.,* 1997). Such habitat would therefore appear to impose severe limits on carrying capacity. However, a Turkish military coastal survey in 1965 suggests that the use of such marginal habitat is a recent phenomenon. During the survey, 52 seals were counted on the flat beds of stone that form the Siren Rocks (Yurdakul Kabasakal *pers. comm.,* 1995).

Taking all available evidence into account, habitat deterioration driven by human persecution appears to have been primarily responsible for turning a species that once basked on beaches in large numbers into a rare and elusive animal found most often in remote caves. This seems to have been a gradual yet relentless process, one that was forever pushing the species into unfamiliar and increasingly marginal habitats. While the use of caves may have initially aided the survival of the species (Sergeant et al*.,* 1979), those shelters that afforded the greatest security could normally only accommodate a handful of individuals, thereby severely restricting colony size and social interaction. It may therefore be reasonable to assume that the loss of gregarious behaviour not only took its toll upon the seal's tame demeanour for which it was so famed in antiquity, but also had severe repercussions on mating and breeding success, thereby greatly contributing to the decline of the species.

An examination of ancient texts suggests that sandy open-air beaches and easily accessible "arching caves" with sand or shingle haul-out areas, once formed the natural

Fig. 17. A naturalist's gravure (*c.* 1820) depicts Mediterranean monk seals basking on an open beach and shoreline rocks. Photo: David M. Lavigne archive.

habitat of the species. In the *Odyssey*, seals flocked to such great caverns to sleep, finding shade from the noonday sun. The animals lay in rows "along the sands" (*Homer's Odysses, Chapman's Homer*, 595-600) "near the breaking billows" (*Odyssey*, IV. 442 *et seq*.). Echoing Homer's description is the epic poet Nonnus, who speaks of "the sand-loving seals" (*Dionysiaca*, XLIII. 249-252), and the "earth-bedding seal" (ibid., XLIII. 339). Virgil pictures them scattered along the shore: "All over the beach the seals were sprawled for their siesta" (*Georgics*, IV, 432).

Other writers, however, imply that the seals also occupied a broader range of habitat. Aristotle conjures up the image of seal rookeries on rocky outcrops or promontories,[25] observing that both adults and pups would allow themselves to slide down steep inclines

[25] J. Donald Hughes notes that in ancient Greece some cliff-bound coasts, particularly around promontories, were set aside as enclosures sacred to the gods, where hunting, fishing and other human activities were prohibited. This religious motive may therefore have offered some incidental protection to monk seals as long as humans respected the sanctuaries (J. Donald Hughes *pers. comm.,* 1998; Hughes, 1998).

into the sea (*Historia Animalium*, 567a, 1-14). He also observed that the seal "breathes and sleeps and brings forth its young on dry land…near the shore" (ibid., 566b, 27-33).

Another fragment of evidence is imparted by Oppian of Cilicia who states that during the day seals will "abide at their ease on the rocks and on the sands and take their sleep outside the sea" (*Halieutica*, I. 405). The Roman sophist Aelian makes a similar observation, telling us that "Seals emerge for choice [from the sea] when it is dark, although they do in fact sleep on shore at midday" (*On the Characteristics of Animals*, IX. 50). Elsewhere, he described seal herds uttering their loud, ominous cries at passing ships from "headlands and projecting rocks" (ibid., IX. 50), but also described a seal that appeared to live near "a rocky cavern" (ibid., IV. 56). Pliny the Elder provides no specific description of habitat preference, but implies that seals could be seen in open environments, rather than caves: "And sea-calves, called seals, breathe and sleep on land..." (*Natural History*, IX.19.3).

Some authors have suggested that seals may have utilised caves to seek shade from the fierce Mediterranean sun (*e.g.* van Wijngaarden, 1962), behaviour that is also implied by Homer in the *Odyssey*. Notwithstanding doubts surrounding the biological need of Mediterranean monk seals to find shelter from the sun (*e.g.* Bareham & Furreddu, 1975) and numerous recorded instances of seals basking in the sun in apparent contentment, the issue should also be seen in the broader context of changes in Mediterranean environment that have occurred since ancient times.

While bare, arid landscapes and maquis-covered hillsides often characterise the Mediterranean environment today, many mainland and island coastlines were once thickly forested to the water's edge, thereby providing shade to beach-dwelling seals. A significant proportion of these areas were denuded of their forest cover during antiquity, most notably as a result of intensive exploitation during the Roman era (Hughes, 1988). Whether the felling of the trees left seals more vulnerable to overheating (hyperthermia), or further encouraged the use of caves, is open to question.

Regardless, the first signs of human pressure on monk seal habitat may have been evident relatively early in antiquity.

The Homeric *Hymn to Apollo*, of uncertain date and authorship, provides our earliest written record that monk seals inhabited wild, pristine landscapes, far removed from human disturbance. Couched in the description is the derogatory inference that the presence of seals was symbolic of primitive lands untouched by civilisation. In the poem, the goddess Leto, the mother of Phoebus Apollo, sets foot on Delos, and asks the sacred floating island to become the abode of her son, and to house him in an opulent temple. In reply, Delos expresses her fear that her barren landscape will incite the wrath of Apollo. If he were to scorn and turn his back on the island, "many-footed creatures of the sea will make their lairs in me and black seals their dwellings undisturbed, because I lack people" (*To Apollo*, 76-78).

The negative connotations of the seals' presence is even more evident in a 17th century translation of the hymn (*An Hymne to Apollo, Chapman's Homer*):

"For wretched Polypusses breed in me
Retyring chambers, and black sea-calves Den
In my poore soile, for penurie of Men..."

Similar thoughts were echoed by the poet Lycophron in the third century B.C. In his dramatic monologue *Alexandra*, he relates the prophetic ravings of Cassandra, daughter of Priam, the ill-fated king of Troy. A great flood unleashed by Zeus allows seals to return to the richest land once occupied by humans: "...the plashing rain of Zeus laid waste with deluge all the earth. And their towers were hurled to the ground, and the people set themselves to swim, seeing their final doom before their eyes. And on oat and acorn and the sweet grape browsed the whales and the dolphins, and the seals that are fain of the beds of mortal men" (*Alexandra*, 77-85).

In remarking that the seals are gladly "of the beds of mortal men," Lycophron may be making a faint allusion to the competition between humans and seals over coastal habitat, and the relentless march of human colonisation that drove the seals to increasingly remote and inhospitable areas. Similar attitudes are expressed in at least one translation of Virgil's *Georgics*, a poem focusing on farming life. Describing some ill-defined plague that has attacked the land, Virgil (70–19 B.C.) writes: "On the shore's confine the wave washes up, Like shipwrecked bodies: seals, unwonted there, Flee to the rivers" (*Georgics*, 3.541-3 [Greenough]).

Callimachus of Cyrene, a contemporary of Lycophron, provides additional information. In *Hymns*, Callimachus uses the desolate, forbidding habitat of the seals as a striking metaphor for divine retribution against those who have offended the gods: "And Hera was grievously angered and spake to her: 'So now, O shameful creatures of Zeus, may ye all wed in secret and bring forth in darkness, not even where the poor mill-women bring forth in difficult labour, but where the seals of the sea bring forth, amid the desolate rocks.' " (Hymn IV, 238-243).

Increasing colonisation and development of Mediterranean coasts formed only one part of the lethal equation that eventually wiped-out the monk seal herds. Hand in hand with this went hunting, which, through a process of disturbance and extermination, also played a major role in depriving the seal of its original habitat.

Exploitation and hunting

Seals were almost certainly regarded as a valuable natural resource ever since humans first settled around the pristine shores of the Mediterranean. Bones of monk seals, dating back to the Palaeolithic era,[26] were unearthed in archaeological excavations at Grimaldi on the Ligurian coast of Italy, indicating that Stone Age humans hunted the animals for food and clothing (Clark, 1952). A similar conclusion is suggested by the crudely-drawn stone engravings of seals – estimated to be almost 20,000 years old – discovered in 1991 in the *Grotte Cosquer* on the Mediterranean coast of France (Clottes & Courtin, 1994; Hans-Georg Bandi *pers. comm.,* 1998).[27]

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[26]Intriguingly, the Greek poet and philosopher Xenophanes (*c.* 570–*c.* 478 B.C.), is said to have noted the presence of fossilised seals, fish and other marine organisms in the quarries of Syracuse in Sicily (*See* Hippolytus in the Ancient Texts section).

[27]Clottes & Courtin (1994) suggest several reasons for the rarity of marine animals appearing in prehistoric cave art. Like birds, fish may have been viewed as symbolising little prestige among Palaeolithic people, whose cave art often

Seal hunting is also believed to have been an important activity during antiquity, at least for poorer people (Keller, 1887; King, 1956; Ronald, 1973).[28] Conventional wisdom appears to imply that coastal dwellers hunted monk seals for the basic necessities of their own survival – fur, oil and meat – but did not kill them in large enough numbers to deplete or endanger the species (*e.g.* King, 1956 & 1983; Maxwell, 1967; Ronald, 1973).

Examination of the monk seal's appearance in ancient literature, however, suggests that this theory is seriously flawed. Similarly erroneous is the hypothesis of the 19th century scholar Otto Keller, who reasons that the Greeks and far-ranging Phoenicians,[29] in discovering the lucrative benefits of seal hunting, persecuted the animals so zealously that the species suffered a drastic and irreversible decline (Keller, 1887; Pauly-Wissowa, 1894).

There is scant evidence to support such sweeping claims, particularly during this period in antiquity. Indeed, the largest body of evidence points to a different culprit in the plummeting fortunes of the species – Imperial Rome. Pliny implies that the Romans were better acquainted with seals than with many other species in the Empire's colonies (*Natural History*, XXXII.143-144), and it is in this particular chapter that he provides an extensive catalogue of methods utilising the animals for their perceived medical properties, a crucial factor in the decline of the species that we shall turn to in due course.

Subsistence hunting of the animals, an activity that probably remained largely constant throughout the Classical era and much of the Hellenistic age, provided coastal dwellers with some of their most basic necessities in the form of fur, leather, and oil. While seals were also used for medicinal purposes, such exploitation appears to have been relatively minor compared to later centuries. It is also likely that seal meat ended up in the cooking pot, particularly when other food was scarce. While some commercial exploitation may have occurred, most hunting is likely to have been on a local, subsistence scale, with fishers and hunters killing individual seals for their own families, friends, and neighbours. Seal skins were made into shoes and clothing, and the fat used for oil lamps. It is also likely that, for travellers and nomadic peoples along the Mediterranean basin, seal hides offered a durable and waterproof material for the outer skins of tents and awnings (Keller, 1887; Pliny, *Natural History*, II.146.5).

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expressed the religious beliefs, myths and legends of their hunting society. As such, birds and fish rarely feature in such art. Other species, encountered on a daily basis (such as the fox and the wolf – and therefore possibly the seal) are also rarely represented in prehistoric cave art and may have been overlooked precisely because of their abundance. A rise in sea level since the Palaeolithic era, possibly submerging numerous coastal cave habitats of prehistoric tribes, must be considered another plausible explanation for the rarity of marine animals in prehistoric cave art.

[28]Unger (1927) records the existence of a seal sculpture originating from the reign of Ashur-bel-kala of Assyria (*c.* 1074–*c.* 1057 B.C.), son of Tiglath-pileser I (flourished in 12th–11th century B.C.). The round, basalt sculpture, found in Assur, was reported to be 8 cm long and, at the time of publication, was said to be held in Constantinople (Istanbul). No further details were provided and efforts to trace the artefact have, to date, proved fruitless. Unger notes that inscriptions dating back to the reign of Tiglath-pileser I reveal that seals were known to the civilisation from both the northern seas and the Mediterranean. These also describe the animals as being hunted and captured from boats. Based on undisclosed sources, Mohr (1952) concludes that the sculpture represented a monk seal.

[29]Phoenicia was an ancient maritime nation that occupied the coastal regions of present-day Lebanon and parts of Syria and Israel. It consisted of a group of city-states that at their height – between about 1200 and 1000 B.C. – were leading maritime traders in the ancient world.

Yet it was during the Roman era that exploitation of the species reached unprecedented levels, the animals being hunted, captured and killed for a wide variety of reasons. By implication, it is reasonable to assume that large seal herds still existed in this period, simply because of the vast numbers of animals that would have been required to feed the trade. Exploitation of the animal for its fur, oil, and meat continued as it had done for centuries, yet seals were also hunted for their numerous perceived medical properties and their value to magic and superstition. Their live capture for the Roman circus, and the hostility of fishers during one of the most intensive periods of exploitation of coastal fishing grounds, can only have added to the final death toll.

Indeed, ancient texts suggest that the market for seals and their products was so vigorous during this age that the species may have suffered a drastic decline. Though Oppian may have described the seals as congregating on shoreline rocks or loafing on sandy beaches in the mid-second century A.D. (*Halieutica*, I. 405), it is likely that most of the large herds, symbolised in legend by Proteus and his flock, had disappeared by 300 A.D. At that point, the once-thriving seal industry would also have perished, though skins and other seal products would occasionally find their way to market, commanding steep prices that suddenly reflected the relative scarcity of the animal.

Any substantial recovery of the species would not only have been undermined by continued subsistence hunting by coastal dwellers – and possibly the occasional opportunistic crew of a trading ship – but also because of the seal's retreat to increasingly marginal habitat. Deserting beaches and shoreline rocks in favour of more permanent habitation of caves would have offered greater security from human predation, yet this fundamental change in behaviour – as discussed previously – would ultimately take an additional toll upon the species, effectively inhibiting any significant recovery.

Hunting methods

There are few explicit references to the hunting or killing of seals in ancient times, yet those that survive are mainly from the Roman era. Marcus Manilius, who lived during the reigns of the emperors Augustus and Tiberius in the first century A.D., indicates that the seals were hunted with nets, a method also commonly used to ensnare terrestrial animals (*Astronomica*, 5, 656-665; Mair, 1963). Pliny the Elder, coaching his readers on the proven method of dispatching the animals when caught, observes that "Seals are with difficulty killed unless the head is shattered" (*Natural History*, IX.41). In this, Pliny seems to be echoing the words of Aristotle who, almost four centuries earlier, declared: "It is difficult to kill a seal by using force, unless you strike it on the temple, because its body is fleshy" (*Historia Animalium*, 567a). In his second century A.D. treatise on fishing, Oppian of Cilicia reported that tridents, clubs and spears were used to kill seals (*Halieutica*, V. 376-391).

Furs

The earliest references to the human utilisation of seals for their fur originate in the Biblical lands of the 13th century B.C. In certain editions of the Old Testament, it is God himself who commands his chosen prophet to obtain seal skins.[30] Appearing out of a fiery cloud on Mount Sinai, God carefully instructs Moses on the making of the Tabernacle, the portable sanctuary in which the Israelites, fleeing bondage in Egypt, carried the Ark of the Covenant through the desert and towards the Promised Land:

"The Lord spoke to Moses and said: Tell the Israelites to set aside a contribution for me; you shall accept whatever contribution each man shall freely offer. This is what you shall accept: gold, silver, copper; violet, purple and scarlet yarn; fine linen and goats' hair; tanned rams' skins, seal-hides, and acacia-wood..." (*Exodus*, 25, 1-6).[31]

In covering the Tabernacle, God continues, in what is fated to be a long and laborious set of instructions, "Make for the tent a cover of tanned rams' skins and an outer covering of seal-hides..." (*Exodus*, 26, 14).[32,33]

In the *Odyssey*, Menelaus was warned that his efforts to ambush the seal shepherd Proteus would only succeed if he and his comrades disguised themselves as seals to avoid detection. To assist the men in their daring exploits, the sea nymph Eidothea returned to them bearing "the skins of four seals, all newly flayed". She then hollowed out hiding-places in the sea-sand of the cave, made the men lie down side by side and threw a skin over each one (*Odyssey*, IV.432 *et seq*.).

It has been speculated that such cunning tactics to deceive Proteus and his flock may actually reflect a common method in the stalking and hunting of seals in ancient times. Hunters would disguise themselves in seal skins, thereby masking their own human form and tell-tale body scents, and then creep into the herds without alarming them (Pauly-Wissowa, 1894).

"Our lying there might have been intolerable," related Menelaus, "for the hideous stench of the briny creatures distressed us monstrously; who would choose a sea-calf for bedfellow?" (*Odyssey*, IV.432 *et seq.)*. Indeed, the briny odour so traumatised Menelaus' aristocratic nostrils that only the nymph's sweet-smelling ambrosia could remedy his distress. Implicit in this passage is Menelaus' regal disdain for the 'sea calves' and their pelts. This might suggest that seal furs were cheap and plentiful, and as such, were regarded as the inferior garb of peasants and poor fisher folk.

Other writers of antiquity lend credence to this interpretation. In his sprawling poetic tribute to Dionysus, and the god of wine's mythological conquest of India, Nonnus has the inebriated deity declaim: "...bind, I pray, tight over my breast a dapple-back fawnskin, full of the perfume of Maronian nectar; and let Homer and deep-sea Eidothea keep the rank skin of the seals for Menelaus" (*Dionysiaca*, I. 34-39).

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[30]Some editions of the Bible offer different translations, such as 'sea-cow', 'porpoise', and even 'badger'. The International Bible Society version (1973, 1978, 1984) uses the word 'sea-cow' but in accompanying notes interprets the animal as a 'dugong'.

[31]See for *e.g.* 2. Mose, 25.5, Die Heilige Schrift des Alten und Neuen Testaments. Zwingli-Verlag, Zürich, 1966.

[32]See for *e.g.* 2. Mose, 26.14, Die Heilige Schrift des Alten und Neuen Testaments. Zwingli-Verlag, Zürich, 1966.

[33]See also *Exodus* 35.7, 35.23, 36.19, 39.34, *Numbers* 4.6, 4.8, 4.10, 4.11, 4.12, 4.14, 4.25.

In a later passage, Dionysus speculates what gifts Poseidon the Earthshaker might bring to his wedding to Adonis' daughter, Beroë, and we can once again perceive how sealskins were regarded with disdain: "What worthy gifts will Earthshaker bring? Will he choose his salt water for a bridegift, and lay sealskins breathing the filthy stink of the deep, as Poseidon's coverlets from the sea? Do not accept his sealskins" (ibid., XLII. 396-400).

The belief that sealskin was inferior to other types of fur is also reflected in a later passage, in which Dionysus expresses his wish that the proud sea god Proteus appear before him with bowed head, his customary sealskins exchanged for a speckled fawnskin (ibid., XLIII. 75-79).

Writing in the 5th century A.D., Nonnus was perhaps too preoccupied with his mythological nostalgia to realise that a drastic change had occurred during the centuries that separated him from his beloved Homer. It is therefore doubly ironic that, even by the 4th century A.D., the monk seal had apparently become such a rarity that their skins in the Roman marketplace were now luxury items that only the wealthy could afford. This crucial fragment of information is contained in the document known as the *Edict of Diocletian*.

In 301 A.D., the military-elevated emperor Maximus Diocletianus, a former commander of the imperial guard, instituted a command economy in an effort to tame rampant inflation and profiteering by merchants, hoarders and speculators. Warning of "the excesses of unlimited, furious avarice," Diocletian's Edict set compulsory maximum prices for a wide range of goods and services, to be applied throughout the Roman domain. The penalty for infringement, capital punishment, may have been harsh, but it reflected Diocletian's own righteous indignation at the merchants who hoarded commodities in a systematic attempt to drive prices higher. Listing over a thousand different items, the Edict was laboriously copied onto papyrus by scribes, onto painted wooden display boards, and even engraved onto stone tablets which found their way into the eastern reaches of the Empire, including Greece, Egypt and Asia Minor (Radcliffe, 1926).

By comparing the Edict's maximum prices for seal skins with other animal hides, and with wages in the various strata of the social hierarchy (Table 1), we can ascertain just how rare a luxury monk seal skin had become by 301 A.D. At the bottom rungs of the ladder, labourers, herdsmen, mule-drivers, and sewer-cleaners were paid 20-25 denarii a day. Three days of toil were enough to buy a cheap pair of shoes; a month's savings, a shirt. Carpenters, bakers, and elementary schoolteachers could double those salaries; a skilled and respected figure painter might expect 150 denarii a day, and an advocate 1,000 denarii for pleading an entire case. Yet a single untanned seal skin would set them back 1,250 denarii, a tanned hide 1,500 denarii (Diocletian, *The Edict of Diocletian*, C.8). Clearly, this was beyond the means of all but the most affluent (Williams, 1985).

Further indications of the seal's apparent rarity can be drawn from a comparison of the furs and skins listed in the Edict. These range from untanned badger skin at 10 denarii, to tanned leopard skin fetching 1250 denarii. Heading the list, seal skin ranks as the most luxurious commodity, also outclassing the hides of lion, bear, lynx, hyena, wolf, and beaver (Table 1).

While the continued utilisation of seals for medical and other purposes may appear to contradict the hypothesis that the species had suffered a serious decline by the time

Goods and Services	Maximum Prices in Denari	
badger skin, untanned	10	
the same, tanned	15	
beaver skin, untanned	20	
the same, tanned	30	
wolf skin, untanned	25	
the same, tanned	40	
hyena skin, untanned	40	
the same, tanned	60	
lynx skin, untanned	40	
the same, tanned	60	
deer skin (first quality), untanned	75	
the same, tanned	100	
bear skin, largest, untanned	100	
the same, tanned	150	
lion skin, untanned	1000	
leopard skin, untanned	1000	
the same, tanned	1250	
seal skin, untanned	1250	
the same, tanned	1500	
advocate	1000	per case
skilled figure painter	150	per day
carpenter, baker, teacher	40-50	per day
labourers, herdsmen, mule-drivers, sewer-cleaners	20-25	per day

Table 1. From the Edict of Diocletian, 301 A.D. Maximum prices for goods and services throughout the Roman Empire.

of Diocletian's Edict in 301 A.D., several additional explanations validate this conclusion. High prices for goods and services appear to have largely disappeared by the fifth century (*e.g.* Radcliffe, 1926), a date coinciding with the fall of the Roman Empire, and a resultant disruption of economic infrastructure and decline in demand. Surviving seal colonies, while representing only a fraction of the seal herds that inhabited the Mediterranean in earlier centuries, may have experienced some recovery during this period. Another fact to be taken into consideration is that seals obtained on a local subsistence basis would rarely have been subject to the steep prices commanded during the Diocletian period. Furthermore, writers of later centuries who advocated seal-based medicinal remedies, or the utilisation of the animals for magic and superstition, were often compilers who merely quoted or commented upon the works of earlier authorities. While there is evidence to suggest that seals continued to be used for various purposes well into the Middle Ages (Johnson & Lavigne, *in prep.*), the frequency of relevant references to its exploitation declines substantially in writings following the publication of Pliny's influential *Natural History.*

Food

Aside from fur and oil, seals were also hunted as a food source. One of the most outstanding figures in medical science during the Greco-Roman era was Galen of Pergamum, the personal physician of both gladiators and emperors during the second century A.D. Among his prolific writings, Galen turns his attention to food and nourishment, and in quoting and commenting upon the works of Phylotimos, a third century B.C. physician, provides a rare reference to the preparation and cooking of seal meat. Mindful of the potential risks that certain foods posed to human health, Galen/Phylotimos group seals together with whales, dolphins, sharks and large tuna in the category of "fishes with tough flesh" that require special culinary preparation. Seals were "the food of common men," presumably the culinary lot of poor coastal dwellers who could afford nothing better. The flesh was regarded as "distasteful and slimy" and was therefore eaten with mustard and other hot spices to make it more palatable (Galenus, *De alimentorum facultatibus* libri iii, 6,728,9). On the possible medical repercussions of eating seals, Galen/Phylotimos stress the importance of tenderising the flesh to aid digestion, and advise against consuming it in its fresh, unprepared state (Galen, *Werke des Galenos*, Die Kräfte der Nahrungsmittel, 3. Buch, Kapitel 36). The Alexandrian physician Paulus (*c.* A.D. 625–*c.* 690) echoed such thoughts and recommended pickling seal meat, and other species with tough and indigestible flesh (*Epitomae medicae libri septem*, 1.94.1.1).

Religious rites and superstitions

The Mediterranean monk seal undoubtedly provided its most curious benefits to humans in religious beliefs, folklore, and superstition. Since the animals were never known to be struck by lightning, people appeared to believe that sealskin would protect them from what was regarded as a terrifying supernatural phenomenon. Writing in the first century A.D., Pliny the Elder states that men in fear of lightning would seek refuge in "a tent made of the skin of the creatures called sea-calves, because that alone among marine animals lightning does not strike..." (*Natural History*, II.146).

Though registering his own scepticism, the Greek philosopher Plutarch (*c.* A.D. 50–120), also recorded the existence of such superstitions, noting the common belief that lightning "never strikes sealskins or hyena pelts" (*Moralia*, *Table-Talk*, 684 C). Ship-owners, he added, used such pelts to cover their mastheads in the belief that they would offer protection against lightning strikes (ibid., 664 B, C). When allied with the apotropaic powers of coral, seal skin tied to the mast of a ship would also act as a potent amulet against supernatural forces, protecting the vessel against dangerous winds, waves and storms (Orphica, *De lapidibus epitome*, 150,1).

Pliny the Elder also observed that the hides of seals "even when flayed from the body are said to retain a sense of the tides, and always to bristle when the tide is going out" (*Natural History*, IX.42). While Pliny provides no specific reference to sailors making use of this particular phenomenon, later seafarers were reported to utilise sealskin as a kind of barometer. According to the Renaissance scholar of natural history, Konrad

Gesner, "Its hair is reputed to be of such a wondrous nature that the skins or belts are worn by mariners. When thunderstorms, tempests and other inclement weather is nigh, the hair shall rise and bristle, but when it turns still and mild, it shall lay down smoothly" (Gesner, 1563).

The magical properties of sealskin also proved useful to farmers. According to a fourth century A.D. treatise on agricultural pursuits, a seal pelt dragged around a field and then hung at the entrance or yard would save a farmer's crops from hail storms (Palladius, *De re rustica*, 1.35.14). Possibly, this particular superstition can be traced back to earlier times when Apollo and Poseidon were the tutelary gods of the seals. Apollo is known to have used hail as a weapon against those mortals who offended him (Mair, 1989), and peasant farmers may have concluded that the skins would act as a kind of amulet, warding off hail attacks against their fields and houses. Similarly, it was thought that a seal hide cast over a single grapevine would provide a farmer's entire vineyard with a mantle of protection from potentially ruinous hail storms (ibid., 1.35.15). The same advice to farmers is found in the *Geoponica*, a collection of agricultural information compiled around 950 A.D. for the Byzantine emperor (*Geoponica*, 14.3-5; ibid., 33.7). This encyclopaedic work also suggests that perforated seal pelts, stretched over a sieve in which seeds are to be sifted, will act as a remedy against Corn Rust (ibid., 33.7).

The collection of anonymous writings known as the *Anonymi Medici* – dated to late antiquity, yet relating material from earlier medical authorities – suggested that seals, among various animals and plants, were capable of warding off thunderbolts (Anonymi Medici, *Fragmenta varia*, 2, 9).

Such superstitions were not only confined to poor fisher folk and farmers. The Roman biographer and historian, Suetonius (69-140 A.D.), tells us that thunder and lightning also struck terror into the most powerful figure of the Empire, Caesar Augustus, "against which he always carried a piece of seal-skin as an amulet" (*The Twelve Caesars*, II. 90).

Medicinal uses

Popular medicine in the ancient world was also rooted in magic and superstition. Some anthropologists believe they can discern a subtle evolutionary pattern as medical knowledge advanced with awakening civilisation. Animal instinct, which drew humans to fast or gather herbal remedies for their ailments, was gradually supplanted by tribal lore and customs. As these social forces developed, medicine men were turned into powerful figures in tribal society, so that superstition, mythology, and healing became inextricably intertwined. The attempt to harness supernatural powers through rituals, incantations, amulets, and other forms of magic gradually became so predominant that the art of healing often bore little resemblance to its original reliance on animal and herbal remedies. As the power of the priests and magicians grew, so did the bizarreness of the treatments and remedies they touted to their gullible patients (Jones, 1975).

It was not until the Hippocratic age that medicine began to free itself from the shackles of superstition. With influence from Egypt, ancient Greece had already developed a relatively sophisticated medical profession by 400 B.C. Discarding the superstitions once inherent to

the healing arts in favour of 'rational medicine', the mystic healer was gradually superseded by the professional physician and surgeon. Medicine in Imperial Rome, however, remained mired in popular superstition for centuries to come. Failing to develop a scientific medicine of their own, the Romans were generally suspicious of this new breed of professional physician, and resorted to self-healing, magic spells and the remedies peddled by charlatan medicine men (Jones, 1975; Scarborough, 1988).

The nascent medical profession epitomised by Hippocrates and his followers remained faithful to the central tenet of not doing anything to impede the body's own recuperative powers. Physicians would prescribe regimen, rest, warmth, and would utilise drugs – with the exception of purges and emetics – only sparingly. In contrast, bizarre magic rituals and equally bizarre animal remedies were the stock in trade of the latter-day medicine men (Jones, 1975). Held in particular esteem by many classical authors were the Magi, a priestly caste from ancient Persia, whose reputed command of the supernatural and power over demons eventually gave rise to the word *magic*.[34] To relieve a headache, for example, the Magi might prescribe the skin of a hyena's head, to be tied around the head of the ailing patient – a hyena that had to be captured when the moon was passing through the constellation of the Twins, without, if possible, the loss of a single hair (Pliny, *Natural History*, XXVIII, 94). Other ailments called for even more gruesome remedies, such as draughts of blood from the cross or gallows (Jones, 1975).

Like earthquakes, thunder, and lightning, to the superstitious, diseases such as epilepsy and apoplexy were also terrifying manifestations of the supernatural. Struggling against such beliefs were the followers of the Presocratics, philosophers who sought to interpret natural phenomena with rational explanations rather than recourse to old mythological notions and superstitions. Their influence gained new ground, but only sluggishly, having to contend with deeply-entrenched traditions already centuries old (Jones, 1975; Scarborough, 1988; Speake, 1995; Howatson, 1995).

As in any evolutionary process, there was no clear-cut break with the past, the threads of the old and the new tightly interwoven into the fabric of society, its values and opinions governed not only by tradition but also expedience. Though the leading physicians of the day may have despised them, healing methods rooted in superstition continued to flourish, and traces can even be seen in the works of Galen and other prominent practitioners of 'rational medicine'. The reason was as pertinent then as it is today in the age of 'rational science'. As many a modern-day doctor will readily admit, faith in a patient can often work wonders. Indeed, however much they may have scorned superstition, early physicians must have realised its benefits and convenience. In an age when most people were undoubtedly far more credulous and superstitious than today, the power of faith healing and auto-suggestion was just too profound to dismiss (Jones, 1975).

On a more utilitarian level, there was also a thriving market in illness ripe for the picking. Droves of poorly-qualified quack physicians descended on Rome, vying with faith healers and medicine men. With them came new, exotic remedies, their raw ingredients often acquired from street hawkers and travellers arriving from distant parts of the Empire. Among their eager patients, these rapidly grew in popularity.

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[34] The Concise Columbia Encyclopaedia, Columbia University Press, 1995.

Pliny the Elder, perhaps unwittingly, did much to encourage this trend, cataloguing several thousand remedies in his 37-volume encyclopaedia *Natural History* (Jones, 1975). Rather than conducting his own research, he tirelessly amassed recipes, both botanical and zoological, from every source imaginable, including the bizarre concoctions of the Magian priests, for whom he actually professed nothing but contempt. Yet, within a few years, his inventory of remedies had insinuated itself firmly into Roman lore and traditions (Speake, 1995; Howatson, 1995). Pliny's profound influence was also destined to leach down through the centuries, with *Natural History* becoming one of the most widely consulted of all ancient books during the Middle Ages and the European Renaissance, its popularity second only to the Bible and Euclid's treatise on Greek mathematics (Scarborough, 1988). Together with the enduring nature of tradition, and its habit of outliving political systems and clinging symbiotically to new religions, Pliny's influence may be partly responsible for the superstitions surrounding the Mediterranean monk seal that survived into the Dark Ages and the Renaissance (Johnson & Lavigne, *in prep.*).

In terms of its impact on wild animals, the Roman obsession for quack medical recipes and rituals can be equated with today's insatiable demand for magic cures in the Middle East and Asia, where a thriving trade in aphrodisiacs and other dubious remedies is driving some species, like the Siberian tiger *Panthera tigris altaica* (Temminck, 1844), to the brink of extinction. From the sheer abundance of popular remedies involving seal derivatives that have survived the passage of time, it is safe to postulate that the trade in monk seals must have had a severe impact on the species, particularly during the Roman epoch. Utilisation of the seal for medicinal purposes, however, was evident in the earliest medical writings.

The 'Father of Medicine,' Hippocrates (*c.* 460-380 B.C.), utilised seal oil in the treatment of women suffering from "a choking of the womb," or complications arising from the condition. The pungent, "ill-smelling" oil, sometimes mixed with other agents, was burnt for fumigation purposes under the nostrils of the patient (*De natura muliebri*, 26,2; ibid., 34,7). In variations to the fumigation remedy, the skin of seal milk (rennet) was beaten to a smooth consistency, mixed with other ingredients, and then preserved in seal oil; alternatively, seal lungs were burnt with goat dung and cedar dust (ibid., 34,26). The same remedy was to be applied if the dislodged uterus was found to be pressing on the "groins" of the patient (*De mulierum affectibus* i-iii, 203,26; Tina Marshall *pers. comm*., 1996). A separate treatment called for seal fat – among other potable medicines – to be consumed by the patient (ibid., 200,3).

Hippocrates also recommended that seal oil be applied to the nostrils of women who had lost the power of speech while suffering from "suffocation" of the uterus as a result of its dislocation (ibid., 126,15). If the symptoms persisted, seal oil would be dripped onto lighted charcoal on an earthen tablet, the well-wrapped patient encouraged to inhale as much vapour as possible (ibid., 126,21; Tina Marshall *pers. comm.*, 1996). Seal oil was also added to a vapour bath to treat complications resulting from the closure of the cervix, caused by dislocation of the uterus (ibid., 133,60; 133,70). If surgical removal of the foetus was required, Hippocrates recommended that seal oil be applied as an ointment to the inflamed uterus (*De exsectione foetus* 5,5; Tina Marshall *pers. comm*., 1996).

Epilepsy, which struck terror into the hearts of people because of its sinister association with the supernatural, drew scores of imaginative remedies. Praxagoras of Kos (4th century B.C.) advocated everything from burning and incision of patients to the rubbing down of afflicted areas of the body with seal and hippopotamus genitals (Caelius Aurelianus, *De morbis acutis et chroniis* [Ed. Steckerl, 1958], I 4, 133).

While it might be tempting to dismiss such remedies as the concoctions of quack medicine men, the use of seal products to treat epilepsy was also recommended by some of the ancient world's most influential physicians, naturalists, and philosophers.

Aristotle, for example, remarks that "the seal vomits beestings [rennet] when caught; this has curative properties, and is good for epileptics" (*On Marvellous Things Heard*, 835b, 31-32). Theophrastus (*c*. 371-287 B.C.), heir to Aristotle's library and manuscripts, and his chosen successor at the Lyceum, advocated a similar treatment, with seal rennet being mixed with the plant *heraclion* (*Enquiry into Plants*, IX. xi. 3).

A later physician, Soranus of Ephesus (fl. 2nd century A.D.), expressly criticised such treatments, noting "the great harm" that would be inflicted upon the epileptic patient by, among other things, administering "seal's blood, and the taking of rennet" (Caelius Aurelianus, *On Acute Diseases & On Chronic Diseases*, I 4, 116-118; ibid., I 4, 128; ibid., I 4, 135).

Singling out the Alexandrian Greek physician Serapion for a particularly caustic dose of sarcasm, Soranus records the clinical effects that might be expected in treating epileptic patients with seal's rennet: "Like the epileptics themselves, his treatment falls to the ground" (ibid., I 4, 139).

The prodigious use of seal 'rennet' in ancient pharmacology is, in itself, something of a conundrum. Rennet, still used today to curdle milk in cheese-making is, by definition, 'the inner lining of the fourth stomach of calves and other young ruminants'.[35]

This definition, of course, in its strictest sense, cannot be applied to the seal, which possesses only a single-chambered stomach. Although Aristotle described the seal as lowing "like a cow" (*Historia Animalium*, 567a), his descriptions of the anatomy of the species were largely accurate (King, 1956). They were also thorough enough to suggest dissection of seal specimens, a practice performed upon many other species during his zoological investigations on Lesbos with Theophrastus (Scarborough, 1988; French, 1994; Speake, 1995). It is therefore unlikely that either Aristotle or his colleagues erred so grievously as to confer upon the seal a four-chambered stomach. Similarly, it was thanks to its peculiar bovine cry that the seal received its Latin name *vitulus marinus*, or sea-calf (Pliny, *Natural History*, IX.41.2), and there is no evidence to suggest that Roman naturalists suspected the species of having a ruminant-like abomasum (Keller, 1887). Academics, however, have insisted that the word employed by ancient writers must be interpreted as rennet (Pauly-Wissowa, 1894). The authoritative Liddell and Scott Greek-English Lexicon defines the term as "curdled milk obtained from an animal's stomach, containing (and used as) rennet." The most likely explanation appears to be that seal rennet was the partly digested mother's milk found in the stomachs of young animals.

[35]The American Heritage Dictionary of the English Language, Third Edition, 1992.

Seal rennet appears to have been regarded as a particularly valuable by-product, and evidently more efficacious in its medical properties than that offered by its ruminant counterpart. Indeed, the eminent Greek physician and botanist Dioscorides (*c.* A.D. 40 – *c.* 90) even tutors his readers on how to distinguish genuine seal rennet from the fake rennet of other animals, and observes that, ideally, it should be extracted from seal pups before they have learnt to swim (Dioscorides Pedanius, *De materia medica*, 2,75,2.7 *et seq.*; Pauly-Wissowa, 1894).[36] If sufficient numbers of physicians and traders heeded his words, then the impact upon the species, in losing its progeny, may have been substantial.

In discussing the curative properties of seal rennet and other derivatives of the animal, Pliny also indicates that the species was hunted specifically for these substances: "The seal... gets rid of its gall, which is useful for many drugs, by vomiting it up, and also its rennet, a cure for epileptic attacks; it does this because it knows that it is hunted for the sake of these products" (*Natural History*, VIII.111).

Pliny appeared to believe that the seal expelled its bile and rennet out of spite, or as a last-ditch defense ploy when captured. Even Plutarch, fighting shy of superstition at another philosophical conversation at the dinner table, ponders the "many phenomena whose causes we cannot discover, such as... the seal's swallowing its rennet when captured" (*Moralia*, *Table-Talk*, 700 C, D. The use of the term 'swallowing' rather than 'expelling' appears to have been a simple error on Plutarch's part).

A later writer, Aelian (*c.* A.D. 170–235), found this behaviour particularly abhorrent, declaring: "The Seal, I am told, vomits up the curdled milk from its stomach so that epileptics may not be cured thereby. Upon my word the Seal is indeed a malignant creature" (*On the Characteristics of Animals*, III. 19).

This particular superstition evidently had much older roots since, according to Photius, Theophrastus specifically challenged it in the fourth century B.C. To Theophrastus, those accusing the seal of spite or envy were being led astray by their own anthropomorphism. Rather, it was doubtlessly fear that provoked the seal to vomit its first milk during capture (Photius, *Bibliotheke*, *Théophraste*, VIII, 278.528a).

Three centuries after Aristotle turned his attention to the disease, the same remedies against epilepsy can be found in the writings of Dioscorides, Pliny the Elder, and their contemporaries. Dioscorides cites seal rennet as a powerful drug when consumed by patients suffering from epilepsy (*Euphorista vel de simpliciis medicinis*, 1,19,2,5; 1,20,2,1) and "hysterical choking" (ibid., 2,75,2.7 *et seq.*; ibid., 2,92,1,3) – a blockage or disruption of the cervix, a condition discussed at length in Hippocrates' gynaecological works cited earlier (Tina Marshall *pers. comm.,* 1996). Among other substances, Dioscorides also lists seal rennet as effective in treating lethargic fever when applied directly to the patient's nostrils (ibid., 1,14,1,3) or inhaled as a fumigant (ibid., 1,15,1,7). Seal fat was also recommended by Dioscorides as an ingredient in an ointment to treat leprosy (ibid., 1,121,3,8).

In his work on the nature and powers of simple medicines, Galen (*c.* 129-204 A.D.) stated that seal rennet possessed the same potency as castor (the aromatic secretion of

[36]A 17th century English translation reads: "Now (this Sea-calves Rennet) is taken from ye young ones when not yet able to swimme together (with ye old)." (Dioscorides Pedanius. De materia medica. *In:* The Greek Herbal of Dioscorides. Ed: Robert. T. Gunther).

the anal glands of a beaver) in treating various diseases (*De simplicium medicamentorum temperamentis ac facultatibus* libri 12, 274, 17).[37] Discussing rennet in general terms in his preceding chapter, Galen observed that it possessed a sharp and discutient power (*i.e.* dissipating swellings, *etc.*) aiding the treatment of epileptics and menstruating women. Where rennet was applied, it caused drying. It clotted milk in the stomach and dissolved clotted blood in the stomach when drunk (Tina Marshall *pers. comm.,* 1996).

While some seal-based therapies had endured for several centuries, many new and imaginative variations were added to the Roman pharmacopoeia. Pliny repeats Theophrastus' seal rennet and *heraclion* plant remedy in treating the dreaded affliction of epilepsy (*Natural History*, XXVI.113-114), but also records other prescriptions. "Epilepsy," he notes, "is treated by doses of seals' rennet with mares' or asses' milk, or with pomegranate juice... Some too swallow the rennet by itself, made up into pills" (ibid., XXXII.112).

In Pliny's expansive pharmaceutical catalogue, the seal also offered many other cures and remedies. A gouty foot, he recommends, should be rubbed with seal fat, and the patient shod with beaver or seal skin (ibid., XXXII.110). For the treatment of quinsy (an inflammation of the tonsils and surrounding tissues), the herb *peucedanum* is mixed with seal rennet in equal parts (ibid., XXVI.23). Patients with tetanus will "find relief with an obolus by weight [approx. 0.568 grams] of seal rennet taken in wine" (ibid., XXXII.120).

Similarly, ringworm and leprous sores could be removed with the fat of the seal (ibid., XXXII.83), which apparently also offered a treatment for rabies. Writing of remedies common in Egypt and around the Nile, Pliny remarks: "When the bite of a mad dog causes a dread of drink they rub the face with the fat of a seal, with more effect if there are mixed with it the marrow of a hyaena, mastic oil and wax" (ibid., XXXII.57). Such treatments were often enduring. Aetius Amidenus, a physician of the 6th century A.D., advised that if patients suffering from hydrophobia were wrapped in seal, bear and hyena skins, they would be swiftly brought back to their senses (*Iatricorum*, liber vi, 24.121).

No doubt drawing on Hippocrates' gynaecological works, Pliny notes that seal fat could also revive fainting women suffering from uterine ailments. "The fat of the seal melted in the fire," he writes, "is inserted into the nostrils of women swooning from hysterical suffocation, or else seal's rennet used as a pessary in a piece of fleece" (*Natural History*, XXXII.130).

Though far less tolerant of the concoctions touted by the Magian sorcerer-healers, Pliny nevertheless included them in his compendium. Labelling them "fraudulent charlatans," he records the Magian treatment for gout, a boiled-up concoction that included the ash of a hyena's spine, "with the tongue and right foot of a seal" (ibid., XXVIII.94-96). Pliny also records the Magi's treatment for drowsiness and fatigue, with patients being roused by smelling the pungent rennet of a seal (ibid., XXXII.116). Paradoxically, because of its infamously sleepy habits, the right flipper of a seal, when placed under the pillow, was thought to cure insomnia (ibid., IX.41.2).

Seal fat was an ingredient in Galen's ointment to treat baldness, a therapy also utilised by the physician Andromachos the Younger (*De compositione medicamentorum*

[37] *Cf.* Dioscorides Pedanius, *De materia medica*, 2,75,2.7; Paulus, *Epitomae medicae libri septem*, 7,3,16,167.

secundum locos libri x,12,438,17). The same treatment was advocated by the Alexandrian physician Paulus in the 7th century A.D. (*Epitomae medicae libri septem*, 3.1.4.5).

Among other ingredients, Galen added six uncias of seal fat (approximately 164 grams) to a liniment to treat painful sinews, arthritis and gout (*De compositione medicamentorum per genera* libri vii,13,1021,12). In the *Pseudo-Galenus* collection of medical writings, sufferers of gout were advised to line their sandals with seal skin (*De remediis parabilibus libri* iii, 14,566,16). While Pliny may have frowned upon them, the more bizarre rituals and concoctions found favour among other writers and practitioners of the healing arts. In his book *Therapeutica,* the Byzantine physician Alexander of Tralles (*c.* A.D. 525-*c.* 605) presented "an often praised and very proven panacea against podagra," or gout of the foot and big toe. The convoluted remedy called for the tendons of a wild donkey, a boar and a stork, to be wrapped into a seal skin and then attached to the feet of the patient when the astrological signs were judged propitious (*Therapeutica*, 2, 579). Perhaps mercifully for those forced to arrange or undergo such treatment, he subsequently noted that a simple prophylactic remedy against gout of the feet and hands "is the skin of a seal, which one lays under the soles..." (ibid., 2, 581).

Physicians who took a more rational approach to medicine occasionally recorded their scepticism of such practices. Like similar treatments that called for hyenas or wolves to be boiled alive in oil, Soranus of Ephesus (2nd century A.D.) cautioned that treating podagra with seal skin and fat was a remedy that would "win adherents on specious grounds and without good reason…" (Caelius Aurelianus, *On Acute Diseases & On Chronic Diseases*, V 2, 48).

In the Hippiatrica, seal fat forms part of three veterinary treatments for horses, including hoof disease (*Hippiatrica Cantabrigensis*, 41,1,5; 80,23,8) and malignant mange (*Hippiatrica Parisiana*, 306.2). Illustrating again the enduring nature of seal-based remedies, the 7th century A.D. physician Paulus of Aegina quotes Dioscorides and Galen on treating bowel ailments and dysentery with seal rennet (*Epitomae medicae libri septem*, 7,3,16,167).

Rather more remarkably, there is evidence to suggest that such remedies also persisted into the 20th century, albeit on a much-reduced scale. Goat-herders on the Greek Aegean island of Samothraki utilised seal fat in rudimentary veterinary care during the 1980s and were quoted as praising its efficacy in treating festering open wounds in their animals (Ronald, 1980). More recently, older inhabitants of some villages on the Bodrum Peninsula in Turkey were found to be using seal skin to cure an ailment known locally as 'foça illness'. This unidentified condition is said to manifest itself in swelling of the face, ears and mouth, sometimes with the added symptoms of inflamed skin and facial boils. Its peculiar local name reflects the conviction among villagers that only monk seal skin can provide an effective remedy for the disease. In treating the condition, small amounts of hair are clipped away from the seal skin, and mixed with a native herb and crumbled cow faeces. It is then burned in a cup, the patient inhaling the vapours with a towel or cloth covering their heads. If available, seal oil is applied to the facial boils or inflammations (Kıraç & Veryeri, 1996).

Live capture

For a species long scorned and vilified, it was perhaps inevitable that the monk seal would also be destined to suffer abuse and public torment in the Roman circus and amphitheatre. More than any other single factor, it is this icon of popular Roman culture that can provide an unambiguous reflection of prevailing human attitudes towards nature and animals, and the scope of that civilisation's exploitation of wildlife.

Circuses and amphitheatres were built throughout the Empire, many becoming the pet projects of individual emperors, such as Julius Caesar's Circus Maximus, the Circus of Caligula, and Vespasian's Coliseum, whose modern day fame in tourist itineraries has eclipsed its former, blood-stained infamy.

On a deeper psychological level, the circus beast fights (*venationes*) epitomised the Romans' ultimately futile quest for supremacy over nature. The need to consummate this in symbolic form, and to satisfy the public craving for entertainment and escapism, led to increasingly cruel and blood-thirsty displays. The tests of stamina and skill in athletics and chariot racing inherited from the hippodromes of ancient Greece gave way to gladiatorial contests, animal baiting and finally, the wholesale carnage of both human and beast under the guise of 'hunting' and 'sport'. The resulting crowd frenzy only led to demands for more, demands that even an emperor-god would have been foolhardy to deny (Johnson, 1990).

Under Nero in the 1st century A.D. even the torture of Christians became a star attraction at Caligula's circus on the Vatican, but still the ever-intensifying thirst for sensation could not be slaked. The carnage in the Roman circus and amphitheatre was to span over 600 years, a stark reflection not only of Roman hubris, but also of the moral decadence which ultimately brought mighty Rome to its knees.

"The vast numbers of animals," observes the historian H.H. Scullard, such "as elephants, lions, tigers, leopards, panthers and hippopotami, that had to be shipped to Rome to gratify Roman cruelty gave rise to a large-scale trade in wild-beasts" (Scullard, 1972). Indeed, even by today's standards, it was an exploitation of astronomical proportions, and may even have acquainted the Romans with the concept of species extinction (Hughes, 1988).

The forests and mountain slopes of the Mediterranean provided habitats for a wide variety of animal life, and were thus a rich source of supply for the circus animal dealers. Bears, wild boars, horses, bison, and red, fallow and roe deer all roamed these relatively pristine landscapes. Among predatory species, there were lions, leopards, lynxes, hyenas and wolves. Across the sea, the grasslands of North Africa were home to elephants, rhinos, zebras and antelopes; hippopotami and crocodiles were a common sight in the Nile. A vast organisational apparatus was established to capture and transport such animals, and to keep the Empire's amphitheatres well-stocked with victims. Powerful, private syndicates dominated this highly-lucrative enterprise, and because the passion for the blood games consumed commoners and emperors alike, the animal round-ups were ably assisted by the army (Hughes, 1988). Trapped with nets and snares, the animals would then be carted back along the supply route, a long, arduous journey that led to their ultimate torture and demise in the arena. Countless animals would also have perished during capture and transport, driving the final death toll even higher (Johnson, 1990). Local citizens in the

towns and villages that the convoys passed through were press-ganged into feeding and housing the animals (Hughes, 1988). Those that survived the gruelling journey would be deposited in sprawling menageries, such as the one outside Rome's Praenestine Gate which served the Coliseum. Those animals slated for imminent slaughter were stored in huge underground vaults burrowed out under the amphitheatre arenas (Murray, 1973; Johnson, 1990). When their turn came, they would be winched up into the ring through mechanical trap doors, suddenly appearing – no doubt bewildered and terrified – before the bellowing masses in the grandstands (Johnson, 1990).

Military victories and religious festivals were celebrated by an orgy of killing in the arena, which in itself speaks volumes about the collective psychosis which so insidiously gripped the Empire. In 55 B.C., at the inauguration of Pompey the Great's amphitheatre in Rome, officials offered 500 lions, 410 leopards and 17 elephants. Similarly, at the dedication of the Coliseum by Titus in 80 A.D., 9,000 wild animals were sacrificed in a spectacle lasting a hundred days. On another occasion, to celebrate a military triumph, 11,000 animals were destroyed. It is recorded that the emperor Commodus, in the second century A.D., even killed elephants, hippos, rhinos, tigers, bears and lions with his own hands in the Coliseum. In the space of a single day he supposedly massacred 100 bears, and on another afternoon's sport, finished off, using different weapons, 100 lions that he had ordered be turned loose against him (Johnson, 1990). In one great festival, notes the circus historian Marian Murray, enough animals were killed to stock all the zoos of modern Europe (Murray, 1973).

For the sake of prestige, it also became fashionable for the rich and famous to keep their own menageries of exotic species. Several prominent figures were even known to show-off about town with lions, tigers or stags drawing their chariots (Murray, 1973). Octavius Augustus (63 B.C.–A.D. 14), during his relatively brief fifteen-year reign as emperor, collected over 3,500 animals, including 420 trained tigers, 260 lions, 600 African leopards and cheetahs, and the first hippopotamus ever to be seen in Rome. The emperor who wore a seal amulet to ward off his terror of being struck by lightning, is also reported to have kept monk seals as exotic pets (Ronald & Duguy, 1984), although this particular claim could not be independently verified.

In a deceptively innocuous account of monk seals entertaining the crowds, Pliny the Elder emphasises the docility and intelligence of the animals, and their ability to perform tricks for their audience. Whereas certain species, he observed, remained unteachable, animals such as elephants, lions and seals could be tamed (*Natural History*, X.128). As a result of their training, he wrote in a subsequent chapter, sea-calves could "be taught to salute the public with their voice and at the same time with bowing, and when called by name to reply with a harsh roar" (ibid., IX.41).

It is likely that the monk seal entertained the crowds at many of these gory tributes to the might of Rome, yet one can only guess at the number of individual animals that met their deaths in the sand-filled arenas.

Animal baiting was considered a particularly spectacular circus attraction and, in typical Roman fashion, this too was conducted on a grand scale. Antelopes were driven to butt each other to death, and elephants and rhinos goaded to attack and maul one other (Murray, 1973). Nor was the monk seal spared such imaginative cruelties.

Waxing lyrical after a day at the circus – a visit that probably took place between 50 and 60 A.D. – poet Calpurnius Siculus expressed his dazed wonderment at the exotic beasts that emerged from the cellars beneath the arena: "Nor was it my lot only to see monsters of the forest: sea calves also I beheld with bears pitted against them..." (*Eclogues*, 7, 65 f).

Over a hundred years later, Oppian, no doubt taking great liberties with poetic licence, described another seal and bear baiting contest. Clearly impressed by the ferocious predatory instincts of these wild sea beasts compared to their terrestrial cousins, he writes: "Before the dread-eyed Seal the maned bears on the land tremble and, when they meet them in battle they are vanquished" (*Halieutica*, V. 35-40).

Under the orders of Nero (A.D. 37–68), an arena was flooded so that he could watch polar bears catching seals (Hughes, 1988), though whether they were unleashed against monk seals or another pinniped species remains uncertain.

If animals were particularly exotic or rare, they would often face only the indignity of public display rather than torture, mutilation and death (Hughes, 1988), and this particular circus custom may thus provide another clue, *albeit* faint, regarding the seal's abundance during this period.

Successive emperors continued to pander to the cruelty and blood-lust of the mob. With virtually the entire empire obsessed by the circus, the number of official commemoration days set aside for public indulgence in the games became increasingly extravagant (Scullard, 1972). As the Roman satirist Juvenal (A.D. 60-130) wrote of his fellow countrymen, with acid sarcasm: "The people that once bestowed commands, consulships, legions and all else, now meddles no more and eagerly longs for just two things, bread and circuses."

All told, literally hundreds of thousands of animals were sacrificed to Roman hubris in the Empire's numerous circuses and amphitheatres. Add to this the systematic destruction of habitat, animals killed during capture and transport, animals hunted for food and medicine, animals killed to protect farmland, and last but not least, the irrational lust for killing anything wild, and the death toll must have soared to unimaginable levels.

As a direct consequence of both the Roman war on wildlife and earlier onslaughts by the ancient Greeks, several large species were driven into extinction around the Mediterranean basin. Classical literature contains numerous references to species in specific geographical areas where they can no longer be found today. Herodotus, for example, provides a graphic account of an attack by lions in Greece (*The Histories*, 7.126). Minoan-era frescoes from the Greek island of Thera depict antelopes, which today are only found in East Africa. Similarly, the lions, leopards, elephants, rhinos, hippos and zebras that were once found around the Mediterranean basin have all long disappeared. "Many of these creatures were extirpated in the ancient period," writes the historian and ecologist J. Donald Hughes, "and almost all were seriously reduced in number. Hunters, freed from any primal respect for living things, destroyed the game, especially the large predators, beyond the point where animal populations could renew themselves. By the end of the Hellenistic age, there were no lions left in Greece, and wolves and jackals were rarely seen outside the mountains." The animal trade for the Roman arena, he adds, "had a disastrous effect on the population of larger mammals, birds, and reptiles. The Hyrcanian tiger was no longer to be found, and hippopotamuses were evicted from the lower reaches of the

Nile. The North African herds, once as plentiful as those in present-day Kenya, were devastated" (Hughes, 1988). Almost certainly, the monk seal herds suffered a similar fate during the same period.

Although the deeper motivations for such destruction remain elusive, it may be particularly significant that even the most powerful men in the Empire were haunted by malignant superstitions and intimidated to the point of terror by lightning and other unexplained natural phenomena. The ritual carnage of animals in the arena may have served a politically expedient purpose in reinforcing patriotism to the state through celebration of Roman military might, but on a deeper level, it may also have represented a defiant show of force to the earth's daunting and capricious supernatural powers.

Though the Romans were progressively embracing Stoicism as their creed, teaching that the gods did not conspire or meddle in human lives, and that freedom from superstitious fears could be sought in the rational interpretation of natural laws (French, 1994), the old traditions remained stubbornly entrenched. Bearing in mind that animals were often thought of as the instruments of omens and magic, the amphitheatre arena may thus have provided the perfect forum for the Empire to demonstrate its Stoic supremacy over nature, and also its brittle courage towards unexplained natural phenomena. In this respect, it may be especially significant that many circus acts were purposely contrived to humiliate their animal captives before they were finally slain (Johnson, 1990).

Ironically, it was precisely these natural powers which in the end helped to bring the mighty civilisation to its knees. The ecological holocaust that the Romans wreaked gradually enfeebled the Empire's entire system, rendering it far more susceptible to other threats, including the onslaughts of the barbarians (Hughes, 1982 & 1988). The flamboyant display of human power over nature was not only evident in the circus and animal trade but was practised with a vengeance against the wilderness itself. Entire forests were razed to feed Rome's ravenous economy and war machine, turning a green landscape into desert and dust, a legacy so enduring that it can still be seen today in countless arid Mediterranean landscapes. It pursued a scorched earth policy in battle to deny food and resources to the enemy; leached the earth of its nutrients in careless farming, and established the forerunner of the industrial farm, planting vast tracts with cereal monocultures. It polluted the air, earth and groundwater with metal smelting and mining, poisoned its citizens with lead cooking utensils, dishes, pots and water pipes, and subjected them to disease-breeding urban overcrowding. Sowing the seeds of such environmental havoc, it reaped severe erosion and flooding, and general economic mayhem that manifested itself in political instability, food shortages and skyrocketing prices for wood, farm products and other vital natural resources. Even the elimination of predator species took its inevitable toll, with farmland facing plagues of mice, rats and other pests (Hughes, 1982 & 1988; Johnson, 1990).

Though the effects of such mayhem were actually first experienced relatively early in the ancient Mediterranean world, they reached, Hughes (1988) concludes, "a devastating level by the time of the late Roman Empire." Attitudes and philosophies merely advanced the process. Supreme self-confidence in this domination over the earth was epitomised by the orator and philosopher Cicero (106-43 B.C.) who wrote: "We are the absolute masters of what the earth produces... by our hands we endeavour, by our various operations on this world, to make, as it were, another nature" (*On the Nature of the Gods* II, 39, 45, 53).

Significantly, it was not any moral enlightenment, nor the impact of Christianity which finally put a stop to the massacre of animals in the circus, but simply a chronic shortage of victims. "These ghastly displays, with their degrading influence on spectators lasted for centuries," writes Scullard (1972). Even the Christian emperors were reluctant to move against the circus, for fear of inflaming an already restless populace. Only in A.D. 326 did Constantine repeal the law which decreed that an unarmed man could be condemned to meet wild beasts in the arena, though the 'hunting' of wild animals in the Coliseum continued – albeit on a reduced scale – until the sixth century because no emperor, whether Christian or pagan, dared to deprive the public of their favourite spectator sport (Scullard, 1972; Johnson, 1990).

Indeed, there were few protests against such fanatically popular massacres. Scullard (1972) remarks: "An age which was apparently unmoved when 6000 of Spartacus' followers were crucified along the Appian Way, is not likely to have been affected by the sufferings of animals, but it is good to know that at least once some qualms were felt. When at the games which celebrated the dedication of Pompey's gift to Rome of her first stone theatre in 55 B.C., 500 lions and 17 elephants were slaughtered, Cicero wrote, 'What pleasure can it give to a cultured man to see weak human beings mangled by a powerful wild-beast or a splendid animal transfixed by a hunting-spear?' " Pliny the Elder records that the spectators were so moved by the pitiful sight of the dying elephants in the arena that they rose as one man and damned Pompey: "But Pompey's elephants when they had lost all hope of escape tried to gain the compassion of the crowd by indescribable gestures of entreaty, deploring their fate with a sort of wailing, so much to the distress of the public that they forgot the general and his munificence carefully devised for their honour, and bursting into tears rose in a body and invoked curses on the head of Pompey for which he soon afterwards paid the penalty" (Scullard, 1972; Johnson, 1990).

Similar compassion, this time for the monk seal, was expressed by Philostratus, a Greek sophist living in the third century A.D. In his *Life of Apollonius of Tyana,* Philostratus quotes the ascetic Greek philosopher on the sentience of animals, and the parental care common to all mammals. In so doing, he provides us with what is probably the first written account of a monk seal pup dying in captivity in the circus: "For I once saw a seal that was kept shut up at Aegae in the circus, and she mourned so deeply for her whelp, which had died after being born in confinement, that she refused food for three days together, although she is the most voracious of animals" (*The Life of Apollonius of Tyana*, II. 14, 54).

Fisheries

Apollonius' choice of adjective in describing the appetite of the monk seal may be particularly significant, judging from the grumbles and curses that still resound through fishing villages in the Eastern Mediterranean. To many fishers, the monk seal is a cunning and incorrigibly greedy foe, stealing fish out of the mouths of their wives and children, and tearing their nets to shreds (Johnson, 1988). Many of the prejudices against the species that were so typical of antiquity persist to this very day, even though they may be as self-deceiving as

any ancient superstition. In much the same way that Aelian spoke of the seals as a harbinger of doom, so the Mediterranean coastal fishers of the 20th century blame the species for their poor catch, or their tattered nets (even though net damage can be caused by a wide variety of factors), and angrily portray the animal as a pest that must be exterminated. Yet in refusing to face up to this self-perpetuating myth, it is possible that fishers are actually becoming a party not only to the extinction of the Mediterranean monk seal, but to their own livelihoods as well. In turning the species into a convenient scapegoat for their own economic woes, coastal fishers may be unwittingly diverting attention away from more urgent problems that confront them, such as industrial overfishing and illegal fishing methods. In many areas, as a result of intensive coastal trawling and other commercially-intensive methods, fishing grounds have been seriously depleted, or have even been brought to the verge of collapse. The use of small-mesh nets in fish spawning grounds has exacerbated the problem, as has the illegal – though all too prevalent – practice of fishing with dynamite and poisons (Karavellas, 1994; Zavras, 1994; Anon., 1995).

Intriguingly, an examination of ancient texts indicates just how little such issues have changed in over a thousand years of history.

Fishing played a vital role in the economy of the ancient world, possibly more so than today (Rostovtzeff, 1941). The staple diet for most people, whether rich or poor, consisted of bread and fish, olive oil and wine. Escalating demand gradually gave rise to a thriving fishing industry, no longer dominated by local fishers and their small wooden boats, but by powerful traders and exporters. A rich variety of fish and other seafood was sold through local markets and auctions, either fresh or salted, pickled or dried. Athenaeus (*c.* A.D. 170–*c.* 230) bequeathed to posterity the dining menus of the Greek and Roman nobility and indicated that their banqueting tables gained notoriety for the numbers and species of fish that were served (Radcliffe, 1926; Rostovtzeff, 1941).

As Rome reached the heights of its fatal decadence, such vast quantities of seafood were required to satisfy demand in towns and cities that certain coastal fishing grounds may have been seriously depleted. If so, competition among fishers, and the struggle to maintain even a subsistence catch, would almost certainly have resulted in the killing of seals as fish-devouring pests.

Like many other influences that breathed life into the civilisation of ancient Greece, the art of fishing too, originated in Egypt. In the rich fishing grounds of the Nile delta, almost every kind of fishing net known to later antiquity was used, including the hand net, the cast net and seine net (Radcliffe, 1926). With its great reed and papyrus marshes, the Nile was an important freshwater ecosystem and spawning ground, and also home to countless water birds. Though little trace of them can be found today, in the Bible, Isaiah refers to the marshes as "the land of whirring wings" (*Isaiah*, 18:1; Hughes, 1988). Fishers stitching and knotting their nets on Egyptian shores must have been as common a sight as in the Aegean today, judging from the needles that archaeologists have unearthed. These are of a simple but effective design, fashioned from a flat piece of pointed bone, with a pierced 'eye' (Radcliffe, 1926).

In the *Iliad* and the *Odyssey*, there are several references to men fishing with spear, net, hand-line and rod (Radcliffe, 1926). Though Homer employs them as metaphors and similes, they offer an intriguing intimation that fishing methods in early antiquity may

have been more intensive than generally assumed: "They were like the fish that fishermen with their close-meshed nets have drawn out from the whitening sea on to the curving beach; they are all heaped upon the sand, longing for the sea waves, but the sun beats down and takes their lives" (*Odyssey*, XXII. 386).

In the *Iliad*, Homer even uses fishing as a simile for the destruction of war: "Beware the toils of war... the mesh of the huge dragnet sweeping up the world, before you're trapped, your enemies' prey and plunder..." (*Iliad*, V. 487 *et seq.*).

Yet curiously, Homer makes no reference to fish being served at the feasts of his golden heroes, or other members of the nobility. Athenaeus observes that the epic poet "never mentions such food in connection with banquets, evidently because these viands were not considered appropriate to the heroes of high rank..." (*Deipnosophistae*, I. 13). Some scholars postulate that fish at this time bore a certain social and religious stigma, and that they were considered fit only for the fishers themselves, the poor and starving (Radcliffe, 1926). Presumably coastal dwellers of lower social caste could not have been expected to shun this important food resource (Grant & Kitzinger, 1988). Yet in the *Odyssey*, Menelaus and his companions only resort to catching fish with hook and line when they are stranded on the island of Pharos and are nearing starvation (*Odyssey*, IV.368). Such noble warriors, glorifying in the trials of strength, stamina, and skill epitomised by battle and the hunting of wild beasts, may have looked upon fishing as an undignified and menial pursuit (Radcliffe, 1926). In Egypt, too, fishers remained at the lowest rungs of the social hierarchy, below swineherders and tradesmen (Herodotus, *The Histories*, II. 164). Certain priests and holy men also abstained from eating fish because Poseidon was the god of the sea, and protector of all that lived beneath the waves (Radcliffe, 1926). The social and religious stigma surrounding the consumption of fish in Homeric times, however, was transient, eventually being overwhelmed by a radical shift in human attitudes.

That fishing became an intensive and flourishing activity in the ancient world is reflected in popular art, where fish and fishing were widely depicted on vases, plates, mosaics, and frescoes. Such illustrations, often remarkable for their accuracy as well as their artistic skill, indicate that the ancients possessed a detailed knowledge of the sea's varied fish species even in Mycenaean Greece, over a thousand years before Christ. To Aristotle and his successors, ichthyology was already a science and, in cataloguing fish and other marine life, these early naturalists relied as heavily on accumulated knowledge as they did on direct observation (Rostovtzeff, 1941).

Such was the demand for fish that the Eastern Mediterranean's richest fisheries had already been discovered by the Hellenistic age (320–30 B.C.). The development of boats that could venture more safely beyond the shelter of coastlines did much to spur on this burgeoning industry (Grant & Kitzinger, 1988). Fishing grounds from the coastal Aegean and the Black Sea, to Syrian and Phoenician shores were already being exploited during this period. Boats were soon also plying the distant Red Sea in search of richer catches (Rostovtzeff, 1941), and the geographer Strabo (*c.* 63 B.C. – A.D. 21) records that Greek colonies expanded their fishing industry to exploit the fisheries of the western Mediterranean. Fish curing industries also sprouted along the Mediterranean and Black Sea coasts, where saltworks were established to preserve catches for export to Greek markets (Grant & Kitzinger, 1988).

Oppian's discourse on fishing, *Halieutica*, written during the 2nd century A.D., provides an impressive catalogue of methods and equipment, some of which bear a striking similarity to those employed by today's traditional fishers in the Mediterranean. These devices, he tells us, brought "bitter destruction for so many fishes" (*Halieutica*, IV, 635-637).

"Some delight in hooks," he begins, "and of these some fish with a well-twisted line of horse-hair fastened to long reeds, others simply cast a flaxen cord attached to their hands, another rejoices in leaden lines or in lines with many hooks. Others prefer to array nets; and of these there are those called casting-nets, and those called draw-nets – drag-nets and round bag-nets and seines. Others they call cover-nets, and with the seines, there are those called ground-nets and ball-nets and the crooked trawl: innumerable are the various sorts of crafty-bosomed nets" (ibid., III, 72-85).

Additional refinements included the use of pine torches to lure fish towards the boats at night, a method reminiscent of the carbide lights found, until relatively recently, on fishing boats in the Adriatic, and also of the commercially-intensive *gri-gri* fishing vessels of the Eastern Mediterranean that utilise gas-powered lights. Similarly, the leaded lines "with many hooks" have been identified as the forerunners of today's well-established long line fishing for Aegean sea-breams, and elsewhere, for tuna, rays, and congers (Mair, 1963). The 'bag-net' may be related to today's purse seine, and the drag-nets an early form of trawling. A casting net is usually understood to be a net cast by a single person and immediately snatched from the water with its catch (Mair, 1963). Though rarely seen in the Mediterranean today, casting nets of a similar type can be found in some parts of Turkey, mostly in fishing river estuaries (Harun Güçlüsoy *pers. comm.,* 1998), and they are still in use by poorer inhabitants of the coasts of the Indian Ocean.

Perhaps most remarkable in Oppian's treatise is a fishing method which, although illegal today, continues to cause destruction to Mediterranean ecosystems. "There is another manner of fishing practised by fishermen who use poison," he writes, "who devise baleful poison for fishes and bring to the finny race swift doom." So abhorrent is this practice to Oppian that he likens it to the tactics employed in war, when entire cities perished due to the deliberate contamination of well-water (*Halieutica*, III, 685-693).

Though other toxic agents were also employed, Oppian reserves his righteous indignation for the use of the cyclamen root. Having driven shoals of fish into a bay or similarly enclosed area, he relates, the fishers would knead cakes of white clay and cyclamen, and toss them into the water. Dissolving there, "the evil-smelling poison of the hateful unguent… poisons the sea..." Rapidly, it reaches the fish in their hiding places, forcing them to dart away in fear for their lives. Then, "drunk with the deadly fumes, they wheel every way but nowhere find a place free from the plague, and they rush furiously upon the nets." And finally, laments Oppian, "the fishers draw forth an infinite crowd of dead, slain together by a common doom of destruction" (ibid., III, 647-684).

In his book *Fishing from Earliest Times*, published in 1926, William Radcliffe observed that Neapolitan fishers still used the same method, concocting a cyclamen-based paste which they then either cast into the water in lumps or, for more precise targeting, stuffed into bags secured to long poles. Here and elsewhere, the root was used to target grey mullet and other demersal fish species. Intoxicated, the fish would simply float to

the surface and were thus easily caught (Radcliffe, 1926; Mair, 1963). The relatively laborious task of digging up and preparing cyclamen roots has since been surpassed by the use of other toxic agents, such as chlorine (Ronald & Yeroulanos, 1984; Karavellas, 1994; Zavras, 1994).

While fishing in early antiquity largely remained in the hands of individual fishers and their families – much as it does today in traditional Aegean fishing communities – some aspects of the developing industry were surprisingly well-organised (Rostovtzeff, 1941). On the Aegean island of Kos in the second century B.C. public and private watch-towers were constructed, allowing fishers to spot seasonal migrations of tuna. Although the Romans imported seafood produce from independent traders as far afield as Spain and the Black Sea, in some parts of the Empire fishing may even have been a state-run monopoly (Speake, 1995).

Increasing sophistication in boats, equipment, and trading infrastructure spurred on the industry. While Hellenistic art largely conveyed a romantic view of subsistence coastal fishing, archaeological digs at Roman sites have unearthed various artifacts illustrating large-scale fishing with nets in the open seas (Grant & Kitzinger, 1988). The astrologer Manilius sheds further light on the intensity of fishing activities during the reigns of Augustus and Tiberius, noting that when "...a shoal of the scaly creatures has come to a stop and cannot move for the numbers, they are surrounded and drawn from the water by a huge drag-net, and fill large tanks and wine vats..." (*Astronomica*, 5, 680-684).

The burgeoning demand for fish in Greece and Rome created lucrative careers for traders and exporters, with several amassing large fortunes (Radcliffe, 1926). In some cases, such entrepreneurs were also a force to be reckoned with politically, landing the franchises for entire towns and cities (Rostovtzeff, 1941). Guilds of fish traders, in both Athens and Rome, exercised potent lobbying power. In yet another striking similarity to today's fishing industry, the guilds not only used their power to gain special economic privileges and concessions, but also to defeat or evade regulations which the authorities sought to impose upon them. As a result, there were virtually no regulations governing sea fishing, or hunting. Under Roman jurisprudence, every kind of animal, whether of the earth, air or sea, was literally a wild beast, instantly becoming the property of the individual who first "reduces them into possession" (Radcliffe, 1926). Apart from small coves neighbouring private land, fenced off with nets or stakes for the purposes of fishing, the sea could not be privately owned. Like the flourishing trade in wild animals for the Roman circus, it appears that fishing too became a free-for-all as the industry's cycle of supply and demand went spinning out of control.

In the cities of both Greece and Rome, fish of the finest quality gradually assumed luxury status (Radcliffe, 1926), the exorbitant prices they commanded in the marketplace reflecting not only the actions of profiteers and speculators, but possibly also the effects of over-exploitation. Seas and rivers were scoured far and wide to meet escalating demand (Radcliffe, 1926). While improvements in roads and shipping led to booming trade routes throughout the Roman Empire, and even beyond to India and the Orient, the rich fisheries of the Black Sea and the western and eastern reaches of the Mediterranean were still days or weeks away by ship (Scarre, 1995). Apart from thriving local demand, such

outposts were geared towards the preservation and processing of fish for export. *Garum*, for example, a much-prized fish sauce that the Romans used to garnish many a dish, was processed and exported from factories along Spain's southern coast (Scarre, 1995). For its fresh seafood, Rome had to rely on the Ligurian and Adriatic Seas, and it was here that the spectre of over-exploitation may have first become apparent.

As William Radcliffe (1926) observed, "No price was thought too extravagant for a mullet, a sturgeon, or a turbot; three mullets of historical celebrity even fetched in Rome the almost incredible sum of £240!" This infamous episode occurred during the reign of Tiberius (A.D. 14-37), and the historian Suetonius relates that the emperor "protested violently against an absurd rise in the cost of... high quality fish – three mullets had been offered for sale at 100 gold pieces each!" (*The Twelve Caesars*, III, 34).

The banquets of Imperial Rome were matched, if not exceeded, by the Greeks. From the menus documented by Athenaeus – albeit in parody – an Attic feast might feature not only meat and poultry of staggering diversity, but also over 30 species of fish (*Deipnosophistae*, IV, 13).

In Rome, gluttony went hand in hand with the Empire's debilitating decadence and corruption. Emperor Vitellius (69 A.D.) who, according to Suetonius, was chiefly addicted to the vices of luxury and cruelty, only managed to survive his drunken revelry and the mountains of food at banquets by training himself in the art of frequent vomiting (*The Twelve Caesars*, IX, 13). Such bizarre behaviour may be partly explained by perusing the bill of fare at one of the most notorious feasts given in his honour. It is said to have featured "2,000 magnificent fish and 7,000 game birds" (ibid., IX, 13).

In *Natural History*, Pliny the Elder complains that one mullet equalled the price of nine bulls (IX, 31). Small fish may have been cheap and plentiful (ibid., IX, 30), but they were also looked upon with disdain – arguably another compelling reflection of the decadence that was eating Rome alive. The Roman poet Martial, in *Epigrams*, confirms Pliny's observations: "Do not dishonour your gold serving-dish by a small mullet: none less than two pounds [908 grams] is worthy of it" (*Epigrams*, XIV, 97). As Juvenal scathingly remarks in his *Satires* (IV, 23):

> "Did *you* pay so much for a fish, Crispinus, you who once
> Went around in a loin-cloth of your native papyrus[38]? Why,
> You could have bought the fisherman for less than the fish."

A later writer, Macrobius, observes that in his time – the fifth century A.D. – such exorbitant prices had disappeared (Radcliffe, 1926) yet intriguingly, this also coincided with the final disintegration of the Empire, and with a tumultuous period when demand for fish, and supply through the export trade, almost certainly plummeted because of collapsing infrastructure.[39]

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[38] *i.e.* Egypt.

[39] After 395 A.D. the empire was split into the Byzantine Empire and the Western Roman Empire, which rapidly sank into anarchy under the onslaught of barbarian invaders from the North and East. The last emperor of the West, Romulus Augustulus, was deposed by Goths in 476, the traditional date for the end of the empire (*The American Heritage Dictionary of the English Language, Third Edition, 1992)*.

The profligate banqueting etiquette of the nobility, together with the activities of speculators that incited the wrath of many an emperor, may have been partly to blame for the skyrocketing fish prices that plagued Rome. Yet the conventional market equation of demand outstripping supply is likely to have been an equally important factor. If so, this provides some circumstantial evidence that the results of unbridled excess were also becoming apparent in the coastal fishing grounds that Rome depended upon to meet its needs. In much the same way that overfishing in the Aegean islands of the Northern Sporades in the 1980s resulted in imported beef from Argentina being considerably cheaper than locally-caught fish (Johnson, 1988), fish prices in Rome may well have fluctuated in direct correlation with degrees of scarcity and abundance.

While Roman overfishing would pale in comparison to today's scouring of the Mediterranean by industrial pelagic trawlers, its intensive coastal and open sea seining appears to have increased competition between fishers and seals. This, in itself, may also indicate a depletion of fishing grounds. Modern studies suggest a link between the intensity of competition among fishers, the severity of overfishing, and the level of fishers' hostility towards the monk seal (*e.g.* Karavellas, 1994).

Further details are provided by Oppian, expressing his awe at the seals in the circus ring as they fought and vanquished the bears pitted against them. For all their formidable might, the poet concedes, they will meet their match when confronted by a more deadly predator. Even for the "dread-eyed Seal" and the other "monsters of the sea," he writes, "the dauntless race of men has devised grievous woe, and they perish at the hands of fishermen... " (*Halieutica*, V. 41-43).

Oppian goes on to describe the killing of monk seals, and provides a clear indication that conflict between fishers and seals was common even in the second century A.D. Yet it is the additional detail colouring Oppian's brief account that makes this an important fragment of evidence. Despite its age, the description bears an uncanny resemblance to today's stormy relationship between fishers and monk seals. Oppian observes that the "raging seal" not only attacks and destroys fishing nets but – in another striking similarity to the present – that the animals may accidentally become entrapped within them.

The implication that the seals raided the nets in order to feed is particularly intriguing. While nets bulging with fish may offer seals an irresistible opportunity for an easy meal, such behaviour may sometimes also be driven by a different form of compulsion. Where overfishing has depleted their feeding grounds, seals may resort to raiding the nets simply in order to avoid hunger, and even starvation. With science handicapped by a dearth of knowledge on the biology and behaviour of the species, it is possible that this particular puzzle will never be satisfactorily explained, especially as coastal overfishing during Oppian's time may have been as severe in some areas as it is today. What is beyond dispute, however, is that Mediterranean fishers of the Roman period killed seals as net-damaging, fish-stealing pests, the animals being destroyed with "trident and mighty clubs and stout spears" (Oppian, *Halieutica*, V. 376-391).

Pinnipeds from other regions

Other seal species were also known to the ancient world, though there is scant evidence to suggest that they were as intensively exploited as the monk seal. The Greek historian Herodotus (*c.* 484–425 B.C.) makes a passing reference to the Caspian seal, *Pusa caspica* (Gmelin, 1788). The Araxes[40] river delta, he tells us, "has forty mouths, all but one issuing into swamp and marshland, where men are said to live who eat raw fish and dress in seal-skins; by the remaining mouth it flows clear into the Caspian Sea" (*The Histories*, I.202).

The Greek geographer Strabo (*c.* 63 B.C.–A.D. 24) also speaks of *Pusa caspica* in the Araxes delta, observing that "Those who live in the marshes eat fish, and clothe themselves in the skins of the seals that run up thither from the sea" (*Geography*, 11.8.6-7).

Other seal species also lived within the Roman sphere of influence. Writing in A.D. 98, the Roman historian Tacitus observes that the distant tribes of Germania "select animals with care, and after stripping off the hides decorate them with patches of the skin of creatures that live in the unknown seas of the outer ocean" (*Germania*, 17). By the second century A.D., greater control of the northern provinces of Gaul, Germania and Britannia allowed access to the North Sea, and yet there is no evidence to indicate that grey seals or harbour seals played an important role in the Roman economy.

Ancient references to pinniped species inhabiting the Red Sea, Persian Gulf and the Indian Ocean are far more difficult to interpret. While such fragments appeared to suggest the existence of a lost seal species in the region, further evidence was to prove elusive to later scholars of natural history. Largely because of possible confusion between seals and dugongs, the issue continues to fuel debate (Stoddart, 1972).

Basing his conclusions on an examination of ancient records, Keller (1887) reasoned that the Red Sea in antiquity must have "teemed" with seals, the hunting of which provided livelihoods for entire tribes.

Agatharchides, an Alexandrian geographer who lived in the 2nd century B.C., was a prominent figure in the Egyptian court of Ptolemy VI. Though most of his prolific output has been lost, his discourse *On the Red Sea* is quoted at length by the Greek historian Diodorus of Sicily (*c.* 80–20 B.C.), and also by Photius (*c.* A.D. 810–893), patriarch of Byzantium (Howatson, 1995; Speake, 1995).

In his *Library of History*, Diodorus turns his attention to the tribes known as the *Ichthyophagi* or 'fish-eaters'.[41] Though quite distinct from one another, this was the generic name applied to all of the primitive shore-dwelling peoples that were discovered in this region (Radcliffe, 1926). Diodorus describes them as inhabiting a broad swathe of coastline, extending from the shores of present-day Pakistan to the Egyptian Red Sea.[42] In his first detailed comments, he focuses on the hunting practices of fish-eating tribes living around the mouth of the Red Sea, "enclosed... by two continents, on the one side

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[40] Now known as the River Aras.

[41] King (1956) mistakenly identifies the *Ichthyophagi* as inhabiting the *west* coast of Africa, repeating a momentary lapse in Keller's *Thiere des classischen Alterthums* (1887).

[42] In contrast, maps and other reference material compiled from various ancient sources place the *Ichthyophagi* in two, more distinct, geographical areas – the shores of the Persian Gulf and the south-western Red Sea respectively (*e.g.* Oldfather, 1935).

by Arabia Felix [present-day Yemen] and on the other by the land of the Trogodytes [Ethiopia]" (*Library of History*, Book III, 15). Requiring neither boats nor nets, the tribes would simply wait for the flood tide, which would leave "a multitude" of fish trapped in numerous rock pools along the rugged coast. As the tide ebbed, men, women and children would set about gathering up the stranded fish, throwing them up onto dry land. Using sharp goathorns or jagged rocks as weapons, the tribe's strongest men would tackle fish and other sea creatures of greater size, including "seals" (ibid., 15.1 - 15.7).

Diodorus then turns his attention to cave-dwelling fish-eaters who lived along "the coast outside the gulf... banished by fortune from the inhabited regions into the desert."[43] The life of these people, "is far more astonishing," he asserts, apparently drawing on the reports of the numerous Egyptian merchants who sailed through the Red Sea to the Indian Ocean. According to Diodorus, Agatharchides based his descriptions of this tribe of "Ethiopians" on the reports of scouting expeditions ordered by King Ptolemy Euergetes I of Egypt, who wished to locate elephants, which he was passionately fond of hunting. This tribe, relates Diodorus, showed no fear for the brutalities perpetrated against them by foreign raiding parties, had no spoken language, obtained water only by way of the raw fish they consumed, and inhabited caves with seals, their society evolving into a symbiotic relationship with the species (ibid., 18.7).

Photius, in summarising the works of Agatharchides, adds some additional detail, observing that there was an "inviolate contract" between the fish-eating tribe and the seals. They live together in harmony, relates Photius, respect the fruits of each other's labour and make no attempt to even touch the fish caught by their neighbours. As such, "they live amongst each other in a way that people would scarcely be seen to live with [other] people" (*Bibliotheke*, *Agatharchides*, VII, 250, 450b, 12-19). The same legend is recorded by Aristophanes of Byzantium (*Aristophanis historiae animalium*, 2,43,3).

Otto Keller, who appears to have been a firm believer in the existence of the Red Sea and Indian Ocean monk seal, attributed this legendary cooperation to the species' renowned tameness and intelligence in antiquity (Keller, 1887; Pauly-Wissowa, 1894).

In a later passage, Diodorus describes a voyage along the eastern coast of the Red Sea, and provides an indication of the large numbers of seals that supposedly inhabited the area. The Island of Phocae, he relates, gained its name "from the animals which make their home there; for so great a multitude of these beasts spend their time in these regions as to astonish those who behold them" (*Library of History*, Book III, 42.1-5).[44]

The geographer Strabo (64 B.C.–A.D. 25), an Asiatic Greek who travelled extensively through Egypt and Ethiopia, also speaks of the cave-dwelling *Ichthyophagi* of the Red Sea but makes no specific mention of this tribe's curious relationship with seals (*Geography*, 16.4.13). He does, however, record the existence of Phocae or 'Seal Island' (ibid., 16.4.14). Possibly due to misinterpretation, or even the existence of a second island bearing the same name, Strabo – in contrast to Diodorus Siculus – places Phocae at the mouth of the Red Sea in an area populated by the *Ichthyophagi* (Mullero, 1855; *cf.* Oldfather, 1935).

As related earlier, the use of seal skins was reported in some versions of the Old Testament (although other translations identify the animals as 'sea-calves' or dugongs).[45]

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[43] Presumably the coast of South Yemen in the Gulf of Aden.

[44] See accompanying map in Loeb edition.

[45] e.g. *Exodus*, 25, 1-6; *Exodus*, 26, 14.

Since the Israelites had developed a lively trade with the Red Sea by this time, it was hypothesised that seal pelts may have been obtained not only from Israel's Mediterranean coasts, but also from the seal herds that allegedly populated the coasts of the Red Sea and its off-shore islands, including *Phocae* (Keller, 1887).

An eighteenth century edition of the *L'histoire naturelle*, authored by the distinguished French naturalist Georges-Louis Leclerc de Buffon, only serves to deepen the mystery over these ancient references to Red Sea and Indian Ocean seals. In a brief passage, Buffon records the existence of *le petit phoque*, noting that this seal species had been reported to him as inhabiting the Indian Ocean. Accompanying the text is an engraving of the alleged species, which bears a strong resemblance to a neonatal fur seal (Buffon, 1765). Indeed, in subsequent supplements to *L'histoire naturelle*, Buffon speculates that *le petit phoque* is an eared seal, and most probably a variation of a fur seal (Buffon, 1782).

Buffon's contemporary, the German naturalist Johann Schreber, also records *le petit phoque* (or *Phoca pusilla*), calling the species 'the small eared Seal'. In his 1778 encyclopaedia on marine mammals, he describes the animal's long, curly and soft black pelage, and its brownish-black belly. He also notes that the head bears distinct traces of vestigial ears. Citing Buffon, he records its habitat as the Levantine Sea (a former name for an area of the eastern Mediterranean now occupied by Lebanon, Syria, and Israel) and the Indian Ocean, and concludes (again paraphrasing Buffon) that the species must be the same as the "black-furred seal of antiquity" – the Mediterranean monk seal. Aristotle, Schreber observes, bequeathed precise and well-formulated descriptions of the species, and also remarked upon its vestigial ears. He goes on to speculate that the skins used to decorate and protect the Tabernacle originated from none other "than our Little Seal" (Schreber, 1778).

Yet in the seventh volume of Schreber's encyclopaedia, published in 1846 after the naturalist's death, the *Phoca pusilla* had disappeared. In its place, and no longer inhabiting the Indian Ocean, was the *Leptonix Monachus*, the Mediterranean monk seal (Schreber & Wagner, 1846).

Thomas Pennant, in his 1791 study *History of Quadrupeds*, also provides a description of the Little Seal, but casts doubt on its Indian Ocean origin. "Our seal hunters affirm," writes Pennant, "that they often observe, on the coast of Newfoundland, a small species, not exceeding two feet, or two feet and a half, in length. M. de Buffon says the specimen in the cabinet of the French king came from *India*; but from the authority of Dampier, and of modern voyagers to the *East Indies*, who have assured me that they never saw any Seals there, I suspect he was imposed upon." In a footnote, he adds: "A gentleman, the most curious, and greatest navigator of the Indian seas now living, informed me, that he not only never met with any Seals in those seas, but even none nearer than the isles of Galapagos, a little north of the line, on the coast of America" (Pennant, 1793).

With such uncertainty clouding its existence, the Indian Ocean seal may have been consigned to the realms of myth were it not for additional sightings. In August 1771, a British Admiralty ship charting the Seychelles archipelago sighted Eagle Island, and Lieutenants David Thomas and William Robinson set about mapping its coastline. "This Island has no fresh water," they noted in brief annotations to their chart. "It is covered with small low trees, and on it Sea-Lions and Sea-Birds are in great Plenty." The chart

names the south-western tip of the island as "Sea Monster Point," an indication, perhaps, of the pinnipeds that congregated there (Stoddart, 1972).

Sailing east, the survey ship anchored at Bird Island, the Lieutenants noting that "This Island has a prodigious Number of Birds on it, and many Seals and Turtle. It cannot be seen at Sea in clear Weather further than three Leagues and is very dangerous and has no Fresh Water" (Thomas & Robinson, 1780).

Reports and sightings of the phantom seal in the Red Sea also continued. In his book *Travels in Arabia*, the 19th century British writer, J.R. Wellsted, mistakenly identified Phocae (the 'Seal Island' cited by Diodorus and Strabo), by its modern name of Shadwân. Noting that the seal "known to the ancients" still frequented the northern reaches of the Red Sea, Wellsted related how he and his companions were shown the skins and "tusks" of the animals on several occasions while visiting local fishing communities. In all likelihood, this would indicate that the British explorers were being shown dugong, rather than seal, remains. Further south, Wellsted described the flat, sandy island of *Sejâl*, and noted that the same ill-identified species frequented the area in significant numbers. Fishers of the migrant Hutêmi tribe would capture the animals after they appeared to lose their way in the upper parts of the reef (Wellsted, 1842).

Disagreement regarding the precise location of the island of Phocae has further clouded the issue. While Wellsted identifies it as Shadwân, others suggest Tiran, lying at the mouth of the Gulf of Aqaba (Woelk, 1966). Charts compiled from ancient sources, however, point to the small island lying off Ras-Mohammed, at the southern tip of the Sinai Peninsula.[46] In contrast, modern charts indicate that Shadwân (marked on some maps as *Gazirat Sadwân*) lies almost due south of Sinai, the last in a cluster of islands off the Red Sea's western shore.

Budker (1939) insists that the seals reported from Shadwân (described as 'Seal Island' in several nautical reference books cited in his paper) must be considered as dugongs. This conclusion is echoed by Woelk (1966). In his dissertation *Agatharchides von Knidos,* Woelk faithfully translates the animals as seals, but in his commentary, suggests that they should be identified as dugongs. He reasons that the inhabitants of Tor, north of the island of Tiran – which he identifies as Phocae – still catch dugongs to produce sandals from their skin. Quoting other sources, he notes that dugong bones were also discovered on islands off Egypt's Red Sea coast (Woelk, 1966).

However, the fact that foreign travellers to this remote region may once have confused dugongs with seals does not necessarily disprove the possibility that a now-extinct pinniped species once inhabited the Red Sea.

While the 'mistaken identity' theory may appear compelling, there are several important inconsistencies reflected in the ancient texts of Agatharchides. Dugongs are herbivorous marine mammals which graze on seabed grasses, and therefore do not catch or consume fish. Although Wellsted's description of the animals becoming "lost in the upper parts of the reef" may be rather more suggestive of dugongs than seals (Wellsted, 1842), the former do not inhabit caves, and neither do they rest or give birth on land. However, it is conceivable that dugongs frequented the waters around the island of Phocae and thus

[46] In *Diodorus of Sicily*, translated by C.H. Oldfather, Harvard University Press & William Heinemann Ltd. 1979, and *Geographi Graeci* by Carolo Mullero 1855.

inspired its erroneous name. Furthermore, when floating, monk seals do bear a resemblance to dugongs. Without exhaustive archaeological research, that might conceivably unearth the bones or teeth of these animals, it would be virtually impossible to draw any firm conclusions regarding the possible identity of the species in question.

As noted previously, Diodorus describes the *Ichthyophagi* tribes as inhabiting a large geographical area, from the mouth of the Red Sea to "Carmania and Gedrosia" – south-eastern Persia and Baluchistan. The study of linguistics appears to provide additional evidence that seals were once found in the region. The language of ancient Mesopotamia,[47] for example, has a word for seal – *kud-da* (Salonen, 1970), possibly suggesting that seals were once found in the Indian Ocean as far north as the Persian Gulf. It is, however, equally possible that the word reflected this people's knowledge, through exploration and trading, of the Mediterranean coast and its seals.

More recent publications have shed further light on the existence of seals in the Indian Ocean. King (1983), records historical sightings of the Southern Elephant Seal *Mirounga leonina* (Linnaeus, 1758) from St. Helena (lat. 16°S), from Rodriguez (lat. 19°48'S) – where two young animals were caught in 1942 and 1954 – and from Mauritius in 1955. In the 18th and 19th centuries, seals were sighted on beaches in the Seychelles and Amirantes, and appeared to have been abundant enough to support oil-processing industries on the neighbouring island of Coetivy. King concludes that such records "do seem to suggest the presence of large seals in the northern Indian Ocean."

In 1990, the curator of the Zoological Museum of Amsterdam, P.J.H. van Bree, discovered the skull of a juvenile Southern Elephant Seal in the Natural History Museum in Muscat, Oman, and learned that the animal had originated locally. Further enquiries at the National Fishery Laboratory, south of Muscat, suggested that seals continued to be observed from time to time along the Indian Ocean coast of Yemen (P.J.H. van Bree *pers. comm.,* 1998). In further evidence, Johnson (1990) notes that a young female southern elephant seal was shot by fishers in 1989 on the coast of Oman (central North Arabian Sea) because it was "considered a potential threat to children." Johnson (1990) also recorded the personal sighting of an undetermined phocid species in the Gulf of Oman (near the Muscat area) in 1988, and two additional reliable observations, in 1989 and 1990 respectively.

It has been suggested (P.J.H. van Bree pers. comm., 1998) that a population of Southern Elephant seals might once have existed at the mouth of the Red Sea, in an area of cold water upwellings. According to this theory, although the colony may have been exterminated long ago, individual elephant seals continue to venture north, thus generating intermittent sightings of the animals.

In a comprehensive review of historical records, Stoddart (1972) concludes that on present available evidence, it would be impossible to positively identify the seals recorded from the Indian Ocean unless osteological remains were to be discovered and analysed.

While duly noting the historical appearance of the Southern Elephant Seal in relatively northern latitudes, Stoddart also raises "the possibility that the seal was a now extinct Indian Ocean equivalent of the Caribbean and Pacific Monk seals."

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[47] An ancient region of Southwest Asia between the Tigris and Euphrates rivers in modern-day Iraq.

CONCLUDING REMARKS

Conservation efforts aimed at protecting the endangered Mediterranean monk seal frequently bemoan the general lack of biological information about the species. They are also predicated, at least implicitly, on the view that the depletion of the species and its dramatic range contraction are 20th century phenomena.

Our review of the monk seal in ancient history and literature generally endorses the conclusion that – with the possible exception of the past ten years – rather little has been learned about the species since the time of Aristotle (Harwood, 1987). But it also appears to refute the conclusion that the current status of Mediterranean monk seals arises almost exclusively from recent problems. Indeed, there seems to be abundant evidence that the species arrived at its current precarious position after centuries of intensive exploitation – particularly during the Roman period. This exploitation took many forms, including live capture, killing for commerce, entertainment, and medicine, and culling, ostensibly to reduce interactions between seals and fisheries. Loss of habitat due to human encroachment is also nothing new to the Mediterranean monk seal, even if this particular threat has reached unrivalled intensity during the 20th century.

Indeed, the threats to modern pinnipeds (including the Mediterranean monk seal) – large-scale overfishing, direct killing by fishers because of net damage and perceived competition for dwindling fish stocks, deterioration of habitat due to human disturbance (particularly development and mass tourism), commercial exploitation, the trade in seal parts for medicines and quack remedies arising out of ancient myths and superstitions – are precisely the same factors that contributed historically to the decline of *M. monachus* and other seal species and populations.

It is also clear from our review that the ancient human attitudes that led to the decline of Mediterranean monk seals remain firmly entrenched within modern society (Lavigne et al., 1999). Since humans first encountered seals in coastal regions of the world they have been viewed from a utilitarian perspective, first for personal subsistence use and, inevitably, eventually for commerce. Their parts and derivatives have long been held to possess a wide range of medicinal properties, and the animals have been killed for such purposes. They have also been captured and held in captivity to entertain the masses. Such practices not only continue today in many parts of the world but, after a brief respite arising out of the environmental movement of the 1960s, they are once again being promoted with renewed vigour by those who naïvely or self-servingly advocate such commercial exploitation as the means to conserve wildlife at the end of the 20th century (Lavigne et al., 1996; Lavigne et al., 1999).

While seals occasionally have been associated with charming and harmless myths that feature them in a benevolent light, more often than not they have been demonised as smelly, obnoxious animals that compete (somehow unfairly) with humans for fishery resources in the sea. In addition to the examples provided above from antiquity, it should be remembered that even Linnaeus, the father of modern taxonomy, characterised seals in the eighteenth century as "a dirty… quarrelsome tribe." And the depth of disdain that seals have long engendered in some people was nowhere more evident than in a recent comment by Newfoundland's (Canada) fisheries minister, the Hon. John Efford, in his

province's House of Assembly. Commenting on harp seals and their perceived impacts on depleted fish stocks, Mr Efford said, "…I would like to see the 6 million seals, or whatever number is out there, killed and sold, or destroyed or burned. I do not care what happens to them… the more they kill the better I will love it" (Efford, 1998).

All of which raises important questions. If humans have been unable to learn from 2,500 years of recorded history, and provide adequate legal protection for Mediterranean monk seals to halt their decline and promote their recovery, what are the chances that we will suddenly experience an epiphany, alter our attitudes, and implement the necessary conservation measures before it is too late? Can there be any hope that society will acknowledge the threats posed to seals and other wildlife – by commercial exploitation and trade (Johnson, 1990; Lavigne et al., 1996), unregulated culling activities, and habitat destruction – in time to prevent currently abundant populations from suffering a similar fate? The survival of the Mediterranean monk seal, the Hawaiian monk seal *Monachus schauinslandi* Matschie, 1905, (Lavigne, 1999) and other threatened and endangered pinnipeds (Reijnders et al., 1993) may well depend upon society's response to such questions.

Appendix

ANCIENT TEXTS

This appendix summarizes the results of our search of the literature from the Greek, Roman and Byzantine periods (see Bibliography). The relevant texts are presented below, in alphabetical order by author. To facilitate further study and analysis, we have quoted the relevant extracts at length. For the most part these texts are self-explanatory, but where considered necessary, additional lines of clarification are provided. To assist in putting each reference into historical context, we also provide brief biographical sketches with the excerpts of each author.

Aelian (*c.* A.D. 170 – *c.* 235)

Aelian (Claudius Aelianus) was a Roman sophist born around A.D. 170 at Praeneste in Italy. He gave up a teaching career in Rome to dedicate himself to writing. His 17-book work *On the Characteristics of Animals* was chiefly written for entertainment, liberally blending fact with anecdotal stories, legend and gossip.

"The Seal, I am told, vomits up the curdled milk from its stomach so that epileptics may not be cured thereby. Upon my word the Seal is indeed a malignant creature" (*On the Characteristics of Animals*, III. 19).

"Eudemus asserts that a Seal fell in love with a man whose habit was to dive for sponges, and that it would emerge from the sea and consort with him where there was a rocky cavern. Now this man was the ugliest of his fellows, but in the eyes of the Seal the handsomest. Perhaps there is nothing to wonder at, for even human beings have frequently loved the less beautiful of their kind, being quite unaffected by the best-looking and paying no attention to them" (ibid., IV. 56).

"Seals give birth on land, but by degrees lead their cubs down to the water and give them a taste of the sea. Then they lead them back to the original place of their birth, and again bring them down to the sea, and quickly lead them out, and by doing this many times they end by making them excellent swimmers. And they easily slide into life in the sea: their instruction affords an inducement, while Nature forces them to love the haunts and habits of their mothers" (ibid., IX. 9).

"Sea-calves are marine animals, and on headlands and projecting rocks they utter a kind of ominous cry and a very deep roar. And moreover whoever hears this sound, for him there is no escape, but he dies soon after... Seals emerge for choice [from the sea] when it is dark, although they do in fact sleep on shore at midday. Homer knew this and in the Odyssey he has represented Menelaus explaining to Telemachus and Pisistratus this habit they have of resting, when he was telling them of what happened at Pharos and of the sea-god Proteus and of the prophecy which was uttered by the aforesaid Proteus" (ibid., IX. 50).

"Fishes that have no scales are called 'cartilaginous': for example, the moray, the conger-eel, the torpedo, the sting-ray, the horned-ray, the dog-fish; <'cetaceans'>, the dolphin, the whale, the seal; these are the only aquatic creatures that are viviparous" (ibid., XI. 37).

Aelius Herodianus (2nd century A.D.)

A Greek grammarian, Aelius Herodianus was born and raised in Alexandria. While in Rome, he attracted the interest of Marcus Aurelius and later dedicated his major work, on prosody, to the emperor. Although little of Herodianus' work is considered original, he became an authority for later grammarians.

"[In Herodotos] 'Phokaie' is spelled also with an 'e' [in the Ionic dialect]. And it was called this on account of the fact that many seals followed after the founders. There is also another city [of the same name] in 'Mycale' of Karia" (*De prosodia catholica*, 3,1,273,1).

"There is also an island [formed adjectivally] in 'Istros', *nike*, *phrike*, *beke*, *theke*, *phoke*; *phoke* is also an Ionian city, Phokaia" (ibid., 3,1,313,13).

"Feminine nouns pronounced with a circumflex above one syllable as a result of contraction have the circumflex accent such as *argurea argurâ, Athenâ* and *mnâ,* and *chalkea* and *chalkê, phokea phokê*" (*Peri Pathon*, 3,2,319,31).

Aetius Amidenus Med (6th century A.D.)

Born in *Amida* in Mesopotamia, Aetius studied medicine in Alexandria, and went on to become a physician at the Byzantine court. Here, he compiled his 16-volume compendium of medical knowledge, drawing chiefly upon the works of Galen, but also of many other, lesser known, physicians. True to the trend of the times, *Iatricorum* places great emphasis on pharmacy which, both in pagan and in Christian circles, possessed a mystical dimension.

In Book VI of *Iatricorum* Aetius recommends a treatment for patients who have been bitten by rabid dogs, and are suffering from hydrophobia (Tina Marshall *pers. comm*., 1996).

"And spread under them usefully and thrown onto them is the skin of the bear and of the seal, and especially of the hyena for it is most clear, that the skin, when it has been thrown over them, effects a swift return of the judgement, and the skin of the hyena, when it has been burnt and when the ashes are given in the drink stops the hydrophobic suffering" (*Iatricorum*, liber vi, 24.121).

Agatharchides (2nd century B.C.)

See *Aristophanes of Byzantium, Diodorus Siculus* and *Photius*.

Alexander Trallianus (*c.* A.D. 525-*c.* 605)

A Byzantine physician who practised and taught in Rome, Alexander of Tralles gained recognition for his treatise on pathology and therapy. Used as a basis for instruction long after his death, *Therapeutica* was translated into Arabic and Latin and was printed in Greco-Latin editions throughout the 16th century. Prior to becoming a teacher of medicine in Rome, he travelled through Italy, Africa, Gaul and Spain, probably as a military physician. Although regarded as an eclectic with a practical focus, prevailing superstitions also found a place in his therapies.

Recommending 'an often praised and very proven panacea against podagra' (gout of the foot and big toe), he states:

"Taking the sinews of a wild donkey, a boar, and a stork, knot intestines onto the end and tie the right sinews onto the right foot of the patient, and the left ones onto the left; and straightway you will have a patient free from pain. After the pain has ceased, you shall no longer attach these [*i.e.* sinews], but [you shall do so] whenever the feeling of pain returns... Some do not plait the sinews of the stork together with the others, but keep them aside and put them into a seal skin, and bind it with the intestines that have not been knotted to the stork sinews, and they attach these in the same way onto the feet of the patient, [that is], the right sinews onto the right foot and the left onto the left, when the moon is waning or upon its entry into the barren constellation and that of Saturn" (*Therapeutica*, 2, 579).

Later, he notes that there is also a prophylactic remedy against the gout of feet and hands:

"...Of even better service is the skin of a seal, which one lays under the soles..." (ibid., 2, 581).

Andromachos the Younger (1st century A.D.)

See *Galen*.

Anonymi Medici

The *Anonymi Medici*, a collection of fragments of anonymous medical writers, were found in a manuscript codex in the 19th century and subsequently published, edited and commented upon by R. Fuchs, the scholar who discovered them. Dating from late antiquity, the fragments relate material from earlier medical authorities, including Hippocrates, Praxagoras and Democritus, sometimes identifying them simply as 'the ancients'. Commenting on the following fragment, Fuchs (1895) notes that it appears to be a revision of a pseudo-Aristotelian theory on thunderstorms, and that it corresponds closely to an epitome authored by Theophanes Nonnus (Theophanes Nonnus, *de curatione morborum*, cap. CCLX ed. Bernard II 286-289).

"So then, the things which guard one from thunderbolts are these: from the earth, the laurel and the fig tree. Among the birds, the eagle. Among the swimming creatures, the seal" (*Fragmenta varia, 2, 9*).

Antigonus (3rd century B.C.)

A writer and a caster of bronze, Antigonus hailed from Karystos on the Greek island of Euboea. In his youth, Antigonus lived in Athens, yet travelled frequently through Greece. Later, he became active as a statue-maker and as writer at the court of Pergamon under Attalus I (241-197 B.C.). His writings include biographies of philosophers, art historical works, and a 'collection of wonderful phenomena', from which the following extracts are taken.

"For that is a remedy for epilepsy, as Aristotle writes. 2. Similarly, the seal is said to vomit serum; for this too is effective against the same sickness" (*Historiarum mirabilium collectio*, 20,2,1).

"1. Of the birds, the bat alone has teeth and breasts and milk. 2. And Aristotle says that both the seal and the whale have milk" (ibid., 22,2,1).

Apollodorus (*c.* 180–*c.*110 B.C.)

Apollodorus of Athens was a Greek scholar who flourished around 140 B.C. After studying in Alexandria, he travelled to Pergamum and, later in life, is thought to have returned to his native Athens. Only fragments of his works survive. *Bibliotheke*, a study of Greek heroic mythology that is attributed to him, is thought to have been compiled by others in the first or second century A.D.

"Afterwards Aeacus cohabited with Psamathe, daughter of Nereus, who turned herself into a seal to avoid his embraces, and he begot a son Phocus" (Apollodorus, *The Library*, III. xii. 6).

Aristophanes (*c.* 445–*c.* 385 B.C.)

Aristophanes of Athens is considered the most celebrated writer of Greek comedy. Appealing to the conservative tastes of his audience, the favourite targets of his satire included politicians and bureaucrats, fellow dramatists, philosophers, and scientists. Of some 40 plays he is known to have written, only 11 survive. "Our poet," declaims the chorus-leader in *Wasps* and *Peace*...

"...did not attack mere men, but with the spirit like that of Heracles he tackled the greatest monsters, boldly facing up right from the start to the Jag-toothed One himself, from whose eyes shone terrible rays like those of the Bitch-star, while all around his head licked serpentlike a hundred head of accursed flatterers; he had the voice of a torrent in destructive spate, the smell of a seal, the unwashed balls of a Lamia, and the arse of a camel..." (Aristophanes, *Wasps*, 1030-1036).[1]

Aristophanes of Byzantium (*c.* 257–*c.* 180 B.C.)

Aristophanes, who was to gain recognition as a grammarian, was born in Byzantium around 257 B.C. After travelling to Alexandria in his early youth, he became the pupil of distinguished teachers, most notably Callimachus, Zenodotus and Eratosthenes. In his sixty-second year (*c.* 195 B.C.), he became head of the Alexandrian library. Alongside one of his own students, Aristarchus, Aristophanes became known as the greatest grammarian and literary critic in antiquity, highly regarded for his wide-ranging knowledge. His zoological epitome (*Aristophanis historiae animalium*) is a compilation of material, chiefly drawn from Aristotle.

"…the sea-eel, the conger-eel, the electric eel, the sting-ray, the Notidanus griseus, the dog-fish/small shark and those greater than these are said to be cetaceous, just as the dolphin, the whale and the seal. It happens to these alone of those who live in the water that they are viviparous" (*Aristophanis historiae animalium*, 1,2,3).

"All animals which have hair are viviparous, except for certain sea creatures such as dolphins, seals, and members of the shark family; for these, although they do not have hair, nevertheless are viviparous" (ibid., 1,124,2).

Aristophanes' *historiae animalium* survives only in epitome form, in a 'text book' edition featuring several authors, compiled by the Byzantine emperor Constantine Porphyrogenitus VII (912-959 A.D.). The following extract is based on the work of the 2nd century B.C. Alexandrian geographer Agatharchides of Cnidos, *On the Red Sea*. While this work has not survived, extensive quotations from it have been preserved in the *Library of History* by Diodorus Siculus and the *Bibliotheca* of the Byzantine scholar Photius (Tina Marshall *pers. comm.,* 1996).

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[1] See also *Peace*, 754-758.

"He says that those dwelling near the thirstless and fish-eating ones [*i.e.* the *Ichthyophagi*], just as if an untransgressible treaty had been settled between them and the seals, neither themselves plunder the seals nor are these hurt by them. But each race protects their hunts without plotting against one another" (ibid., 2,43,3).

Aristotle and Corpus Aristotelicum

The *Corpus Aristotelicum* is composed of various passages from lost works of Aristotle, quoted or summarised by later writers, as well as several, relatively minor, studies attributed to pupils of Aristotle and earlier members of the Peripatetic school. These additional compositions, usually focusing on narrower subjects not addressed by Aristotle himself, were eventually incorporated into the *Corpus Aristotelicum*, thus lending the philosopher's work an encyclopaedic character.

Database searches for relevant keywords yielded four reference results among the *Fragmenta varia* of the *Corpus Aristotelicum*. These were found to be identical to Aristotelian fragments preserved through citation or paraphrase by later authors:

Corpus Aristotelicum		Refer To:-
Ref. 7,39,280,11	⇨	Aristophanes, Historiae animalium, 1,2,3
Ref. 7,39,281,4	⇨	Aristophanes, Historiae animalium, 1,2,3
Ref. 7,39,292,12	⇨	Antigonus, Historiarum mirabilium collectio 22,2,1
Ref. 7,41,370,5	⇨	Antigonus, Historiarum mirabilium collectio 20,2,1

Table 2: References located in the Fragmenta Varia of the Corpus Aristotelicum were found to be identical to fragments attributed to Aristophanes of Byzantium and Antigonus respectively.

Aristotle (384–322 B.C.)

Aristotle was born in Stageira in Chalcidice. His prolific works encompassed every branch of philosophy and science known in his day, ranging from ethics and metaphysics to zoology, botany, anatomy, and meteorology. Some 400 works are attributed to him, of which only about a fifth survive. At the age of eighteen he entered Plato's Academy, and remained at the philosophical school for twenty years until Plato's death in 347 B.C. In 343/2, King Philip of Macedon summoned the philosopher to take over the education of his son, Alexander. Aristotle opened his own school – the Lyceum – in 335 B.C., which had the character of a research centre. Upon the death of Alexander the Great in 323 B.C., the endangered Aristotle fled to Chalkis in Euboia, where he died at the age of 62.

Many of Aristotle's zoological investigations were carried out in collaboration with Theophrastus on the island of Lesbos, where he strove to provide, through observation and dissection, the first logical classification of the animal world. As such, Aristotle is often credited with founding zoology as a science, and is recognised for his efforts to classify species according to their physical appearance, nature, and attributes. Aristotle's descriptions of the seal's anatomy are, to this very day, regarded as generally accurate (King, 1956). Keller's generalisation (1887), that scientific zoology in antiquity classified the seal as a *selachian* is therefore misleading. Indeed, Aristotle, considered the only true representative of scientific zoology in ancient times, identified the seal as 'viviparous', a term considered the precursor of the classification 'mammal'. While Aristotle's contribution towards advancing a utilitarian and materialistic view of nature has been the subject of some discussion (*e.g.* Hughes, 1988) there can be little doubt regarding his stature and impact in the field of natural history. For the following eighteen centuries naturalists that followed in his footsteps scarcely accomplished more than copying and translating his works or commenting upon them (Mair, 1963). While several later authors appear to have grouped the seal together with the *Selachii*, it has been suggested these can no more be regarded as representatives of scientific zoology than the early church fathers who also commented upon natural history in order to deliver moral and religious teachings (Pauly-Wissowa, 1894).

In addition to his expansive study of natural history, *Historia Animalium*, Aristotle also wrote smaller zoological treatises on anatomy, locomotion, and reproduction.

In the following extract, Aristotle attempts to find a suitable classification for species that are not exclusively terrestrial or aquatic (French, 1994):

"Similarly, seals and bats are in an intermediate position. Seals are between land-animals and water-animals, bats between land-animals and fliers: thus they belong to both classes or to neither. Seals, if regarded as water-animals, are anomalous in having feet; if regarded as land-animals, in having fins (their hind feet are altogether like those of fishes – *i.e.* fins; and all their teeth too are sharp and interlocking)" (*On the Parts of Animals*, 697b, 1-8).

Certain marine animals, he observes, though seemingly amphibious, cannot survive if deprived of either their terrestrial or aquatic environments. These animals must obtain their food in water…

"…some indeed to such a degree that they cannot even live separated from the nature of water, for instance the so-called sea tortoises and crocodiles and hippopotamuses and seals and some of the smaller animals such as the freshwater tortoises and the frog kind: for all of these suffocate unless they breathe at certain intervals. Also, they give birth and rear their young on dry land, or in some cases beside the land, but spend their time in the water" (Aristotle, *Historia Animalium*, 598a, 24-32).

"Certain of the animals that are quadruped and wild get their food at lakes and rivers, but none at the sea except the seal" (ibid., 594b, 28-30).

"Respiration is also employed by all animals which live and pass their time in the water, such as the genera watersnake, frog, crocodile, and freshwater tortoise; also sea and land tortoises, and seals. All these and similar animals bring forth their young on dry land, and either sleep on dry land, or in water with their mouth above the surface for breathing" (*On Respiration*, 475b, 26-30).

"The seal comes under the heading of 'animals that dualize': it does not take in seawater: it breathes and sleeps and brings forth its young on dry land (near the shore, though, it is true) as belonging to the land-animals; on the other hand, it spends most of its time in the sea and gets its food from the sea, and therefore we must discuss it along with the aquatic animals. It is intrinsically viviparous (there is no oviparous stage) and brings forth its young alive, and produces a chorion and all the rest, just like a ewe. It produces one, or two, young; at the most three. It has two teats[2] and gives suck to its young as quadrupeds do. Like human beings, it bears at every season of the year, but especially at the time when the first goats are kidding. When the young are about twelve days old, it takes them down to the sea many times a day to accustom them to it gradually. To get down steep places it just lets itself go without attempting to walk, because it is unable to get a grip with its feet. It can contract and compress its own bulk, because it is soft and fleshy and its bones are cartilaginous. It is difficult to kill a seal by using force, unless you strike it on the temple, because its body is fleshy. It lows like a cow. In respect of its genital organ also the female resembles a cow; in all other respects [i.e. in its sexual anatomy] it resembles the human female" (*Historia Animalium*, 566b, 27-33; 567a, 1-14).

"Of footed animals, some walk, some creep, some wriggle. No animal is merely able to fly (winged), as the fish is merely able to swim. Even the dermatous-winged animals can walk about, and bats have feet, and the seal has stunted feet" (ibid., 487b, 20-23).

"Must all this class [snails] be regarded as maimed and as moving in the same way as an animal with feet if one were to cut off its legs, or as analogous to the seal and bat, which are quadrupeds but malformed?" (*On the Progression of Animals*, 714b, 9-13).

Discussing breeding and reproduction, Aristotle notes that the seal gives birth to living offspring that develop within the uterus of the mother:

"Examples of viviparous animals are man, horse, seal, and all other hairy animals; of water-animals, the cetacea (*e.g.* the dolphin) and the Selachia [the cartilaginous fishes such as dogfishes, sharks and rays]" (*Historia Animalium*, 489a, 1-3).

"The seal copulates like the retromingent animals: seals remain together in coition for a long time, as dog and bitch also do. The male's penis is large" (ibid., 540a, 23-26).

Discussing seal anatomy, Aristotle observes:

"Nature has brought off a clever piece of work in the seal, too, which, although it is a viviparous quadruped, possesses no ears but passages merely. The reason is that it spends its life in a fluid medium. The ear is a part of the body which is an addition made to the passages in order to safeguard the movement of the air which comes from a distance, and therefore it is no use to the seal; indeed it would actually be a hindrance rather than a help, because it would act as a receptacle for a large volume of water" (*On the Generation of Animals*, 781b, 22-28).

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[2] Aristotle erred in this particular instance. The Mediterranean monk seal, like most other *monachine* seals, has four teats (King, 1983).

"One viviparous animal, the Seal, has no ears but only auditory passages; but this is because, though a quadruped, it is imperfectly developed" (Aristotle, *On the Parts of Animals*, 657a, 21-24).

"While some animals which have the power of hearing possess ears, others do not, though they have the passage, which can be plainly seen... All Vivipara have ears, except the seal, the dolphin, and other such Cetacea... The seal, sure enough, has passages, clearly visible, through which it hears; whereas the dolphin has the power of hearing but no ears." (*Historia Animalium*, 492a, 23-29).

"There is always a hollow (*lumen*), varying in size, in the kidneys, except in the seal, whose kidneys are more solid than any others and in shape resemble those of the ox" (Aristotle, *On the Parts of Animals*, 671b, 4-7).

"Passages lead to the kidneys both from the Great Blood-vessel and from the Aorta, though they do not lead into the cavity. I have not so far mentioned this cavity in the middle of the kidney. In some animals it is larger, in others smaller; but there is none in the seal's kidneys. These are similar to those of oxen, and are more solid than those of all other animals" (*Historia Animalium*, 497a, 4-8).

"There is no gall-bladder in the seal, nor (among sea-animals) in the dolphin" (*On the Parts of Animals*, 676b, 28-29).

"Some animals have, and some have not, a gall-bladder up against the liver. The deer is an example of a viviparous quadruped which has none: other examples are the roe, the horse, the mule, the ass, the seal, and some kinds of pig" (*Historia Animalium*, 506a, 21-25).

"Among oviparous quadrupeds, lizards (and serpents too) have a two-forked tongue, the tips of which are as fine as hairs. Seals also have a forked tongue. This forked tongue explains why all these animals are so dainty in their food" (*On the Parts of Animals*, 691a, 5-10).

"Compared with the tongues of other animals, those of serpents and lizards have the peculiarity of being forked at the tip; and this feature is specially marked in the serpents, the tips of whose tongues are as fine as hairs. The seal, too, has a divided tongue" (*Historia Animalium*, 508a, 22-27).

"The seal is a sort of stunted quadruped. Immediately behind its shoulder-blades are its front feet, similar to hands, like those of the bear, for each has five toes, and each toe has three flexions and a smallish nail. The hind feet also have five toes, and flexions and nails similar to those of the front feet, but in shape they are comparable to the tail of a fish" (ibid., 498a, 31-37).

"Whatever parts man has in the forefront of the body, the animals have on the underpart, *i.e.* on the belly; and man's rear parts they have on the dorsal sides. Most of them have a tail: even the seal has a small one, similar to that of the deer" (ibid., 498b, 11-16).

"In most animals the front teeth are sharp and the inner ones broad and flat. The seal is completely saw-toothed, being a sort of link with the class of fishes, nearly all of which are saw-toothed" (ibid., 501a, 21-24).

Discussing behaviour of seals, Aristotle states:

"Now there is a war against each other among all animals that occupy the same places and get their living from the same things. For if their food is scarce, even those of the same breed fight against each other, for they say that even the seals living around the same place make war, male against male and female against female, until one kills the other or is driven away; and the pups all do the same" (ibid., 608b, 18-26).

In a brief reference to the utilisation of seals for medical purposes, Aristotle writes:

"They say that the seal vomits beestings [the first milk secreted by a cow or similar animal immediately after giving birth] when caught; this has curative properties, and is good for epileptics" (*On Marvellous Things Heard*, 835b, 31-32).

Athenaeus (*c.* A.D. 170–*c.* 230)

Author of the curious treatise *Deipnosophistae*, 'Sophists at Dinner' or 'Professors of the Dinner-Table', Athenaeus was a Greek hailing from Naucratis in Egypt who later settled in Rome. While he professes to tell a friend about a banquet at a scholar's house where learned guests brought poetry for recitation and discussion, much of his five surviving books are concerned with cuisine, exotic dishes, wines, and menus, and more trivial matters. In the following reference, Athenaeus quotes the archaic (6th century B.C.) lyric poet Sappho of Lesbos:

"These towels of radiant purple Mnasis hath sent to thee from Phocaea, gifts worthy to veil thy cheeks" (Athenaeus, *Deipnosophistae*, 9.410e).

Basilius (*c.* A.D. 329–79)

Born at Caesarea in Cappadocia, where he was later ordained bishop, St. Basil the Great was the brother of St. Gregory of Nyssa. Both men were destined to become influential Fathers of the early church, defending the orthodox faith against heretical beliefs. Basil was canonised soon after his death. As bishop of Caesarea he wrote several works on monasticism, theology, and canon law. In the *Hexaëmeron* ('Six Days'), nine Lenten sermons on the days of creation, Basil speaks of the varied beauty of the world as reflecting the splendour of God. His views on theology and ethics are also preserved in his letters, of which more than 300 survive.

"But since we ought not to pass over indifferently questions stirred up by an inquiring person, the winged creatures of the heavens and the fishes of the sea received at the very creation of the world the same origin. For both kinds were brought forth from the waters. And the reason is that both have the same peculiarity. For one swims through the water, the other in the air. On this account, therefore, was mention made of them in common. And the form of the expression as applied heterogeneously to fishes, and to all creatures that live in the waters, is indeed very appropriate. For the winged creatures of the sky are subject to man, as are also the fishes of the sea; and not only the fishes themselves but also all creatures that traverse the paths of the seas. For if a thing lives in water it is not necessarily a fish, as, for example, sea-monsters, whales, sharks, dolphins, seals, and also sea-horses, sea-dogs, saw-fish, and sea-cows, and, if you will, sea-nettles, cockles, and all testaceous animals, none of which are fish, and all creatures that traverse the paths of the seas; so that there are three kinds – birds of the sky, fishes of the sea, and all creatures that live in the sea, but are contrasted with fishes, though they also traverse the paths of the seas" (*Letters*, Letter CLXXXVIII, XV).

"And if there are certain aquatic animals which are provided with feet and have the ability to walk (very many of these are amphibians, such as seals, crocodiles, hippopotami, frogs, and crabs), they possess first, however, the ability to swim" (*Homiliae in hexaemeron*, 7,1, 33).

In the following passage drawn from his homily on Creation, Basilius expresses his awe at the numerous creatures that populate the seas, and implies that such diversity of life should inspire wonder at God's work:

"In these simple words [*i.e.* 'Let the waters bring forth crawling creatures' – Genesis 1,20], which species has been omitted? Which has not been included in the commandment of Creation? Would this be the viviparous animals, such as seals, dolphins, and rays, and those similar to them which are called selachians?" (ibid., 7,1, 38).

"And most of the cetaceans are viviparous: dolphins, and seals, both of which are also said to take up again in their belly, and thus protect, their young when these are still very small and have fallen prey to some terror" (ibid., 7,2, 20).[3]

Caelius Aurelianus (5th century A.D.)

Caelius Aurelianus, a Roman physician thought to have flourished around A.D. 420, is regarded as having played a crucial role in preserving Greek medical treatises, particularly those authored by Soranus of Ephesus (fl. 2nd century A.D.), who studied medicine at Alexandria and practised in Rome at the time of Trajan and Hadrian. From Numidia in Africa, Caelius Aurelianus translated Soranus' *On Acute Diseases* and *On Chronic Diseases* into Latin, thereby offering insights not only into the medical works and philosophy of Soranus, but also of other physicians such as Diocles, Praxagoras and Herophilus. A leading disciple of the Methodist school of medicine (which emphasised simple rules of practice), Soranus expressed his scepticism and disdain for more convoluted medical procedures that were often based on nothing more substantial than magic and superstition (Drabkin, 1950).

Addressing the disease of epilepsy, Soranus records the medical procedures employed by the leaders of non-Methodist sects:

"… And they try to produce a scab by employing drugs or burning with fire; and they prescribe trephining the skull, arteriotomy, venery, or, on the contrary castration. They give the patient ass's milk with salt to drink, or the blood of a sea turtle, or human blood, or that of a seal – and not merely the blood but the rennet" (*On Acute Diseases & On Chronic Diseases* [Ed. Drabkin, 1950], I 4, 116-118).

Noting in his criticism that "the great harm involved in all these prescriptions is clear upon examination," Soranus offers his own view of the seal's usefulness in treating epilepsy:

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[3] While Keller (1887) attributes this puzzling statement to fable, others claim that it arose from a simple linguistic error, in which Basilius confused the seal with a fish species of a similar name, φωχαινα (Pauly-Wissowa, 1894).

"…And, when milk is taken, it easily turns sour and causes the patient distress; it therefore seems ill-advised in cases of epilepsy. The same is true of the drinking of turtle's blood, human blood, and seal's blood, and the taking of rennet" (ibid., I 4, 128).

Later in the same chapter on epilepsy, Soranus vents his indignation at the treatments administered by Praxagoras of Kos (4th century B.C.). Praxagoras is regarded as a transitory figure in the history of medicine, straddling the old superstitions of the past, and the new, more rational, approach to the healing arts that was gradually emerging from Alexandria. Little is known about his life, and only fragments of his works survive. Despite doubts over his legacy to medical science (and Soranus' own criticisms), Praxagoras appears to have been seen as an outstanding authority in his own day, praised for his knowledge of anatomy even if his surgical procedures were considered somewhat daring. He is also credited with tutoring various physicians who rose to prominence in later years, including Phylotimos, Plistonicus, and Xenophon of Kos (Steckerl, 1958).

"Praxagoras in the second book of his *Therapeutics*, orders the head to be shaved. He applies massage and a poultice prepared from perfumed vinegar or wine, and excites sneezing in his patients and vomiting on the empty stomach for several days… He also treats the afflicted parts with burning and incision, and administers purgatives. When he sees the attack coming, he presses down these parts which are afflicted by the disease and rubs them downward with the secretion of a beaver and the private parts of a seal, or with the genitals of a hippopotamus (river horse), or with the blood of a tortoise or a marine flatfish. Thus he confuses everything" (*De morbis acutis et chroniis* [Ed. Steckerl, 1958], I 4, 133).

"…Caustic treatments are also harmful, for during the attack they aggravate the disease, since a state of inflammation is present… Equally harmful is the use of the rennet of a seal, or the genitalia or testes of a hippopotamus, or the blood of a turtle or turbot. All these substances are recommended not on the basis of any rule of reason but as having been tested by experience" (*On Acute Diseases & On Chronic Diseases* [Ed. Drabkin, 1950], I. 4, 135).

Soranus subsequently turns his attention to Serapion (thought to have been an Alexandrian Greek physician of the second century B.C.), finding similar cause to criticise his treatment of epilepsy:

"Serapion [in Book I of his *Treatments*] also gives the patient camel's brain and bile and seal's rennet… Like the epileptics themselves, his treatment falls to the ground" (ibid., I. 4, 139).

In a later chapter, Soranus finds cause to criticise the use of seal fat for the purposes of treating podagra:

"Now in cases of podagra some physicians prescribe a restorative ointment made from bramble toads; others anoint the patient's feet with the fat of a seal, and make slippers from the animal's skin. Others boil a hyena alive in oil, and still others do the same with a wolf, holding that this kind of ointment in particular is beneficial. For many remedies win adherents on specious grounds and without good reason…" (ibid., V.2, 48).

Callimachus (*c.* 310–*c.* 240 B.C.)

Callimachus, a Greek poet and scholar, was born in Cyrene in North Africa; later he became a leading figure in the literary elite in Alexandria. Aside from teaching grammar and poetry in the Egyptian city, Callimachus was also employed in the Alexandria library, regarded as one of the greatest centres of learning throughout the Hellenistic age. His works include a collection of wonders of the world, numerous monographs on subjects ranging from games and foreign customs to nymphs, birds, and rivers. His poems include *Hymns*, which were modelled on the Homeric Hymns, and also the *Aetia* and *Hecale,* which survive only in fragments.

"And Hera was grievously angered and spake to her: 'So now, O shameful creatures of Zeus, may ye all wed in secret and bring forth in darkness, not even where the poor mill-women bring forth in difficult labour, but where the seals of the sea bring forth, amid the desolate rocks' " (*Hymns*, Hymn IV, 238-243).

In the following fragment, Callimachus refers to the sea god Proteus as "Pallantean," an apparent reference to the seal shepherd's mythical origins in Pallene in Thrace. The poem celebrates the triumph of Queen Berenice II in the chariot race at the Nemean games. News of this victory – "the golden word" – came to the "islet of Helen" (an island of the Nile) and to Proteus, who in mythology was also held to be an early king of Egypt (Tina Marshall *pers. comm.,* 1996).

"…to the islet of Helen and to the Pallenean prophet, the herdsman of seals, came the golden word, beside the tomb of Opheltes Eupheteiades…" (*Fragmenta et titulus*, frag. 254,6).

Calpurnius Siculus (mid-1st century A.D.)

Latin poet Titus Calpurnius Siculus was the author of seven pastoral poems or *Eclogues*. Little is known of his life, but Calpurnius is thought to have been of Sicilian origin, living during the reigns of Claudius and Nero.

"Nor was it my lot only to see monsters of the forest: sea calves also I beheld with bears pitted against them and the unshapely herd called by the name of horses, bred in that river whose waters, with spring like renewal, irrigate the crops upon its banks... " [*i.e.* hippopotami, known as 'river-horses', originating from the Nile.] (*Eclogue* VII 64-8).

Diocletian (284-305 A.D.)

In 301 A.D., emperor Maximus Diocletianus instituted a command economy in an effort to tame rampant inflation and profiteering by merchants, hoarders and speculators. In a document known as the *Edict of Diocletian*, compulsory maximum prices were set for a wide range of goods and services, to be applied throughout the Roman domain (Radcliffe, 1926). Among over a thousand items listed in the Edict are furs and pelts, including those of the monk seal. See Table 1 (*The Edict of Diocletian*, C.8).

Diodorus Siculus (*c.* 80-20 B.C.)

A Greek historian, Diodorus of Sicily authored the 40-book *Library of History*. Although regarded as an uncritical compiler, he is particularly valued for reproducing the works of several writers that have been lost in their original form. These include the writings of Agatharchides of Cnidus, an Alexandrian geographer who was a prominent figure in the Egyptian court of Ptolemy VI in the 2nd century B.C.

"The first people we shall mention are the *Ichthyophagi* [fish-eaters] who inhabit the coast which extends from Carmania and Gedrosia [south-eastern Persia and Baluchistan] to the farthest limits of the arm of the sea which is found at the Arabian Gulf... [the Red Sea]. They have their dwellings not far from the sea along the rocky shores, where there are not only deep valleys but also jagged ravines and very narrow channels which Nature has divided by means of winding side-branches. These branches being by their nature suited to their need, the natives close up the passages at their outlets with heaps of great stones, and by means of these, as if with nets, they carry on the catching of the fish. For whenever the flood-tide of the sea sweeps violently over the land, which happens twice daily and usually about the third and ninth hour, the sea covers in its flood all the rocky shore and together with the huge and violent billow carries to the land an incredible multitude of fish of every kind... but whenever the time of ebb comes, the water flows off little by little through the heaps of rocks and ravines, but the fish are left behind in the hollow places... Thereupon the women and children, seizing the smaller fish which are near the shore, throw them on the land, and the men of bodily vigour lay hands upon the fish which are hard to overcome because of their size; for there are driven out of the deep creatures of enormous size, not only sea-scorpions and sea-eels and dog-fish, but also seals and many other kinds which are strange both in appearance and in name. These animals they subdue without the assistance of any skilful device of weapons but by piercing them through with sharp goathorns and by gashing them with jagged rocks... (*Library of History*, Book III, 15.1 - 15.7).

Chiefly drawing on the reports of Agatharchides, Diodorus then turns his attention to the *Ichthyophagi* who lived along "the coast outside the gulf... banished by fortune from the inhabited regions into the desert" (ibid., Book III, 18.1).

"And the most marvellous fact of all is that seals live with these tribes and catch the fish for themselves in a manner similar to that employed by the human beings. Likewise with respect to their lairs and the safety of their offspring these two kinds of beings place the greatest faith in one another; for the association with animals of a different species continues without any wrongdoing and with peace and complete observance of propriety. Now this manner of life, strange as it is, has been observed by these tribes from very early times, whether it has been fashioned by habit over the long space of time or by need imposed by necessity because of stress of circumstance" (ibid., Book III, 18.7).

Again using Agatharchides as his source, Diodorus describes a voyage along the eastern coast of the Red Sea:

"But we shall now take up the other side, namely, the opposite shore which forms the coast of Arabia, and shall describe it, beginning with the innermost recess. This bears the name Poseideion [the present Ras-Mohammed, at the southern tip of the Sinai Peninsula] since an altar was erected here to Poseidon Pelagius by that Ariston who was dispatched by Ptolemy to investigate the coast of Arabia as far as the ocean. Directly after the innermost recess

is a region along the sea which is especially honoured by the natives because of the advantage which accrues from it to them. It is called the Palm-grove and contains a multitude of trees of this kind which are exceedingly fruitful and contribute in an unusual degree to enjoyment and luxury... After sailing past the Palm-grove one comes to an island off a promontory of the mainland which bears the name Island of Phocae from the animals which make their home there; for so great a multitude of these beasts spend their time in these regions as to astonish those who behold them" (ibid., Book III, 42.1-5).

Dioscorides Pedanius (*c.* A.D. 40– *c.* 90)

A Greek physician and pharmacologist, Dioscorides Pedanius was born in Cilicia in Asia Minor. Travelling as a surgeon with the armies of the Roman emperor Nero, he studied the characteristics, distribution, and medicinal properties of numerous plants and minerals. Written in five books around the year 77 A.D., his *De materia medica* provided detailed descriptions of nearly 600 plants and approximately 1,000 simple drugs. It continued to serve as the primary text for pharmacologists until the end of the 15th century.

"And the rennet of the seal is like castor with respect to its power, and it seems to be especially suitable for epileptics and hysterical choking [*i.e.* blockage or disruption of the cervix] when it has been drunk. It can be tested, whether it is of the seal, in this way: take the rennet of some other animal, especially of the sheep, and, having poured water over it, allow it to stand for a short time, and then afterwards, pour the infusion down upon the seal rennet; for if it is true it will become watery quickly, but that which is not of such a kind remains the same. And the rennet is taken from the seal when the cubs are not yet able to swim. All rennet commonly solidifies things which have been dissolved, and dissolves things which have been condensed" (*De materia medica*, 2,75,2,7 *et seq*.).

In the following passage, seal rennet is listed among substances effective for waking people affected by lethargic fever when applied to the patient's nostrils (Tina Marshall *pers. comm.,* 1996):

"…vinegar, white hellebore, mustard, pepper, castor, soap-wort, spondylium, sulphur-wort, seal rennet, oil of kedrelate, raw pitch, rue, wormwood, lamp-wick…" (*Euphorista vel de simpliciis medicinis*, 1,14,1,3).

In a later passage, seal rennet is listed among agents of fumigation to treat lethargic fever (Tina Marshall *pers. comm.,* 1996):

"…spondylium, gum of Ferula persica, horse or mule lichen, elephant nail and shavings of the tooth, deer horn, rennet of the seal and of the kid, dirt of the he-goat, crocodile fat, wormwood, laserwort…" (ibid., 1,15,1,7).

Dioscorides also cites seal rennet as an ingredient in a treatment for epilepsy, the text implying that the recommended mixture be consumed by the patient (Tina Marshall *pers. comm.,* 1996):

"Also effective [for epileptics] is stork dung with water, with oxymel and [measurement] of tree fungus, the same amount of sulphur-wort, and the same amount of seal rennet [measurement], these ingredients beaten smooth, or the root of rest harrow boiled in oxymel down to one half" (ibid., 1,19,2,5).

Dioscorides' recommended treatments for epileptics continue with mixtures which are beneficially drunk with sour wine mixed with water (Tina Marshall *pers. comm*., 1996):

"The rennet of the seal with horse lichen, and these same lichens by themselves, flower of wild violet, flower of Assian stone and especially for young children" (ibid., 1,20,2,1).

Seal fat is recommended as an ingredient in an ointment to treat leprosy (Tina Marshall *pers. comm*., 1996):

"Root of Cardopatium corymbosum boiled together with vinegar, anointed with a decoction of brimstone and asphalt mixed, or without these, seal fat and solution of blue vitriol and cedar oil mixed, ink with unfired brimstone and glue of bull hide and vinegar, juice of laserwort together with vinegar" (ibid., 1,121,3,8).

In a later passage, Dioscorides lists seal rennet among agents of fumigation used in rousing women who are suffering from strangulation of the womb (Tina Marshall *pers. comm*., 1996):

"…dye of the purple-fish, sulphur-wort, juice of Ferula persica, spondylium, asphalt, castor, Ferula galbaniflua, horse lichen, seal rennet, laserwort, deer horn..." (ibid., 2,92,1,3).

Eustathius (12th century A.D.)

Living in the latter half of the 12th century A.D., Eustathius was a native of Constantinople and later became archbishop of Thessalonika. Commonly regarded as the most learned man of his age, his classical commentaries on Homer's *Iliad* and *Odyssey* are said to incorporate much ancient learning that has not survived elsewhere, providing additional insights into the history, language, geography, and mythology of the two works. Many of the

seal references listed below are of a purely grammarian interest, reflecting Eustathius' efforts to analyse Homer's use of language.

"The city of Plataia derives its name from the word for oar blade, *plate* [which can also signify the oar handle], so just as the significance of Phocaea is explained by the seal, *phoke*, and the significance of Nikaia is explained by *nike* 'victory', so the significance of Plataia is explained by *plate*, the oar blade" (*Commentarii ad Homeri Illiadem* (lib.A-P), Vol. 1, page 409, line 16).

"It should be made an object of investigation that perhaps Lacedaemon is called '*ketoessa*' also on account of the fact that the sea which girds the land there is sea-monster nourishing ['ketotrophon'] and thus full of wild beasts, just as Herodotus says that the sea around Athos is extremely full of wild beasts. And it is probable that such a sense underlies '*ketoessa*' also in accordance with the analogy of Phokaia, which derives its name from a sea monster, the seals. We are speaking of Phokaia, the Asian city, which is said to be the start of the Ionian territory, and the end of Aiolian" (ibid., Vol. 1, page 454, line 13).

"It should be known also that, just as the derivation arises through the 'eia', so it does through the 'aia', as the seal explains Phokaia, victory Nikaia" (ibid., Vol. 1, page 709, line 24).

The following passage reflects the grammarian's interest in Homer's use of the epithet "well-fed" as it appears in the *Iliad*. Eustathius informs us that the term is also found in the *Odyssey* referring not only to livestock, but also to seals (the *Odyssey*, Book 4, line 451) (Tina Marshall *pers. comm.,* 1996):

"The *Odyssey* shows that not only bulls, but also pigs, goats and seals are 'well-fed'" (ibid., Vol. 2, page 449, line 15).

"It is known to those who occupy themselves with words that *nike* ['victory'] is also the name of a city, from which [the word] *Nikaia* is derived in accordance with *phoke, Phokaia*…" (ibid., Vol. 3, page 662, line 6).

"Note that according to the poet, Halosydne is not one of the Nereids, but here it is the epithet of Thetis. In the *Odyssey,* however, it seems to be the name of a Nereid in the following passage: 'seals, children of beautiful Halosydne'. Unless, that is, it is there the epithet of the sea. Callimachos wanted to name it differently, and he alone reads *hudatosydne*, changing *halosydne*" (ibid., Vol.4, page 153, line 17).

"'…then the infallible old man of the sea [Proteus] comes out of the sea, with a blast of the west wind, covered by a dark sea ripple, and after coming out, he lies down in hollow caves. And around him the seals, children of beautiful Halosydne, sleep in heaps, having emerged from the grey sea and breathing forth a pungent odour of the very deep sea. I [the goddess Eidothea] leading you there at the coming of dawn, shall lay you down in a row.' Then she advises Menelaus to choose out three other excellent men. And she reveals all the deadly arts of the old man. That, clearly, first he shall count the seals and count them over. When he shall finish counting them all, he shall lie down in their midst, as a herdsman among flocks of sheep" (*Commentarii ad Homeri Odysseam*, Vol. 1, page 172, line 35).

"…and a certain dignity is characteristic of the west wind as Proteus rejoices in it. And about the ripple, the words of the Iliad and those of the author of geographical descriptions are clear. The opening is a ripple. And the scholiasts say that the seals are useful for magical witchcraft. Wherefore Proteus also rejoices in them" (ibid., Vol. 1, page 173, line 9).

"And they [the seals] are *nepodes,* not being, as fish are, footless [*apodes*], but small-footed [*oligopodes*] or tiny-footed [*mikropodes*] and on this account they are almost footless. But some people say that seals are *nepodes* from the fact that they swim with their feet. So that seals would be webfooted [lit. 'swim-footed' – *nexipodes*]. And about Halosydne it is written in the fourth book of the *Iliad*. It must be said now that we are dealing with a myth, as he [*i.e.* Homer] knows her to be one of the Nereids. And on this account he says she is beautiful, in accordance with the personification. Halosydne, however, is beautiful in another way, since water also is called splendid. But others think that this is the epithet of Amphitrite. They do not derive the word from the water, but from 'to dart along in the sea' [*en hali suesthai*]. And others say 'Halosydnai' in the plural. That is, 'to be wet in the sea' [*en hali deuomenai*] or 'to dive into the sea' [*eis hala dunousai*]. It is to be known also that the seals are imagined as being the possession of Halosydne. One shall either understand the seals themselves as belonging to Halosydne, or that it is the *nepodes* which are of Halosydne. And it is for this reason that he said that Proteus lies in their midst, as a herdsman among flocks of sheep. Indeed, those creatures too are the possessions of men. And some have said that it was expressed thus by reason of a manner of kinship. For they say that the seals are *nepodes* of the sea, that is, children. For according to a certain gloss, '*nepous'* is a 'descendant'. And 'the sharp odour' is said in Attic. As is, a little later on, 'the deadliest odour of seals'. [...] And the poet shows more clearly in the following verses, that the seal smells grievously" (ibid., Vol. 1, page 173, line 14+20).

"Proteus counts the seals, since perhaps this is characteristic of him. Or also with a view to the rhetorical persuasiveness of the herdsman among flocks of sheep. For the herdsman also counts the animals under his care" (ibid., Vol. 1, page 173, line 33).

"[Homer says] That Eidothea, having brought four newly-flayed seal skins out of the sea, and having scooped out beds in the sand, sat waiting for Menelaus and his companions. And when they had come, 'she made us to lie down in a row, and cast a skin over each. Then would our ambush have proved most terrible, for terrible did the stench of the brine-bred seals distress us – for who would lay himself down by a beast of the sea?' Indeed, no one at all, clearly. 'But she of herself delivered us, and devised a great boon; she brought and placed ambrosia beneath each man's nose, extremely fragrant, and destroyed the stench of the beast.' And their hope is good, since there was ambrosia there. Their hope is to return to their native land by means of the ambush. Mythically, at any rate, such ambrosia now does not provide sustenance, but is something sweet-smelling. And see here the figure of speech of keeping silence. For he says that the skins were newly stripped off. But he does not say who stripped them off. And note that now he said in full the skins of the seals. But a little later, he said the same thing in respect to the seals in this verse, 'the deadliest odour of the seals.' He called the part by the name of the whole. As he also does when he says the tusk by the name of the elephant, and the hide, the ox" (ibid., Vol. 1, page 175, line 26+35. Quotations from the *Odyssey*: Loeb Classical Library edition, 1995).

"'The beast of the sea' refers periphrastically to the seal, certainly not to a simple sea monster" (ibid., Vol. 1, page 176, line 15).

"[Note] that concerning Proteus he narrates thus. 'At midday the old man came out of the sea. And he found his well-fed seals. And then he approached all of them and counted their number. And he counted us among the first of the sea monsters. He did not at all know in his heart that it was a trick. Then he also lay down'" (ibid., Vol. 1, page 176, line 23).

"…the wise man must use a prescribed regimen and not now at one time, now at another. They say that even Proteus made a habit of going to the same place and counting his seals and lying down with them. And see that '*lekto*' appears here twice; it has a double interpretation. For on the one hand he counts [*lekto*] the number, instead of '*arithmese*'. And he himself lay down [*lekto*] (ibid., Vol. 1, page 177, line 19).

"'Well-maned' is not mentioned in order to induce fear, but simply because it is the distinguishing feature of the lion. Likewise also this phrase, 'well-fed seals', since seals have much fat" (ibid., Vol. 1, page 177, line 23).

"And he does not say '*zatrepheas*' ['well-fed'] sheep but '*eutrepheas*' ['well-fed'] ones, for '*zatrephes*' was assigned to the seals. And likewise the poet also of set purpose expressed alliteratively 'the well-fed sheep' in opposition to 'the well-twisted twigs' for the sake of sweetness (ibid., Vol. 1, page 354, line 30).

"Now he says the hogs are 'well-fed', just as a little later he also says the same of goats. And before these he related that seals too are well-fed" (ibid., Vol. 2, page 58, line 32).

Galenus (*c.* 129-204 A.D.)

Galen of Pergamum is regarded as one of the most outstanding figures in medical science during the Greco-Roman era. Turning to medicine at the age of sixteen, he studied at Pergamum, Smyrna, and Alexandria. He was appointed doctor to the gladiators at Pergamum in A.D. 157, but later moved to Rome where he became physician to the emperors, Marcus Aurelius, his son Commodus, and Septimus Severus. Some 350 works bearing his name have been judged authentic, covering almost every branch of medicine, particularly physiology and anatomy. His writings formed the cornerstone of all later medical works, and he was considered the epitome of medical perfection throughout the Middle Ages.

"...all warm, full-blooded animals living in water, such as the dolphin, seal, and whale, breathe air in a certain marvellous kind of respiration..." (*De usu partium*, 3,444,8).

In the following extract, Galen refers to the works of Phylotimos (sometimes referred to as Philotimos), a physician of early Hellenistic times who was a pupil of Praxagoras of Kos around 300–260 B.C. Only fragments of his work survive, with citations of '*peri trophes*' ('On Nourishment') appearing in Galen, Athenaeus and Oribasius. The second and third books of *peri trophes* were devoted to fish, divided into hard-bodied and soft-bodied species (Pauly-Wissowa, 1894). Galen, discussing Phylotimos' classification, criticises, supplements, and modifies the list of his predecessor, while agreeing with his general conclusion that the class of fish with tough flesh are more difficult to digest than those of soft flesh (Tina Marshall *pers. comm*., 1996):

"After these he [Phylotimos] lists the dog-fish [sharks], which should be counted among the cetaceous [species], as they have tough and excretive flesh, and on account of this are cut up and salted, being the food of common men; for these are distasteful and slimy, wherefore they eat them with mustard and also with vinegar-oil sauce and likewise pungent sharp and sour compound dishes. Also of this kind are the whales and the dolphins and the seals; and the great tunny-fish are also closely related to them…" (*De alimentorum facultatibus* libri iii, 6,728,9).

"Something has been said just now and also earlier about the cetaceous animals in the sea, to which belong seals and whales, dolphins and hammerhead sharks and the large tunas, and in addition to them, the dogfish, and all others of such a kind; also now it is to be said of them summarily, that all creatures of such a kind have hard [bitter, tough] flesh which creates bad fluids and a lot of excess substances. Therefore people usually salt them before use, bringing it about that the nourishment derived from them is more refined as it is distributed in the body, and on account of this it is digested faster and better converted into blood. For in a fresh state, whenever it has not been digested very well, it collects a large amount of raw fluid in the vascular system" (ibid., libri iii, 6, 737, 15; from *Werke Des Galenos*, Hippokrates-Verlag, 1952).

In the following passage, Galen lists foods whose consumption, he believes, causes "melancholic blood," *i.e.* black bile (Tina Marshall *pers. comm*., 1996):

"No less does the eating of hares produce this kind of blood, and much more so, the eating of wild boars; snails too produce the melancholic blood, if one eats too much of them, and all the preserved meats of terrestrial animals; and of the sea creatures, the meat of tunny-fish and whale and seal and dolphin and dog-fish and all the cetaceous creatures" (*De locis affectibus* libri vi, 8, 183, 18).

"12. [About the rennet of the seal.] They recommend that the rennet of the seal is especially fitting as the power of castor…" (*De simplicium medicamentorum temperamentis ac facultatibus* libri 12, 274, 17).

In the following extract, Galen cites a treatment for baldness recommended by the physician Andromachos the Younger (1st century A.D.). Active in Rome, Andromachos was the author of three pharmacological monographs (on external, internal, and ophthalmological treatments respectively), that were largely compilations of earlier remedies. While Galen often criticised them for imprecision, this did not prevent him from extracting entire passages, often word for word.

"Another treatment for baldness, which Andromachos the Younger used. Taking out six bellies of hares and drying them, roast them in an earthen vessel. In addition to these take a fourth part of myrtle berries and an equal amount of twigs, and a fourth part of maidenhair (Adiantum Capillus-Veneris). Roasting all these things immediately, chop them and sift through a fine sieve, then casting upon [the mixture] an equal amount of bear and seal fat, beat, and gathering in a leaden box, preserve it, and upon use dilute it with whatever seasoning you like" (*De compositione medicamentorum secundum locos* libri x,12,438,17).

In the following passage, Galen describes medicines to apply in the case of painful sinews, rheumatism, arthritis, and gout. Drawing on a remedy recommended by Domitius Nigrinus (an obscure physician whose biography cites him only in context with this treatment), the application of a mixture containing seal fat to the affected areas is said to free the patient from "the whole condition" (Tina Marshall *pers. comm*., 1996).

"…Six uncias of grape juice. Six uncias of hedychrum. Six of amaracus. Six of seal fat. If this is not present, one must use the marrow/fat of a very old stag. A pound of beeswax… This preparation is to be used after the gout remedy prepared by Sabernius Valens, which is entitled Pompeian Precious" (*De compositione medicamentorum per genera* libri vii,13,1021,12).[4]

Geoponica (*c.* A.D. 950)

The Geoponica, known by its full title as *hai peri georgias eklogai* ('Excerpts about Agriculture') is a collection of agricultural information compiled around 950 A.D. for Byzantine Emperor Constantine Porphyrogenitus VII. The twenty books that compose the Geoponica cover various agricultural topics, ranging from fruit and livestock to vine cultivation and fish. While the anonymous compiler(s) responsible for the treatise retained little of the respected works of earlier agricultural authorities, procedures based on magic spells and superstitions were cited frequently. In cultural, historical and technical terms, the Geoponica is therefore regarded as inferior to other agricultural writings that have survived from antiquity (White, 1970).

"Cap. 14. On Hail. The African.

3. And when a leather strap of seal skin has been hung from one prominent vine, no damage comes from hail, as Philostratos relates in his historical work… 5. Again, if you lead with you around the area the skin of a hyena or crocodile or seal, and hang this up in front of the gates of the dwelling, hail shall not fall" (*Geoponica*, 14.3 - 5).

"Cap. 33. On Corn Rust. The Beirutian.

7. And likewise it acts as a remedy, if the hide of a seal is perforated and stretched around a sieve, and the seed is sifted through the sieve, and the land is sown. And this same thing [*i.e.* the seal hide] prevents the falling of hail, as it brings help through a certain natural antipathy" (ibid., 33.7).

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[4] Under the Roman system of weights, an *uncia* or ounce (a twelfth of a pound), was equivalent to 27.29 grams.

Gregorius Nyssenus (*c.* A.D. 335– *c.* 394)

Born in Caesarea, in Cappadocia, Gregory of Nyssa was the younger brother of Saint Basil the Great. Primarily a scholar, he wrote many theological, mystical, and monastic works in which he sought to balance Platonic and Christian traditions. In 372 A.D. he was consecrated as bishop of Nyssa, a small city in the new province of Cappadocia Secunda, which Basil wished to retain in his ecclesiastical jurisdiction.

In the following passage the Church Father discusses the "creation of man," elaborating on Genesis 1.28, that "man" shall "have dominion over the fish of the sea" (Tina Marshall *pers. comm.,* 1996):

"Thus the power to rule everywhere, implanted by the Creator, is granted to man. Hence the swordfish and the hammer-headed sharks and the whales and the priones and the seals and all those fearful names of sea monsters have come under the command of man" (*De creatione hominis sermo primus*, 18a, 8).

Heraclides (2nd century B.C.)

Heraclides Lembus, a statesman and scholar of the 2nd century B.C., gained recognition as a literary critic, compiler and writer of epitomes. He lived under the reign of Ptolemy VI Philometor, the Macedonian king of Egypt, and he employed the Alexandrian geographer Agatharchides as his secretary. Among his works is *Excerpta politiarum,* a series of excerpts from a lost treatise of Aristotle's on constitutions (the *Politiae*). The following reference, previously attributed to Heraclides Ponticus, a Greek philosopher and astronomer of the 4th century B.C., concerns the founding of the city of Phocaea in Asia Minor (Tina Marshall *pers. comm*., 1996):

"[Constitution of the Phocaeans]. Some say Phocaea was named after the leader Phocus, others (from the fact) that they saw a seal (*phoke*) coming to dry land" (*Excerpta politiarum*).

Hippiatrica (*c.* 950 A.D.)

'Hippiatrica' is the title of a compilation of Greek veterinary (especially equine) medicine, which was compiled under the reign of the Byzantine emperor Constantine Porphyrogenitus VII (912-959 A.D.). In two books, the *Hippiatrica* comprises 129 chapters, and is based on the work of 134 writers. Because of the work's function as a text-book, various versions of the material survive in the manuscript tradition. The 'Parisian' *Hippiatrica* (*Hippiatrica Parisiana*) is a 15th century compilation, while the 'Cambridge' version (*Hippiatrica Cantabrigensis*) dates back to the 12th century.

In the following passage, seal fat is recommended in the treatment of discharging wounds affecting horses' feet:

"About discharge in the feet or chirama. Apsyrtus of Delos, and we also, have this from experience: anoint the pasterns with one uncia of iarios and honey, and if moisture is carried, 2 uncias of litharge. And we learnt that seal fat also works well" (*Hippiatrica Cantabrigensis*, 41,1,5).

A later passage in the *Hippiatrica* concerns a treatment advocated by Theolactes the Patriarch for an ill-defined disease affecting horses' feet (Tina Marshall *pers. comm.,* 1996). The author recommends that the affected area be cleansed with a depilatory, then exposed to a vapour bath. The area is rubbed down with a vinegar- and salt-soaked hairy rag until blood flows…

"and taking some unguent, such as contains juice of orange-tawny shittah tree, pine resin, scraped rust, litharge, white lead, yellow orpiment divided, dross of lead, wild grape, beetles, two uncias of moist pitch, wheatmeal made of bitter vetch, bruised beans, pomegranate peels, oak gall, live asbestos, one uncia of crystalline stone pounded smooth, [measurement] of swine dung, likewise dog dung, nine uncias of swine fat, three uncias of seal fat; sifting everything with a fine sieve throw the fats and the moist pitch on these, and softening the skin thoroughly, plaster it up in a linen rag and bind it" (ibid., 80,23,8).

In the *Hippiatrica Parisiana*, another treatment calling for seal fat is listed for malignant mange in horses:

"Another wholesome remedy. In the beginning stages, add seal fat. But if it [the mange] has already hardened, it is necessary to use more vigorous and stronger remedies. For which reason use this: add asphalt, sulphur, vinegar, moist pitch and very old grease, dissolving them in equal measure and uniting them, scraping the mange beforehand, however, with an iron tool and washing it away with human urine" (*Hippiatrica Parisiana*, 306.2).

Hippocrates (*c.* 460-380 B.C.)

Although widely acclaimed as the 'Father of Medicine', the life of Hippocrates remains shrouded in mystery. The scarce evidence that does survive, however, suggests that he was born on the island of Kos in the Eastern Aegean, and in later life became an Asclepiad, a member of a guild of physicians which claimed descent from Asclepius, the god of healing. While some 60 treatises comprising the Hippocratic Corpus have survived, not one can be positively attributed to him personally. It is thought that these works, ranging from general health care and diagnosis, to surgery, anatomy and pharmacology, may have originally been the contents of a library associated with the healing shrine of Asclepius, the ruins of which can still be seen today on Kos.

In the following passage, seal oil is listed among several fumigation agents as a therapy for uterine disturbances (Tina Marshall *pers. comm*., 1996):

"Whenever the womb chokes, it is necessary to burn for fumigation all the ill-smelling things under the nose, asphalt, brimstone, horn, lamp-wick, seal oil, castor; and under the pudenda the sweet-smelling things" (*De natura muliebri*, 26,2).

The therapy is repeated, with variations, in two subsequent chapters:

"…myrrh, frankincense, pouring sweet oil over them, burn for fumigation. Asphalt, mixing in barley husks, burn for fumigation. Soaking brimstone in seal oil, burn for fumigation" (ibid., 34,7).

"…mixing it up well with honey, burn for fumigation. Soaking goat dung and hare fur in seal oil, burn for fumigation. Beating the skin of the seal milk smooth and mixing together sponge and liverwort until smooth, preserving them in seal oil, burn for fumigation. Burn for fumigation goat dung and seal lungs and sawdust of cedar" (ibid., 34,26).[5]

In the following extract, seal oil is applied to the nostrils of a woman who has lost the power of speech while suffering from suffocation of the uterus as a result of its dislocation (Tina Marshall *pers. comm*., 1996):

"If her mouth is closed tight and she is unable to speak, make her drink castoreum in wine. Dip your finger in seal oil and wipe inside her nostrils. Insert a wool pessary, until the womb returns, and remove it when the symptoms disappear" (*De mulierum affectibus* i-iii, 126,15 [Eds. Lefkowitz & Fant]).

If the dislocation persists after removing the pessary, Hippocrates continues, the treatment should be continued with fumigation, creating as much smoke as possible, the patient inhaling the vapour through the nose for as long as she can tolerate it:

"It is best to use a fumigation of seal oil: put the coals in a pot and wrap the woman up – except for her head. So that as much vapour as possible is emitted, drip a little fat on it, and have her inhale the vapour" (ibid., i-iii, 126,21).

In the following two passages, Hippocrates turns his attention to complications resulting from the closure of the cervix, caused by dislocation of the uterus. Fumigation, again using seal oil, is performed in order to reopen the cervix and to fill the uterus with air. The therapy calls for the woman to sit on a reed which has been inserted into a jar for the treatment to be administered (Tina Marshall *pers. comm.,* 1996):

"One must throw dry garlic into the pot, and pour water over it, so that it covers two fingers, and soak it as much as possible, and pour on it also the oil of the seal; and thus heat it. One must fumigate for a long time" (ibid., i-iii, 133,60).

"This fumigation fills up the uterus with air and draws it more to its proper position and opens it up. So since the fumigation is of this nature and is able to do these things, one must fumigate in this way. Whenever you fumigate, you must throw down some garlic and pour some seal oil on it; one must do these things, until the uterus seems to be filled with air, and the orifice is drawn firmly upwards; such things will come about with this fumigation" (ibid., i-iii, 133,70).

In another treatment for suffocation of the uterus, Hippocrates recommends seal fat – among other potable medicines – to be consumed by the patient (Tina Marshall *pers. comm.,* 1996):

"Whenever there is choking by the womb: let her drink castor and fleabane in wine, separately and together in the wine. Or three obols of asphalt, or a pinch of seal fat. Give her peony root to drink in the sweet-smelling wine, in a proportion of half-and-half" (ibid., i-iii, 200,3).

In the following treatment, Hippocrates recommends that fumigation be performed if the dislodged uterus is pressing on the groins of the patient. A variety of effective mixtures are listed, including seal oil, the skin of seal milk/rennet beaten smooth, and seal lungs (Tina Marshall *pers. comm.*, 1996):

"If ever they press into the groins and exert much pressure, burn for fumigation goat dung and hare fur, soaking them in seal oil. Or dry the fruit of the tree-medick or the leaves, or mixing the bark and leaves of the oak and

[5] *Cf. De mulierum affectibus* i-iii, 203,26.

the resin, soak them in oil, and burn for fumigation. Or beating the skin of the seal milk smooth, and the sponge and the liver-wort smooth, mix them with seal oil, and burn for fumigation. Burn for fumigation goat dung and seal lungs and sawdust of cedar. Or cow dung, or shavings of ox horn and asphalt, or fruit of Egyptian thistle…" (ibid., i-iii, 203,26).[6]

In Hippocrates' *De exsectione foetus*, seal oil is employed as an ointment to be applied to an inflamed uterus following surgical incision of the membrane, a procedure undertaken in order to remove the foetus (Tina Marshall *pers. comm.,* 1996):

"Cut the membrane of the uterus according to its natural conformation and sideways, rub it with a linen cloth so that it becomes inflamed, and then anoint it with seal oil or pitch, plaster it together with pomegranate flowers, and apply to it soft sponges which have been steeped in wine, fastening them from the shoulders" (*De exsectione foetus* 5,5).

Hippolytus (3rd century A.D.)

Hippolytus was an ecclesiastical writer of the 3rd century A.D. In his work *Refutatio Omnium Haeresium*, he refers to the Greek poet and philosopher Xenophanes (*c.* 570–*c.* 478 B.C.), whose writings only survive in fragments. Xenophanes spent much of his life wandering through Greek lands, particularly Sicily. In the quarries of Syracuse, he noted the presence of fossilised fish and other marine organisms, concluding that the land had once been flooded by the sea, and might be so again.

"Xenophanes teaches that there arises a mixing of the land with the sea and that in time it is dissolved by the wet, asserting that there are proofs of such a kind: that in the middle of the earth and mountains are found cockles, and he says that in the stone quarries of Syracuse tracks of fish and of seals have been found, and on Paros tracks of sardines in the depth of the stone, and on Melita stone slabs of manifold sea creatures. He says that these creatures were born when everything had been covered with mud for a long time, and that their tracks dried up in the mud. That all men were destroyed, when the earth was carried down into the sea and became mud, and that thereafter the race began again, and that this change occurred in all worlds" (*Refutatio Omnium Haeresium* 1.14).

Homer (*c.* 850 B.C.)

Living in the 8th century B.C., the Greek epic poet Homer is believed to have hailed from Chios or Smyrna. Tradition depicts him as blind, as were the bards in the *Odyssey,* and yet most details of his life are based on interpretation and supposition rather than on concrete facts. The poems attributed to Homer, the *Iliad* and *Odyssey*, are said to symbolise the end of the Dark Ages, when Greek literature was first set down in writing. Despite many centuries of debate regarding authorship, on balance, academic opinion now views both poems as being the work of a single individual.

In Book IV of the *Odyssey*, King Menelaus recounts his own difficulties in reaching home as the gods sought to punish him for failing to offer them proper tribute after the conquest of Troy. Still struggling to escape years of exile in the southern waters of Phoenicia, Ethiopia and Egypt, Menelaus and his men found themselves nearing starvation while stranded on the Egyptian island of Pharos. It is at this point in the narrative that Eidothea appears, "daughter of the mighty Proteus the ancient sea-god". Readily acceding to his pleas for assistance, the sea-nymph advises Menelaus that he must take advantage of Proteus' potent prophetic powers. Only by capturing the sea-god could Proteus be forced to reveal which of the Olympian gods was thwarting the Spartan King and keeping him from reaching home (Graves, 1955):

"The goddess answered: So be it, stranger; I will tell you all without deceit. When the sun in its course has reached mid-sky, the sage old sea-god leaves his ocean – the west wind blows then, and the ruffled water is dark enough to hide him. Once ashore, he lies down to sleep under the arching caves, and around him is a throng of seals, the brood of the lovely child of Ocean; they too have come up through the grey waters, and they too lie down to sleep, smelling rankly of the deep brine below... First he will pass along all the seals and count them; then, having viewed them and made his reckoning, he will lie down among them all like a shepherd among his flock of sheep" (The *Odyssey*, IV.398 *et seq*.).

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[6] *Cf. De natura muliebri*, 34,26.

The goddess warns Menelaus that it will be necessary to deceive the cunning Proteus to reveal his oracular knowledge. To achieve this, she must first cloak Menelaus and his men in seal skins:

"The goddess, I said, had sunk down through the wide and yielding waters; now she returned, bringing back the skins of four seals, all newly flayed – such was her scheme to deceive her father. She hollowed out hiding-places for us inside the sea-sand, then sat there waiting; when we had come right up to her, she made us lie down side by side and threw a skin over each of us. Our lying there might have been intolerable, for the hideous stench of the briny creatures distressed us monstrously; who would choose a sea-calf for bedfellow? But the goddess found us rescue and remedy. She brought every one of us ambrosia and put it underneath his nostrils; it smelt delectably; and so she countered the bestial stench" (ibid., IV.432 *et seq*.).

"...All the morning we waited there in patience; then the seals came thronging out of the sea and lay side by side near the breaking billows. At noon the old god came out of the sea as well, and found the sleek seals already there; he began to pass down the whole line of them, counting them, and among his flock he counted ourselves first of all, never guessing that treachery was afoot..." (ibid., IV.442 *et seq*.).

In Book XV of the *Odyssey*, Artemis, the goddess of hunting, exacts divine retribution against a servant woman who had allowed herself to be seduced by a band of Phoenician traders on the island of Syros:

"We sailed for six days, day and night; but when Zeus brought the seventh day also, Artemis with a shaft of hers struck the woman, and sent her – like a sea-swallow diving – to tumble below into the hold. The sailors threw her overboard to be a prey for the seals and fishes" (ibid., XV.476).

Homeric Hymns

Though ascribed in antiquity to Homer, the Homeric Hymns are of uncertain date and authorship. The collection is composed of 34 ancient Greek poems, all addressed to gods. While the collection contains major hymns to Demeter, Apollo, Hermes, and Aphrodite, others – among them, devotional songs to Zeus, Hera and Poseidon – are incomplete or survive only in fragments. According to some academics, internal evidence indicates that the Hymns were composed by different writers over an extended period of time, ranging from the 8th to the 4th centuries B.C. (Athanassakis, 1976).

"…Therefore, I greatly fear in heart and spirit that as soon as he sees the light of the sun, he will scorn this island - for truly I have but a hard, rocky soil - and overturn me and thrust me down with his feet in the depths of the sea; then will the great ocean wash deep above my head for ever, and he will go to another land such as will please him, there to make his temple and wooded groves. So, many-footed creatures of the sea will make their lairs in me and black seals their dwellings undisturbed, because I lack people" (The Homeric Hymns, To Apollo 70-78).

Joannes Chrysostomos (*c.* A.D. 347–407)

Regarded as one of the Fathers of the early Church, Saint John Chrysostom was born in the Syrian city of Antioch. Initially abandoning theology to become a hermit monk, he later returned to the church as a deacon. Gaining influence as he rose through the ranks, he was eventually appointed archbishop of Constantinople. His castigation of the abuse of wealth, however, earned him enemies among the rich and powerful, who orchestrated his banishment. Although known as a biblical interpreter, Joannes Chrysostomos was also renowned for his zealous style of preaching. His barbed comments are said to have provoked laughter in the congregations of Antioch and Constantinople, gaining him much favour among common people, and earning him the Greek surname meaning 'golden-mouthed.'

"For how, tell me, shall he be able to cut down his passions, when the point is blunted, and bent back like a lead ruler? How shall he wound the Devil? And to whom is a man cultivating fleshiness not disgusting, crawling as he does after the manner of a seal? I am not speaking of those who are so by nature, but rather of those who make their bodies like this through luxuriousness, about those who are slim by nature" (*In Acta Apostolorum*, 60,256,26).

Joannes Philoponus (6th century A.D.)

Also known as *John Philoponus* or *John The Grammarian*, Joannes Philoponus was a Greek Christian philosopher, theologian and literary scholar who flourished in the 6th century A.D. A native of Alexandria in Egypt,

Philoponus became a student of the renowned Aristotelian commentator Ammonius Hermiae. In his teachings, Philoponus attempted to achieve a synthesis of Christian and classical Hellenistic thought, in an age dominated by the Church's suppression of 'pagan' philosophy and ideals. It is conjectured that Philoponus' Christianization of Aristotelian doctrine allowed the Alexandrian academy to continue despite disapproval from the Church. Seeking to defend the Christian dogma of personal immortality, Philoponus rejected the common Aristotelian and Stoic interpretation of a single universal mind existent in all people and taught that each person possesses an individual intellect. His critical interpretation of Aristotle resulted in several notable commentaries, including *De anima* ('On the Soul'), and *De generatione animalium* ('On the Generation of Animals'). *De opificio mundi* ('On the Creation of the World') is a commentary on Genesis, and is considered the most important of his theological works.

"And since the ears are attached to the passages in order to preserve the movement of the air from afar, and the seal lives in water, and in water there is no air, with good reason she does not have ears. And yet there was a need to have [ears] as a quadruped and viviparous" (*In libros de generatione animalium commentaria*, 14,3,225,5).

"Why, then, does God order to come forth from the waters not only swimming creatures, but also winged ones [*Cf.* Gen. 1,20 LXX]? For if certain ones of these have their livelihood upon the water, hunting their food there [...], but do not bear young underwater like the fish; but on the other hand, certain of the water-dwellers bear young on land: seals, crocodiles and crabs…" (*De opificio mundi*, page 211, line 2).

"3. What are the similarities and differences between water-dwellers and air-dwellers... Both races are oviparous, a few of those in the sea are viviparous, seals, dolphins, electric eels and others; and bats among the winged ones are viviparous. [...] And of the water-dwellers, seals, crabs, *pagouroi* [a kind of crab], crocodiles, hippopotami and frogs lead their lives on land; [...] and seals not only are viviparous on land, but also rear their offspring on land for a certain length of time, until these have matured and the mother leads them down to the dwellings and manner of life of the parents" (ibid., page 212, line 20+ 24+28).

Juvenal (A.D. 60–127)

Juvenal, living in the first century A.D., was a Latin satirist whose works present a scathing parody of the decadence of Roman society. In his third satire, Juvenal makes an acerbic attack on the incessant noise that plagued the poorer streets of Rome during the night (Green, 1974):

"How much sleep, I ask you, can one get in lodgings here?
Unbroken nights – and this is the root of the trouble –
Are a rich man's privilege. The wagons thundering past
Through those narrow twisting streets, the oaths of draymen
Caught in a traffic-jam – these alone would suffice
To jolt the doziest sea-cow of an Emperor into
Permanent wakefulness..." (*The Satires*, III, 238).

Lycophron (3rd century B.C.)

A Hellenistic poet, Lycophron was born around 320 B.C. on the island of Euboea. As a young man he travelled to Alexandria where he became one of the Pleid, a group of tragic poets. The only work of Lycophron's to survive is *Alexandra*, a dramatic monologue which relates the prophetic ravings of Cassandra, daughter of Priam, the ill-fated king of Troy:

"...the plashing rain of Zeus laid waste with deluge all the earth. And their towers were hurled to the ground, and the people set themselves to swim, seeing their final doom before their eyes. And on oat and acorn and the sweet grape browsed the whales and the dolphins and the seals that are fain of the beds of mortal men" (*Alexandra*, 77-85).

In a subsequent passage, Cassandra foretells the fate of Menelaus after the sacking of Troy:

"And he shall visit the fields [Egypt] which drink in summer and the stream of Asbystes [the Nile] and the couch on the ground where he shall sleep among evil-smelling beasts [seals]. And all shall he endure for the sake of the Aegyan bitch [Helen], her of the three husbands, who bare only female children" (ibid., 847-850).

Manilius (1st century A.D.)

Author of the earliest surviving treatise on astrology, *Astronomica*, a didactic poem in five books, Marcus Manilius lived during the reigns of Augustus and Tiberius in the first century A.D. Besides discussing celestial phenomena, the signs of the zodiac and the horoscopes of various Roman personalities, he writes with passion about his Stoic beliefs, and of the configuration of the stars that affected everyday pursuits. In so doing, he provides a rare account of the hunting of seals:

"On the left, as the last portion of the Fishes rises, appears the constellation of the Whale, pursuing Andromeda in heaven as on sea. This monster enlists its sons in an onslaught on the deep and a butchery of scaly creatures; theirs will be a passion for ensnaring the deep with nets spread wide and for straightening the sea with bonds; they will confine in spacious prisons seals which deem themselves as safe as in the open sea and shackle them fast in fetters; the unwary tunny they will draw along in a network of meshes" (*Astronomica*, 5.656-663).

Michael (11th century A.D.)

Two hundred years after the Byzantine patriarch Photius pursued his avid interest in Aristotelian logic, the 11th century marked a major revival of Aristotelian studies in Constantinople, exemplified by Michael of Ephesus. A professor of philosophy at Constantinople, Michael wrote commentaries on Aristotle's *Nicomachean Ethics* and also on other works by that philosopher, including *On the Parts of Animals*, and *On the Movement of Animals* (Tina Marshall *pers. comm.,* 1998).

"The seal is a quadruped, but because it has extremely short and finger-like feet, even as being incapacitated by this, it does not have ears" (*In libros de partibus animalium commentaria,* 46,25).

"He also says that the kidneys of all are hollow, some more, some less so, except for the seal; and he says that these are extremely solid and firm and do not have hollowness or a void of kindred body" (ibid., 63,33).

"Therefore, having established the difficulty of the question, he solves it in saying, 'Or one must posit all the race of hard-shelled creatures as a maimed and mutilated one, and that they move just like as if someone had cut off the legs of those furnished with feet.' For such creatures change places by rolling along, which occurs also in the case of the seal" (*In librum de animalium incessu commentarium*, 170,19).

Nonnus (5th century A.D.)

A Greek epic poet from Panopolis in Egypt, Nonnus was the author of *Dionysiaca*, a sprawling poetic tribute in 48 books to Dionysus, the god of wine, and his mythical conquest of India.

"Bring me the fennel, Mimallons! On my shoulders in place of the wonted kirtle, bind, I pray, tight over my breast a dapple-back fawnskin, full of the perfume of Maronian nectar; and let Homer and deep-sea Eidothea keep the rank skin of the seals for Menelaos" (*Dionysiaca*, I. 34-39).

In retelling the fable of the Giants' revolt against the Olympians because of Zeus' imprisonment of their brothers, the Titans, Nonnus writes of the massive storms created by Typhon:

"There was no room in the deep for all its phallanx of leviathans, since the Earthborn monster covered a whole sea, larger than the land, with flanks that no sea could cover. The seals bleated, the dolphins hid in the deep water... All the world was a-tremble" (ibid., I. 271-279).

"In both armies the sea-battle roared after the conflict on land, while Indian ships charged Bacchic ships with brineblustering yells. There was carnage on both sides, and the waves boiled with gore... The black water covered the black livid bodies of the swollen dead with seaweed in the depths; slimy mud covered coat of mail and seafaring wearer together; the sea was their grave. Many again had sepulture in the maw of seamonsters, or the darting seal entombed the inanimate corpse in her fishy throat and belched out a stream of brownish blood..." (ibid., XXXIX, 222-226; 237-243).

In a later passage, Dionysus speculates what gifts Poseidon the Earthshaker might bring to his wedding to Adonis' daughter, Beroë:

"What worthy gifts will Earthshaker bring? Will he choose his salt water for a bridegift, and lay sealskins breathing the filthy stink of the deep, as Poseidon's coverlets from the sea? Do not accept his sealskins" (ibid., XLII. 396-400).

Similar sentiments are expressed in a later passage:

"Go, tie up the hair of Proteus with ivy, something new for him! Let him leave the Egyptian water of the Pharian Sea, and change his sealskins for a speckled fawnskin, and bow his bold neck to me" (ibid., XLIII. 75-79).

In subsequent references to Proteus, Nonnus writes:

"Proteus left the flood of the Isthmian sea of Pallene, and armed him in a cuirass of the brine, the sealskin. Round him in a ring rushed the swarthy Indians at the summons of Bacchos, and crowds of the woolly-headed men embraced the shepherd of the seals in his various forms" (ibid., XLIII. 225-230).

"Flocks of sea-monsters ringed round the Old Man on his expedition to dry land, water splashed with a heavy roar from the open mouths of the sand-loving seals" (ibid., XLIII. 249-252).

Resuming his narration of the invasion, Nonnus continues:

"Glaucos assailed Dionysus, but Maron shot his thyrsus at him and shook him off. A cloudhigh elephant with earthshaking motions of his limbs stamped about his stiff legs with massive unbending knee, and attacked an earth-bedding seal with his long snout" (ibid., XLIII. 335-339).

Oppian of Cilicia (2nd century A.D.)

Hailing from Cilicia in south-east Asia Minor, Oppian was the author of *Halieutica*, a didactic poem in five books on the subject of fishing. The work was dedicated to a Roman emperor and his son, generally believed to have been Marcus Aurelius and Commodus.

"And Seals in the night-time always leave the sea, and often in the day-time they abide at their ease on the rocks and on the sands and take their sleep outside the sea" (Halieutica, I. 405).

"The mating of Dogs on land is similar to that of Turtles in the sea: similar also is that of Seals; for all of those remain a long time coupled rearwards, fast bound as by a chain" (ibid., I. 531).

"...those tribes that are covered with close-set scales or armed with scutes, are all alike oviparous; but from the fierce Dog-fish and the Eagle-ray and all the tribes that are called Selachians and from the kingly Dolphins which lord it among fishes and from the ox-eyed Seal spring children who straightaway from birth are like their parents..." (ibid., I. 643).

"Now all the viviparous denizens of the sea love and cherish their young but diviner than the Dolphin is nothing yet created... Yea and the seal also tends her young no less well; for she too has breasts, and in the breasts streams of milk. But not amid the waves but when she comes up on dry land is she delivered of the burden of her womb in seasonable travail. For twelve days in all she remains with her children there upon the dry land; but with the thirteenth dawn she takes in her arms her young cubs and goes down into the sea, glorying in her children and showing them, as it were, their fatherland. Even as a woman that has borne a child in an alien land comes gladly to her fatherland and to her own home; and all day long she carries her child in her arms and hugs him while she shows him the house, his mother's home, with sateless delight; and he, though he does not understand, gazes at each thing, the hall and the haunts of his parents; even so that wild thing of the sea brings her children to the water and shows them all the works of the deep" (ibid., I. 646; 685-702).

In Book V, Oppian goes on to describe the circuses and amphitheatres of ancient Rome, and of seals being pitted against bears in the arena:

"What valour burns in the heart of the Lion to be likened to that of the dread Hammer-head [shark]. Before the dread-eyed Seal the maned bears on the land tremble and, when they meet them in battle they are vanquished" (ibid., V. 35-40).

Yet Oppian concedes that despite the seal's formidable powers, there is a foe more deadly than even the monsters of the sea:

"But notwithstanding even for them the dauntless race of men has devised grievous woe, and they perish at the hands of fishermen..." (ibid., V. 41-43).

In a later passage, Oppian describes the hunting of seals, and the fishermen's relationship with the species:

"For the Seal no hooks are fashioned nor any three-pronged spear which could capture it: for exceeding hard is the hide which it has upon its limbs as a mighty hedge. But when the fishermen have unwittingly enclosed a seal among the fishes in their well-woven nets, then there is swift labour and haste to pull the nets ashore. For no nets, even if there are very many at hand, would stay the raging seal, but with its violence and sharp claws it will easily break them and rush away and prove a succour to the pent-up fishes but a great grief to the hearts of the fishermen. But if betimes they bring it near the land, there with trident and mighty clubs and stout spears they smite it on the temples and kill it: since destruction comes most swiftly upon seals when they are smitten on the head" (ibid., V. 376-391).

Oppian of Apamea (3rd century A.D.)

Although once attributed to Oppian of Cilicia, *Cynegetica*, a poem on hunting dedicated to emperor Caracalla, is now generally regarded as having been authored by a little-known poet of the same name from Apamea in Syria. Maternal love, writes Oppian, is not merely confined to humans…

"…who devise all things by their wits but even in creeping things and fish and the ravenous wild beasts themselves and the high-ranging flocks of birds: so much is nature mightier than all beside. What care doth the Dolphin amid the waves take evermore of its children, and the bright-eyed Glaucus and the Seal of evil smell!" (*Cynegetica*, III.109-115).

Orphica

In ancient Greece, many poems circulated under the name of Orpheus, the legendary bard and lyre player. Most of these, however, were authored by other, mostly anonymous, poets. The work *Orphica* is an epitome (a condensed prose rendition), assembled at the beginning of the fifteenth century, of the (pseudo-) Orphic poem on the magical properties of precious stones.

In the following passage, the apotropaic powers of coral are discussed. In the home, writes the poet, it keeps demons and phantoms and thunderbolts away…

"But it is also a security to sailors [and if ever you put it on board ship, dividing it onto what is called the masthead together with a seal skin it shall be the best safeguard] and it frees them from every danger and shipwreck [for it counteracts all kinds of winds, waves and confusions] and it is by nature the adversary of all deadly drugs and magic and purifies all defilements and spells and [acts] just as an antidote" (*De lapidibus epitome*, 150,1).

Ovid (43 B.C.–A.D. 17)

Although destined for a public career, Publius Ovidius Naso turned his attentions to poetry, and by A.D. 8 had become Rome's leading poet. Change and transformation is the central theme of Ovid's mythological epic *Metamorphoses*, in which he recounts legends ranging from the creation of the Earth and the great flood, to the death of Achilles and the apotheosis of Julius Caesar.

"All things were sea, a sea without shore.
Some gained the hilltops, others took to boats
And rowed where late they ploughed; some steered a course
Above the cornfields and the farmhouse roofs,
And some caught fishes in the lofty elms.
Perchance in the green meads an anchor dropped
And curving keels brushed through the rows of vines
And where but now the graceful goats had browsed
Gross clumsy seals hauled their ungainly bulk."
(*Metamorphoses*, I, 294-300 [Oxford University Press edition, 1986]).

In a later passage, Ovid describes the consequences as Phaeton – offspring of the sun – heats the earth to unbearable levels:

"…the wide seas
Shrink and where ocean lay a wilderness
Of dry sand spreads; new peaks and ranges rise,
Long covered by the deep, and multiply
The scattered islands of the Cyclades.
The fishes dive; the dolphins dare not leap
Their curving course through the air,
And lifeless seals float supine on the waves."
(ibid., II, 261-268 [Oxford University Press edition, 1986]).

Another myth recounted by Ovid surrounds the transformation of a river-god's grandson into a seal:

"Far off from here she [Medea] looks down on the Cephisus, bewailing the fate of his grandson changed by Apollo into a plump sea-calf..." (ibid., VII, 378-390 [Loeb Classical Library edition, 1977]).

Another reference to the seal is found in Ovid's *Heroides*, which relates the myth of Ariadne and the Minotaur-slayer Theseus. After being abandoned on the wild shores of the island of Naxos, she calls out to Theseus (Graves, 1955):

"Who knows but that this shore breeds, too, the tawny lion? Perchance, the island harbours the savage tiger as well. They say, too that the waters of the deep cast up the mighty seal!" (*Heroides*, 10.85-87).

Palladius (4th century A.D.)

Little is known about the life of Rutilius Taurus Palladius, who is thought to have flourished in the latter part of the fourth century A.D. The sole work attributed to him, a 14-book Latin treatise on agriculture entitled *De re rustica*, provides detailed descriptions of farming lore, ranging from the use of agricultural implements to the care and management of land and animals. Though frequently dismissed as a slavish copyist of earlier agricultural authorities (as were the compilers of the *Geoponica*) some scholars have noted that *De re rustica* contains many significant variations in farming procedures (White, 1970).

"It is believed that one can prevent hail by carrying the skin of a crocodile, hyena, or seal around one's property and hanging it up at the entrance of the farm house or yard when one sees that the calamity is imminent... it is said that, when this has been done, the hostile clouds [do nothing but] pass over the terrain which has been protected in this way" (*De re rustica*, 1.35.14).

"Some [farmers], seeing that a calamity [*i.e.* a hailstorm] threatens, hold a mirror up to the cloud, which, seeing its displeasing double, then turns away. Likewise, it is said that a seal hide thrown in the middle of a vineyard, over a single little grapevine, is sufficient to cover the whole vineyard [as if with a] protective mantle" (ibid., 1.35.15).

Paulus (*c.* A.D. 625– *c.* 690)

An Alexandrian physician and surgeon, Paulus was born on the Aegean island of Aegina. Regarded as the last prominent ancient Greek medical encyclopaedist, he compiled the *Epitomae medicae libri septem* ('Medical Compendium in Seven Books'), presenting a comprehensive account of the state of medical knowledge of his age. Although drawing extensively upon the works of such earlier Greek physicians as Galen and Aetius, his Compendium had a profound influence upon medical practice in the Arab world, whose physicians considered Paulus among the most authoritative of Greek medical writers.

"The cetacea, such as the whales, seals, balance-fish, dolphin, and great tunnies, have hard and indigestible flesh, containing thick juices. When pickled, they are more moderately so. And of the other fishes, those which are most humid and excrementitious are most fitted for pickling; but there is the same difference in pickles as in the fishes from which they are formed" (*Epitomae medicae libri septem*, 1.94.1.1).

In the following passage, Paulus recites a treatment to combat baldness and promote hair growth:[7]

"…Pound all these [ingredients] together, and sift through a small sieve. Then adding of bears' grease, 4 lbs., [and] of that of a seal the same quantity, pound and preserve in a leaden vessel. At the time of using add to any fragrant ointment" (ibid., 3.1.4.5).

Citing Dioscorides and Galen, Paulus also includes a reference to the medicinal efficacy of seal rennet in treating various ailments:[8]

"The rennet of a horse is described as proving serviceable in [bowel and dysentery] affections. That of a seal is said to have the properties of castor" (ibid., 7,3,16,167).

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[7] *Cf.* Galenus, *De compositione medicamentorum secundum locos*, libri x, 12,438,17.

[8] In his translation of Paulus, Adams (1844), comments (vol. 3, p. 314): "Our author's account of the medicinal properties of Rennet is taken from Dioscorides and Galen. Indeed he has copied the latter almost word for word." *Cf.* Dioscorides Pedanius, *De materia medica*, 2,75,2,7 *et seq.*; Galenus, *De simplicium medicamentorum temperamentis ac facultatibus* libri 12, 274, 17.

Pausanias (2nd century A.D.)

A physician from Greek Asia Minor, Pausanias devoted as many as twenty years to travelling through mainland Greece, recording his observations in a ten-volume *Description of Greece*.

"Except for their size and the shape of their feet, the sea tortoises are like land tortoises, but they have flippers like seals" (*Description of Greece*, I.44.12).

Philostratus the Athenian (3rd century A.D.)

Flavius Philostratus was a Greek sophist who studied in Athens and later lived in Rome. At the behest of Julia Domna, the second wife of Roman emperor Septimus Severus, he wrote *The Life of Apollonius of Tyana*, a wandering Pythagorean mystic and miracle worker of the first century A.D. The book was inspired by Julia Domna's wish to encourage a revival of traditional religious beliefs by offering a pagan narrative to compete against the Gospel life of Jesus. In the biography, Apollonius appears as a Christ-like figure in power and temperament, and in his ability to perform miracles. Despite suspicion that the work owed more to fiction than fact, the biography kindled religious fervour among the pagans of the Roman Empire, who erected shrines and other memorials to worship Apollonius.

"And if we look at creatures in the sea, we need not wonder at the dolphins loving their offspring, for they are superior creatures; but shall we not admire the whales and seals and the viviparous species? For I once saw a seal that was kept shut up at Aegae in the circus, and she mourned so deeply for her whelp, which had died after being born in confinement, that she refused food for three days together, although she is the most voracious of animals" (*The Life of Apollonius of Tyana*, II. 14, 54).

Philostratus the Elder (3rd century A.D.)

Philostratus the Elder, also known as Philostratus the Lemnian, was a Greek sophist and the grandfather of Philostratus the Athenian. In his work *Imagines*, Philostratus describes how a band of men set about hunting seagulls – "not, by Zeus, for their flesh, which is black and noisesome and unpalatable even to a hungry man" – but to supply doctors with the stomachs of the birds for their perceived medicinal properties. In the following passage, he observes how the sleepy gulls engage the help of a tern to protect them:

"The birds being drowsy are easily caught by torchlight, for the hunters flash a light upon them at night. But the gulls induce the tern with a part of the food they catch to act as a warden and to keep awake for them... If it senses the approach of any danger it raises a piercing shrill cry, and they rise at the signal and fly away, supporting their warden if ever it grows weary in flight... In that it stands in the midst of its birds, the tern is like Proteus among his seals, but it is superior to Proteus in that it does not sleep" (*Imagines*, II. 17, 11).

Photius (*c.* A.D. 810 – *c.* 893)

As patriarch of Byzantium, Photius compiled the *Bibliotheke* or 'library', also known as the *Myriobiblos* or 'vast compendium'. Composed of some 280 accounts of books he had read and studied, Photius was to become a key figure in the survival of ancient Greek texts, in an age that saw many manuscripts destroyed.

On the fate of Helen, whose abduction by Paris sparked the Trojan War, Photius writes:

"Some say that Helen, upon arriving among the Tauri of Scythia with Menelaus in search of Orestes [in Greek myth, the son of Agamemnon and Clytemnestra], was sacrificed, together with Menelaus, to Artemis by Iphigeneia [daughter of Agamemnon and Clytemnestra]; but others say that during the return voyage of the Greeks, Thetis [a Nereid], in the likeness of a seal, carried her off" (*Bibliotheca*, 190, 149b, 3 [Ptolémée Héphestion]).

Agatharchides of Cnidus, a geographer and historian of the 2nd century B.C. is regarded as the most significant Alexandrian writer of his age. Although his historical works have been lost, both Photius and Diodorus Siculus quote his geography, *On the Red Sea*, at length.

"The other fishes are (as we said) easily overcome. But whenever dogfish and the larger seals, and scorpions and moray-eels and all animals of such kind fall [into holes on the beach, after the tide has ebbed], struggling with them is dangerous" (ibid., 250, 449b, 9-13 [Agatharchides]).[9]

"He says that the neighbours of the thirstless fish-eaters [the *Ichthyophagi*], as if an inviolable treaty had been established between themselves and the seals, neither themselves plunder the seals, nor do they sustain any damage from them. Rather, each race [*i.e.* human and seal] leaves the fruit of the hunt to the one who has won it, without plotting against each other, and they live amongst each other in a way that people would scarcely be seen to live with [other] people" (ibid., 250, 450b, 12-19 [Agatharchides]).[10]

For Photius' record of the works of Theophrastus (Photius, 278, 528b, 6-15 [Theophrastus]), please refer to Theophrastus (*Fragmenta*, 175,1,7–16).

Phylotimos

See *Galenus* (*De alimentorum facultatibus* libri iii, 6,728,9).

Pliny the Elder (A.D. 23-79)

A Latin scholar and writer of natural history, Pliny the Elder was born in 23 A.D. at Como. His passion for science cost him his life at the age of 56, when poisonous fumes overwhelmed him during the eruption of Vesuvius in 79 A.D. His only surviving work is the 37-volume *Natural History*, an expansive compendium of contemporary scientific knowledge that was dedicated to his friend Vespasian Caesar (*i.e.* the ruling Emperor Vespasian's son, Titus). The work was completed in 77 A.D., two years before the author's death and the accession of Titus (Rackham, 1938).

"No living creature can be burnt by lightning without being killed. The temperature of the wound of those struck is lower than that of the rest of the body. Among things that grow in the ground, it does not strike a laurel bush. It never penetrates more than five feet into the earth; consequently when in fear of lightning men think caves of greater depth are the safest, or else a tent made of the skin of the creatures called sea-calves, because that alone among marine animals lightning does not strike..." (*Natural History*, II.146.5).

"The seal also resembles the beaver both in its amphibious habits and its nature. It gets rid of its gall, which is useful for many drugs, by vomiting it up, and also its rennet, a cure for epileptic attacks; it does this because it knows that it is hunted for the sake of these products" (ibid., VIII.111.1).

"Whales do not possess gills, nor do dolphins. These two genera breathe with a tube that passes to the lung, in the case of whales from the forehead and in the case of dolphins from the back. And sea-calves, called seals, breathe and sleep on land..." (ibid., IX.19.3).

"The aquatic animals have a variety of coverings. Some are covered with hide or hair, for instance seals and hippopotamoi…" (ibid., IX.40.2).

"The aquatic animals clad with hair are viviparous – for instance the saw-fish, the whale and the seal. The last bears its young on land; it produces after-birth like cattle; in coupling it clings together as dogs do; it sometimes gives birth to more than two in a litter; it rears its young at the breast; it does not lead them down into the sea before the twelfth day, thereafter continually accustoming them to it. Seals are with difficulty killed unless the head is shattered. Of themselves they make a noise like lowing, whence their names 'sea-calves'; yet they are capable of training, and can be taught to salute the public with their voice and at the same time with bowing, and when called by name to reply with a harsh roar. No animal sleeps more heavily. The fins that they use in the sea also serve them on land as feet to crawl with. Their hides even when flayed from the body are said to retain a sense of the tides, and always to bristle when the tide is going out; and it is also said that the right fin possesses soporific influence, and when placed under the head attracts sleep" (ibid., IX.41.2).

"But no creature harmful to fish enters the Black Sea besides seals and small dolphins" (ibid., IX.50.2).

"In a discussion of mental faculties it must not be omitted that among birds, swallows and among land animals mice, are unteachable, whereas elephants execute orders and lions are yoked to chariots, and in the sea seals and ever so many kinds of fish can be tamed" (ibid., X.128.4).

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[9] *Cf.* Diodorus Siculus, III. 15. 6.

[10] *Cf.* Diodorus Siculus, III. 18. 7.

"With the solid hoofed species in the quadruped class the males are excited by scenting the female, also dogs, seals and wolves turn away in the middle of their coupling and still remain coupled against their will" (ibid., X.173.7).

"...but all species, at all events viviparous ones, have some ears, except the seal and dolphin, and those we have designated cartilaginous, and vipers: these have only holes in place of ears, except the cartilaginous species and the dolphin, although the latter is obviously able to hear; for dolphins are charmed even by music, and are caught while bewildered by sound" (ibid., XI.136.7).

"The eyes of night-roaming animals like cats shine and flash in the dark so that one cannot look at them, and those of the wild-goat and the wolf gleam and shoot out light; the eyes of the sea-calf and of the hyena change frequently into a thousand colours..." (ibid., XI.151.3).

"Not all species have tongues on the same plan... with lizards it is cleft in two and hairy, and with seals also it is double…" (ibid., XI.171.3).

"As has been said, few aquatic species possess lungs, and in the oviparous species they are small and contain froth not blood; consequently these species do not experience thirst. The same cause makes it possible for frogs and seals to stay long under water" (ibid., XI.188.6).

"All viviparous quadrupeds have kidneys... In all cases the right kidney is higher, and not so fat, and drier; but with both the fat is discharged out of the middle, except in the seal" (ibid., XI.206).

"The gristly aquatic species have marrow in the spine, and seals have gristle, not bones" (ibid., XI.215-216).

"...the dolphin is the only animal that gives suck while in motion. But whales and seals also suckle their young" (ibid., XI.235.4).

"For the treatment of quinsy argemonia is taken in wine, hyssop is boiled with figs and used as a gargle, peucedanum is used with rennet of the seal in equal parts, and proserpinaca pounded with sprats-brine and oil, or else held beneath the tongue" (ibid., XXVI.23.3).

"Epilepsy is cured by the root of the panaces I have called heraclion taken in drink with seal's rennet; three quarters of the mixture must be panaces... Other cures are... equal quantities of peucedanum and seal's rennet taken in drink" (ibid., XXVI.113.2-XXVI.114.5).

"The Magi go on to recommend, so cunning are the evasions of the fraudulent charlatans, that... gout [is relieved] by the ash of the [hyena's] spine, with the tongue and right foot of a seal added to bull's gall, all being boiled together and applied on hyena skin" (ibid., XXVIII.94-96).

"When the bite of a mad dog causes a dread of drink they rub the face with the fat of a seal, with more effect if there are mixed with it the marrow of a hyaena, mastic oil and wax" (ibid., XXXII.57).

"Lichens [ringworm] and leprous sores are removed by the fat of the seal..." (ibid., XXXII.83).

"They recommend too a gouty foot to be rubbed with a fresh sea-hare, and the patient also to be shod with beaver skin, by preference that of the Pontic beaver, or else with seal skin, seal fat also being good for gout" (ibid., XXXII.110).

"Epilepsy, as I have said, is treated by doses of seals' rennet with mares' or asses' milk, or with pomegranate juice... Some too swallow the rennet by itself, made up into pills" (ibid., XXXII.112).

"The Magi also teach that crabs' eyes, tied on with the flesh of a nightingale in deer skin, drive away sleep and cause watchfulness. For those sinking into lethargus they prescribe that the patient smell the rennet of the whale or that of the seal" (ibid., XXXII.116).

"Patients with tetanus are relieved by an obolus[11] by weight of seal's rennet taken in wine..." (ibid., XXXII.120).

"The fat of the seal melted in the fire is inserted into the nostrils of women swooning from hysterical suffocation, or else seal's rennet used as a pessary in a piece of fleece" (ibid., XXXII.130).

"On the other hand, upon my solemn word, in the sea, vast though it is, and in the ocean, the number of animals produced is known; and – we may well wonder at this – we are better acquainted with the things which nature has sunk down in the deep... To begin with larger beasts, there are... whales... dolphins, and seals well known to Homer..." (ibid., XXXII.143-144).

Plutarch (*c.* A.D. 46-120)

A prolific Greek biographer, historian and moral philosopher, Plutarch was born at Chaeronea near Thebes. Although spending much of his life in his home town, he also travelled to Asia, Egypt, and Italy, and during the

[11] Under the Roman system of weights, an *obolus* is a subdivision of the uncia (27.29 grams), and is equivalent to 0.568 grams.

last 30 years of his life was a priest at Delphi, becoming a key figure in the revival of the shrine. Of over 200 books written by Plutarch, approximately half still survive, including those which compose *Moralia*, covering a wide range of philosophical, religious, and antiquarian issues.

"Besides, lagoons and rivers are devoid of sea monsters, so that the [fish] eggs and fry may survive. This is the reason why the Black Sea is most favoured for spawning by very many fish. It breeds no large sea beasts at all except an infrequent seal and a small dolphin..." (*Moralia, The Cleverness of Animals*, 981 C).

"Furthermore, seals too bear their young on dry land and little by little induce their offspring to try the sea, then quickly take them out again. This they do often at intervals until the young are conditioned in this way to feel confidence and enjoy life in the sea" (ibid., 982 D).

"But, dear Poseidon! What an absurd and ridiculous error I have almost fallen into: while I am spending my time on seals and frogs, I have neglected and omitted the wisest of sea creatures, the most beloved of the gods! [the halcyon or kingfisher]" (ibid., 982 E-F).

"...the gall of the hyena and the rennet of the seal – animals unclean in all else – have a certain efficacy in disease..." (*Moralia, The Divine Vengeance*, 552 F).

"At dinner in Elis, Agemachus served us some giant truffles. Everyone present expressed admiration, and one of the guests said with a smile, 'They certainly are worthy of the thunder that we've had lately,' obviously laughing at those who say that truffles are produced by thunder... It is as if someone were to imagine that rain not merely brings out snails where we can see them, but actually creates them. Agemachus, however, upheld the popular theory, and advised us not to regard the miraculous as unworthy of belief. For indeed many other marvellous effects are, he said, produced by thunder, lightning and other meteoric phenomena, though the causes of these effects are difficult or completely impossible to discover. 'For instance, the much-ridiculed, proverbial tassel-hyacinth here is protected against the thunderbolt not by its smallness but by a resistant property in it, like the fig tree, the seal-skin, they say, and the pelt of the hyena, which ship-owners use to cover the mastheads' " (*Moralia, Table-Talk*, 664 B, C).

"If, as they say, a fig is never struck by lightning, this too could be attributed to the bitterness and poorness of its trunk. For it is held that lightning never strikes objects of that description, just as it never strikes sealskins or hyena pelts" (ibid., 684 C).

"I had frequently asked my friends to excuse me, not least because Theophrastus fights shy of the question, in a book that collects and discusses many phenomena whose causes we cannot discover, such as the hen's covering herself with chaff when she has laid an egg, the seal's swallowing its rennet when captured, the stag's burying its cast horns, and the sea-holly (if one goat takes a bit of this in its mouth, the whole herd comes to a stop)" (ibid., 700 C, D).

Praxagoras of Kos (4th century B.C.)

See *Caelius Aurelianus*.

Pseudo-Callisthenes (4th century A.D.)

The *Historia Alexandri Magni*, a romantic account of the exploratory adventures and conquests of Alexander the Great, was composed in Greek, probably in the 4th century A.D. Although once falsely ascribed to the Greek historian Callisthenes, a relation of Aristotle, the *Alexander Romance* is now generally considered to be the work of an anonymous poet living some 600 years later.

Alexander, the reader is told, has travelled from beyond the Taurus mountains, towards the Gulf of Issus and through Armenia (*i.e.* Turkey), and is determined to reach the other side of the Median desert. By the following passage, however, geography is abandoned as Alexander and his men encounter dangerous, uncharted territory populated by headless men, five-footed beasts and other monsters (Tina Marshall *pers. comm*., 1996):

"Moving on, we came to a place where there were headless men. They had no heads at all, but had their eyes and their mouths on their chests, and they talked with their tongues like men. They were hairy and dressed in skins, a fish-eating sea people. And they gathered there, on land and from the sea, hydna [truffles], which we have at home. They got twenty-five litres worth and gave them to us. And we saw many huge sea lions [seals] slithering on the ground. And we saw, too, lobsters as big as ships" (*Historia Alexandri Magni*, 2.37.14).

Pseudo-Galenus

The term *Pseudo-Galenus* refers to a collection of works that were once falsely attributed to Galen, either through error or deliberate deceit. Indeed, the desire to lend credibility to a medical work, and hence to ensure its survival, resulted in many spurious medical works being handed down in manuscripts bearing Galen's name, both in antiquity and in later centuries. For the most part, the genuine authors of such manuscripts remain anonymous. The following two extracts appear in the *Lexeis Botanon*, a botanical dictionary. Plants, listed alphabetically, are given brief identifications, most often simply in the form of an alternate name. Thus, a synonym for 'bastard sponge' (*halcuonion*) appears as 'excrement of seal' (Tina Marshall *pers. comm.,* 1996).

"That called amarantus or 'ever-living'. Akalephe [stinging-nettle] or that called the nettle. Bastard sponge or 'excrement of seal'. 'Flower of anthemis' or camomile" (*Lexeis Botanon* 387,2).

"…seaweed or moss of the sea. Of Indian leaf or of leaves of Cinnamomum Tamala. Spider-wort or eggs of arachne. Seal or animal of the sea. Wild spikenard or aromatic class" (ibid., 392,22).

Also part of the *Pseudo-Galenus* collection is *De remediis parabilibus*, offering remedies and treatments for various illnesses:

"For gout in the feet… Skin of seal, or of lion or of wolf or of fox, if one works it and wears it as sandals, will not hurt the feet" (*De remediis parabilibus libri* iii, 14,566,16).

Serapion (2nd century A.D.)

See *Caelius Aurelianus*.

Silius Italicus (*c.* A.D. 26 – *c.* 101)

A wealthy and successful advocate, Silius Italicus became a prominent figure in Rome's political and cultural elite. He was appointed consul in A.D. 68, and approximately a decade later, governor of Asia. Upon his retirement, he returned to his estates near Naples to pursue his cultural interests and poetic aspirations. A devout admirer of the Latin poets Cicero and Virgil, he composed *Punica*, an epic poem in seventeen books on the Second Punic War (218–201 B.C.).

"Another lyre calmed the stormy sea with its music and arrested the seals; it drew after it Proteus in all his changes of shape, and carried Arion on the sea beast's back" (*Punica*, 11.446-448).

Soranus of Ephesus (2nd century A.D.)

See *Caelius Aurelianus*.

Stephanus of Byzantium (6th century A.D.)

A Byzantine grammarian, Stephanus was a Christian, and active at the university of Constantinople. He is most remembered for his geographical lexicon, the *Ethnica*, which he dedicated to Byzantine emperor Justinianus I (*c.* 530 A.D.). Predominantly orthographical and philological in nature, *Ethnica* was originally composed of over fifty volumes, but survives only in epitome form. In the following passage, Stephanus comments on the founding and naming of the city of Phocaea (modern-day Foça on Turkey's Aegean coast):

"'Phokaie' [formed] through the 'e'. And it was named on account of the fact that many seals followed the founders. The citizen [is called] 'Phokaeus' and 'Phokaieus' and 'Phokaites' and the feminine 'Phokais'. There is another city of the same name near Mycale in Karia. The adjectival name of its people is the same" (*Ethnica*, 675,21).

Strabo (*c.* 63 B.C.–A.D. 24)

An Asiatic Greek from Pontus, Strabo became an ardent traveller, his expeditions taking him "from Armenia to Etruria, from the Black Sea to the borders of Ethiopia". His most important work, *Geography*, in seventeen books, provided detailed geographical, historical, economic and cultural knowledge of countries as far afield as Spain and India.

In Book 16, Strabo turns his attention to the Red Sea, and records the existence of Phocae or 'Seal Island' (yet at a different location than the island of the same name cited by Diodorus Siculus).[12]

"Some of the islands, three of them, follow in succession: Tortoise Island, Seal Island, and Hawk Island, as it is called; and the whole of the coast has palm-trees, olive groves, and laurel groves, not only the part inside the straits, but also most of the part outside" (*Geography*, 16.4.14).

Speaking of the Caspian Sea and the Araxes river delta, Strabo observes:

"But the country is inundated most of all, they say, by the Araxes River, which splits into numerous branches and empties by its other mouths into the other sea [Northern Ocean]... Those who live in the marshes eat fish, and clothe themselves in the skins of the seals that run up thither from the sea" (ibid., 11.8.6-7).

Suetonius (*c.* A.D. 69–*c.*122)

Though writing on a wide range of subjects, from *Roman Manners and Customs* to the *Lives of Famous Whores*, the Roman biographer and historian Gaius Suetonius Tranquillus is best known for his work *The Twelve Caesars*. Ranging from Julius Caesar to Domitian, the biographies provide an account of the ancestry and career of each emperor, and also an insight into the numerous scandals that haunted the domestic lives of the Caesars.

"As for Augustus's superstitions: he is recorded to have been scared of thunder and lightning, against which he always carried a piece of seal-skin as an amulet, and to have taken refuge in an underground vault whenever a heavy storm threatened – because, as I have already mentioned, he had once narrowly escaped being struck on a night march" (*The Twelve Caesars*, II. 90).

Theocritus (*c.* 300-260 B.C.)

A native of Syracuse in Sicily, the Hellenistic Greek poet Theocritus first settled on Kos and then in Alexandria. His surviving poems, generically known as *Idylls*, cover mythological and pastoral (bucolic) themes, and were later, in the first century A.D., destined to have a strong influence upon Virgil in the *Eclogues*.

"Go, stump-horn, and say, 'Milon, Proteus herded seals for all that he was a god' " (Idylls, Idyll VIII, 51-52).

Theophilus Protospatharius (9th century A.D.)

A medical writer and a contemporary of Photius, Theophilus held a respected position at the Byzantine court. It is speculated that in later life he became a monk. His major work, focusing on anatomy, consists of five books based on Galen and Hippocrates. Among his lesser works is a commentary on the aphorisms of Hippocrates, whom he called "the Prometheus of the healing art".

"The word 'life' is used in many ways. For 'life' is said in reference to the place [where life is conducted], in so far as we say that it is possible for the amphibian animals 'to live' both on dry land and on water, like the seals" (*Commentarii in Hippocratis aphorismos*, 2, 246, 14).

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[12] *Cf.* Diodorus, *Library of History*, Book III, 42.1-5.

Theophrastus (*c*. 371-287 B.C.)

Theophrastus was born at Eresus on the island of Lesbos around 370 B.C. In Athens, he became a follower of Aristotle who bequeathed him his library and manuscripts and appointed him his successor at the Lyceum. His *Enquiry into Plants* and *On the Causes of Plants* is regarded as the foremost botanical work of antiquity (Hort, 1916).

Describing the medicinal properties of a certain species of plant, Theophrastus states that:

"The kind named after Herakles has a large broad leaf, three spans each way, a root as thick as a man's finger, forking in two or three; in taste it is somewhat bitter, in smell like pure frankincense; it is good to drink it against epilepsy, mixed with the rennet of a seal in the proportion of one to four..." (*Enquiry into Plants*, IX. xi. 3).

"Therefore, if it is able to do this [sc. a fish leaving the water to go to sleep], it is clearly an intermediate species, not [doing this] for food or by way of life, as in the case of the seal, the fresh-water tortoise, and certain others, and many of the birds too, but also for taking in both the air and the sea, not, in this way, like the dolphin and certain others, being by nature breathers which take in the sea and blow it out by necessity, but both for the maintaining of life. Unusual would be their nature and their ability" (*Fragmenta*, 171,1,9).

"The spotted lizard, they say, begrudging humans its helpful service, swallows down its skin after shedding it, because it is a remedy for the epileptic. And the stag buries its right horn, as it is effective against the poison of the toad... And that the seal, whenever it is about to be captured, vomits its rennet, which is also useful to epileptics... But animals don't do these things because of a grudge; rather, humans, from their own characteristic way of seeing things, have ascribed to them this motivation – that is altogether clear. For from whence could irrational creatures have such great knowledge, which even rational beings acquire [only] with much practice? Rather, the seal is troubled and vomits its first milk probably through fear, and the spotted lizard swallows down its skin by virtue of an inclination that is natural to it..." (ibid., 175,1,7–16, as recorded by Photius, 278, 528b, 6-15 [Theophrastus]).

Valerius Flaccus (*c*. A.D. 40-92)

Little is known of the life of Latin poet Gaius Valerius Flaccus. His only known work is the epic poem *Argonautica*, largely inspired by the Hellenistic poem of the same name by Apollonius of Rhodes. Valerius Flaccus' *Argonautica* was left unfinished at the time of his death, its narrative breaking off abruptly in the eighth book.

"Then too Polyxo, the priestess beloved of Phoebus (of uncertain race and country, she declares that thou, o mighty Tethys and the ever changing Proteus steered their course thither from the Pharian caves, drawn by a team of seals across the water…)" (*Argonautica*, 2.316-19).

The following passage, reminiscent of Homer's description of the sea-god Proteus in the *Odyssey*, forms part of an elaborate poetic description of nightfall. Symbolising this hour is the sea deity Phorcys (son of Gaia and Pontus), calling in his seals to his cave-dwelling for the night. Conceivably, the seals are described as "shell-encrusted" because of the long time they spend in the sea (Grimal, 1990; Tina Marshall *pers. comm.,* 1998).

"Meanwhile from far away old Phorcys gives a signal over all the deep and making for his cave gathers his huge shell-encrusted seals together…" (ibid., 3.726-8).

In the following extract, 'The Odrysian chant' refers to the song of Orpheus, whose legendary musical skills proved so powerful that they defeated even the bewitching song of the Sirens during the voyage of the Argonauts. Here, seals (rather than dolphins, the species normally associated with this myth) accompany the Argo on its adventures, enraptured by Orpheus' music (Wijsman, 1996).

"The seals delight in the Odrysian chant…" (*Argonautica*, 5.439).

Virgil (70–19 B.C.)

Though apparently destined for a senatorial career, Publius Vergilius Maro abandoned public life and turned instead to poetry and philosophy. Three of his works survive, the *Eclogues*, inspired by the *Idylls* of Theocritus, the *Georgics*, a celebration of Italian country life and values, and the epic poem the *Aeneid*.

"Now the deepwater tribes, yes, all the swimming creatures
Lie on the shore's edge, washed by the waves like shipwrecked bodies
And seals take refuge in rivers they never swam before…" (*Georgics*, III.541-3).

"Sea-blue Proteus, one who drives through the mighty deep
His chariot drawn by harnessed fish and two-legged horses...
Him we nymphs and ancient Nereus hold
In honour, for he knows all
That is, that has been, and all that is about to be –
Knows all by the god Neptune's grace, whose herds of monsters
And hideous seals he pastures in meadows submarine..." (ibid., IV.388-396).

"Now Proteus came to his customed
Den from the water: around him the dripping bodies of the deep
Frolicked, flinging the bitter spray far and wide about them.
All over the beach the seals were sprawled for their siesta."
(ibid., IV.432 [Oxford University Press edition, 1983]).[13]

Xenophanes (*c.* 570–*c.* 478 B.C.)

See *Hippolytus*

Fragments of Unknown Origin

The keyword search described in the Methods section of this paper also yielded the following Latin fragments of unknown origin:

"Father Mars, this saucer, who do we also deny to be able? Not the foul seal, not the withering whales…" ('SerAet').

"Angry, he called upon father Aegeus, in order that he could attack the seal with Hippolytus driving the chariot…" ('A.6.445.5').

"A large head is ugly, just as 'he fed on the ugly seals beneath the whirlpool.' A very long neck, just as "when the great nut tree dressed his grove in flower" ('G 3.52.2').

"And he showed the two, the deer to stray with the dog, and the master overloaded with fear, and that one with courage. They flee into the rivers of seals as if fearing the plague of the sea" ('G 3.543.1').

[13] Rendered as "The seals lay down to sleep, here and there along the shore…" in the Loeb Classical Library edition, 1967.

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