

STATISTICAL ANALYSIS OF THE MINE NAMES IN ANCIENT LAURION

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SUMMARY

The purpose of this article is to shed light on the subject of the names, given to mines in ancient Laurion. A general tendency was investors to give names to their mines mainly in favor of a deity or a hero, not essentially connected to local cults. This is testified by the inscriptions of mining leases, in the Athenian Agora, as well as by the property marking inscriptions from the industrial area of ancient Laurion.

A presentation of statistical data and analysis of names is attempted, after their having been divided to categories, according to their origin and connotation. Moreover, the article deals with the question of the role of those names and the criteria for the investors' choosing them for their mines.

Key words: Laurion, mine leases, names, ancient Greek religion, production, divination.

The Laurion mines had been the primary source of ancient Athens for silver and lead. For the significance of metal production to the Athenian economy, according to the mining law (μεταλλικός νόμος), all deposits were regarded as public property. This meant that the state leased the possibly metalliferous areas or abandoned mines to wealthy investors, for a fixed period of time [1, 2, 3, 4 and 5].

On behalf of the state, a council of officials called Poletai (Πωληταί) had the responsibility of managing the leases of the Laurion mining areas. Their decisions were published in marble inscriptions in the Athenian Agora, by the 1st century B.C. [1, 6]. This is true, although silver production in Laurion begun much earlier and the mines had fallen into decline after four centuries [7]. It is obvious that the preserved leases cover only a short period of the history of the Laurion mines. This observation leads to the hypothesis that older and earlier leases were written on a material less durable than marble. However, the intense mining activity, during the 4th century B.C., created probably the need of those texts being published in the Athenian Agora, on a material as hard as marble. In this way, every citizen had access not only to the

lessees of each year, but also their prices, boundaries, names and the status of mining activity in the them, as in the following example (P26: 285-290)*:

Τιμοκλείδης Ὑψηχίδου Φρεά: ἀπεγράψατο [μεταλλ]-
ον ἀνασάξιμον παλαιὸν στήλην ἔχον Ποσει[δωνια]-
κὸν Ἀναλφυστοῖ: ὧι γε: βορρ: μέταλλον Ἀρτε[μισιακ]-
ὸν νοτόθ: μέταλλον Ἡρωικὸν πρὸς ἡλίου ἀνι[όν: ἐδά]-
φη Νεοπτολέμου δυομέ: χαράδρα ὄν[η: Τι]μοκ[λειδης]
Ὑψηχίδου Φρε: ΔΔ:

TRANSLATION 1 Timokleidis, son of Hypsichidis, from the deme of Phrearrhioi registered an old re-exploitable mine, having a stele, named Poseidoniakon in Analphystos, north of which lies the mine called Astemisiakon, in the south the mine called Heroikon, in the east the property of Neoptolemos, in the west there is a gorge; Timokleidis' purchase, son of Hypsichidis, from the deme of Phrearrhioi, price: 20 drachmas.

METAΦΡΑΣΗ 1 Ο Τιμοκλείδης, γιος του Ὑψηχίδη από τον δήμο των Φρεαρρῶν δήλωσε παλαιὸ μεταλλεῖο πιθανῶς εκμεταλλεύσιμο (ανασάξιμο), με στήλη, ονομαζόμενο Ποσειδωνιακὸ, στην Ἀνάλφυστο, το οποίο συνορεύει: βορείως με το μεταλλεῖο Ἀρτεμισιακόν, νοτίως με το μεταλλεῖο Ἡρωικόν, ανατολικά με την ἔκταση του Νεοπτολέμου και δυτικά με χαράδρα. Αγορά του Τιμοκλείδη, γιου του Ὑψηχίδη του Φρεαρρῶν. 20 Δραχμῆς.

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The above text contains the names of three mines, Poseidoniakon, Astemisiakon and Heroikon, the first belonging to Timokleides and the others being adjacent to it. It would be stressed that those names never correspond to ore processing plants but only to mines, spread all over the industrial area of ancient Laurion.

The property marking inscriptions (horoi), found there, declared, except for ore processing workshops and furnaces, the positions and the names of the leased mines [8]. In Poletai inscriptions (published by the homonymous officials), the existence of a property marker in a mine was probably described by the phrase στήλην ἔχον (having a stele). The preserved horoi of mines date also to the 4th century B.C. and they eventually refer to a number of names in common with the Poletai records. Their texts appear a standard format: identity of the lessee, action and the name of mine, as below [3]:

Σίμος κατέλαβε Ἀσκαληπιακόν.

TRANSLATION 2 Simos possessed (hired) the mine called Askalipiakon.

ΜΕΤΑΦΡΑΣΗ 2 Ο Σίμος κατέλαβε (μίσθωσε) το μεταλλείο Ἀσκαληπιακόν.

The two categories of inscriptions mentioned above constitute the only sources for the names given to the mines of Laurion. Poletai inscriptions contain the total number of names of mines, hired between 367 and 299 B.C., excluding the already working ones. From the former, the 133 records of 34 different mine names are still legible, while the illegible records are only few.

More precisely, in Poletai, a practical classification of mine names can be provided, based on whom they correspond to. Gods, deities or heroes, meaning religious figures, which could be worshiped, fall into the first category. It should be noted that this category concentrates some of the eponymous heroes of the Attic demes, such as Aigilos (Aigiliakon), Kephalos (Kephalaiakon) or Simachos (Simacheion) [9]. Names of citizens fall into a second category. The above chart shows the frequency of the use of each mine name, according to Poletai inscriptions.

Two main conclusions can be drawn from the above chart. Firstly, it shows a great deal of variety of names. The vast majority of them (86%) belong mainly to gods or to heroes. Moreover, among gods, Artemis seems to be so popular, as to have given her name almost to the one fourth of the local mines.

The study of horoi inscriptions of the mines bears out the same observations, about the two categories

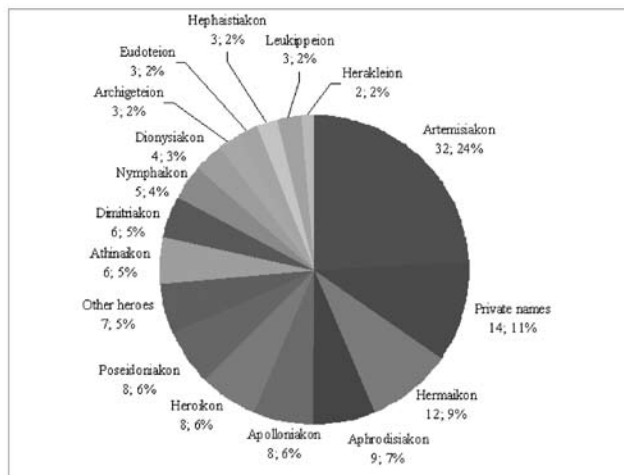


CHART 1 The names of Laurion mines according to Poletai inscriptions.

ΔΙΑΓΡΑΜΜΑ 1 Τα ονόματα των μεταλλείων του Λαυριού, σύμφωνα με τις επιγραφές των Πολητών.

of names and the popularity of Artemis. This corpus of inscriptions contains 14 references to 10 different names, as in the chart, below:

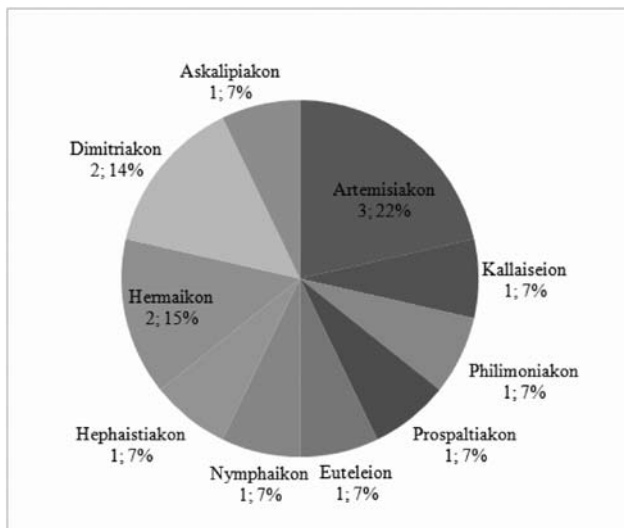


CHART 2 The names of Laurion mines from horoi.

ΔΙΑΓΡΑΜΜΑ 2 Τα ονόματα των μεταλλείων του Λαυριού από τους όρους.

Despite the fact that the epigraphical testimonies offer rich and reliable data, concerning the discussed subject, the exact location of the bulk of the mines is still uncertain. It is only known, from Poletai, that common names, such as Apolloniakon, Artemisiakon or Hermaikon, are spread all over the area of Laurion [6]. The same applies to the horoi of Artemisiakon mines, which were found in several places [8]. From the above, one may reach to the conclusion that it is

not likely names in Poletai inscriptions, of different years, be in duplicate, referring to the same lease twice. Legible descriptions of locations of homonymous mines indicate that they were established not in the same areas.

In addition, one could logically assume that a concession, since the early stage of mineral exploration until the organization of a systematic production or its abandonment, retained the same name. Otherwise, authorities would not have succeeded in keeping consistent catalogues of leases, which were indispensable not only for the Athenian state but also for any investor. Names of gods or heroes were ideal, in this case, because nobody would dare change them, as a matter of religious values.

However, those names are divided into two types, depending on their suffixes. The most common type includes names ending in *-ikon* or *-iakon*, meaning “property of somebody”, such as *Artemisiakon* (property of Artemis). The second type consists of names having the suffix *-ion* or *-eion*, indicating dedication to someone, as for example, *Leukippeion* is dedicated to *Leukippos*. The difference in meaning between the two suffixes, *-ikon* and *-ion*, is more noticeable, in case of the derivatives of the name of *Hermes* (Ἑρμης). The adjective Ἑρμαϊκός characterizes somebody or something that belongs to *Hermes*, whereas Ἑρμαῖος is either related or dedicated to *Hermes* [1, 10].

Names of gods are always accompanied by the suffix of the first type and the ones of heroes and ordinary people are of both types. The following chart shows the names of the second type, in total, and their proportion to the first type, based on the data from both, *Poletai* records and *horoi*.

Given the above linguistic and statistical data, one can identify a whole tradition of name-giving to the *Laurion* mines. This tradition goes back to a period of time before 367 B.C., when the first inscription of *Poletai* (P5) was issued. In its text there are a lot of references to abandoned, old mines, which already had been given a name (P5: 40-83). Most of them must have been exploited before the occupation of *Dekeleia* by the Spartans, in 413 B.C., during the *Peloponnesian War*. At that time, amongst scores of other slaves, the ones of *Laurion* defected to the Spartans (Thucydides 7.27.5.1-4) [7]. This fact resulted in the abandonment of the local mining area. It is not clear how soon the recovery took place in the 4th century B.C. However, in *Poletai*, the only references to new exploitations (καινοτομία) appear not earlier than 330 B.C. (P34: 5-6, P41: 3, P44: 8, P51: 5) [5, 11].

As for the mine owners, it is clear that they sought divine protection for their investments, either practically or theoretically. In other words, the names given to mines did not serve only the purpose of distinguishing different leases. If this was the only reason, there

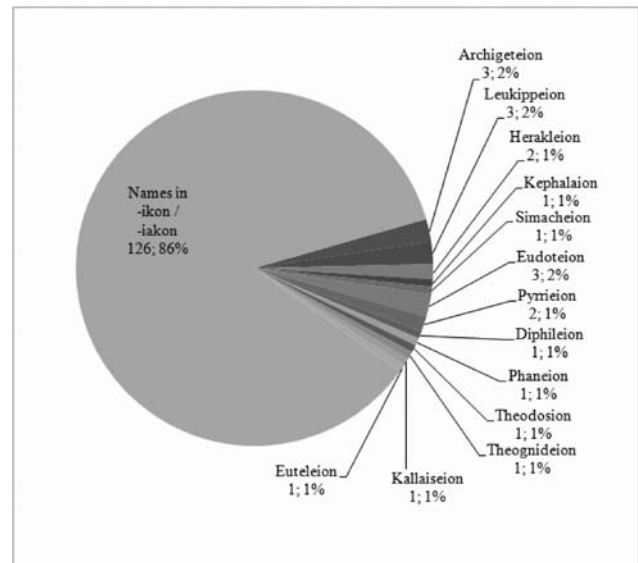


CHART 3 Classification of mine name of *Laurion* based on their suffixes, from *Poletai corpus* and *horoi*.

ΔΙΑΓΡΑΜΜΑ 3 Ταξινόμηση των ονομάτων των μεταλλείων του Λαυρίου βάσει των κατάληξεών τους, από το corpus των Πωλητών και τους όρους.

would be no need for divine (including heroes’) names but just for private ones. The popularity of the first ones, which numbered 72% on average, in the *Poletai* and in *horoi*, suggests that religion influenced mine owners.

The statistical analysis shows that, initially, the mining leases of *Laurion* were given names of gods or heroes. These formed the great majority even during the 4th century B.C. and they implied, by ending in *-ikon* or *-iakon*, that a lease was symbolically a possession of its namesake god or hero. Despite that, under no circumstances they can be regarded as sacred lands. According to the mining law of Athens, ore deposits belonged to the state, which had the responsibility of leasing them to investors.

Private names would have adopted, at the beginning, the suffix *-ion* / *-eion*, showing probably the person who first discovered the deposit and opened the mine. Although only divine names acquired always the same suffix; the ones of heroes and people have no standard ending, in the 4th century. This difference is characteristic of how important divine protection was to mining activities. In contrast, for heroes, who were not so high in the religious hierarchy, a simple symbolic dedication of a mine, through the ending *-ion* / *-eion*, was enough. Concerning the private names, the suffix *-ikon* / *-iakon* may be attributed to analogy to the ones of the god names or it has the meaning of an actual possession.

The question that eventually comes up is related to the need which motivated the mine owners to

dedicate their leases to a hero or to put them under the possession of a deity, even in a symbolic manner. The answer could be no other than the encouragement that religion can always offer to people who deal with dangerous mining activities, on a daily basis. If they guaranteed the protection of a god or a hero, then they would feel more secure to carry on with their work. On the contrary, ore processing plants, which involved no dangerous tasks, lacked names, as it is proven by the study of horoi [8].

It is true that accidents were a real threat for the lives of mine-workers. They might face inadequate drainage, weak roof support, poor ventilation and illumination or even sulfur emissions [5, 7, 12 and 13]. All these problems could result sometimes in collapse of a gallery or to deaths caused by asphyxia. Such accidents would have also serious economic effects on investors, as exploitation had to be paused. In addition, mining involved more economic risks for them.

The functional cost of an average mine in Laurion is estimated approximately to six talents, when the profits were about four talents per year, according to Professor Conophagos' calculation. They could be even more, depending on the quantities of lead that was extracted and sold. On the other hand, the exploitation of the ore might prove to be unprofitable, due to low metal concentration. Both factors, safe work and the quality of the exploited ore, were decisive for an investor's great wealth or they could spell a financial disaster [3].

Despite the advanced mining techniques of the Classical Era, neither dangers nor poor ore could always be predictable. To overcome the fear that caused by their work conditions, miners as well as investors often sought refuge in religion. This may be a logical conclusion, based not only on the names of the leases but also to the general religious activity, in the mining area of Laurion. Inside the territory of some ore processing plants, several kernoi (ritual vessels used in the cult of Rhea, Cybele and Demeter) have been discovered [14]. Moreover, the cults of Hermes, Zeus, Artemis, Demeter, Cybele, Asklepios and the heroes Simachos and Eudotis, amongst others, have been evidenced by votive inscriptions, excavated in the area [8, 15]. Poletai inscriptions provide also numerous references to local sanctuaries (P6: 7, P18: 77, P26: 383, 385, 535, 537, P39: 3), temenoses (P26: 378, 552) and heroa (P26: 539), as boundaries of leases.

The above mentioned gods and heroes would correlate strongly with the names of the mines. The important influence of local cults on their names is apparent, to some extent. However, it is not essential that all the 27 different names of deities or heroes, in Poletai and horoi, correspond to the cults found in Laurion. For instance, Hephaestus, Dioskouroi or the

hero Kephalos can be closer connected to the cults of other Attic demes or phratries rather than to the ones of Laurion, due to lack of the relevant archaeological evidence.

It is probable that, in the 5th century B.C., the cult of Artemis was very influential in Laurion or she was worshipped as the patron goddess of this area. It would be then reasonable that a lot of mine owners, in order to enjoy her protection, called their leases Artemisiakon, in favor of the goddess. Such a practice could have become gradually a custom. In this way, it may be explained the disproportionate number of the homonymous mines, which represent the 24% in Poletai and the 22% in horoi of the total number of the references. It can be also assumed that mine owners of later years followed the same custom but, instead of the name of Artemis, they selected others too.

Although the criteria for choosing a name cannot be exactly specified, divination often played a key role. Mine owners consulted mainly seers but also oracles. Plutarch states a fragment of Pasiphon. According to this passage, the Athenian politician and general Nicias employed a seer to consult him theoretically for public matters but in practice he was more anxious about his silver mines in Laurion. They were highly profitable but work in them was very dangerous (Plutarch, Nicias 4.2). In Aves, the birds will use mantic inspiration to help people to find the richest mines (Aristophanes, Aves 592-595). Moreover, an unpublished lead tablet from the oracle of Dodona testifies the refuge of a mine owner, probably of Athenian origin, to Zeus. He asked the god whether to keep exploiting the recently opened gallery or not [16].

The lack of any oracle from Delphi on mining activity is seemingly strange, yet it is explicable. The long procedure as a prerequisite for receiving an oracle from Pythia, which took place only once a month, acted as a deterrent to mine owners. Dodona was much more open to public than Delphi and the procedures were less time-consuming [17]. In case of mining, divination, as a part of religion, helped people to win the favor of gods to their work, so as to calm their fears. It seems improbable though that seers and oracles got involved to technical issues, beyond their scope.

A study of the names of the Laurion mines raises the issue of the influence of ancient Greek religion on metal production and economy, during the 4th century B.C. The range of epigraphical, historical and archaeological testimonies about Laurion allows us to build up a picture of miners' and mine owners' attitude towards religion. In particular, the names of the mines are indicative of their need for divine protection of their work and how they tried to ensure it.

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ΣΤΑΤΙΣΤΙΚΗ ΑΝΑΛΥΣΗ ΤΩΝ ΟΝΟΜΑΤΩΝ ΤΩΝ ΜΕΤΑΛΛΕΙΩΝ ΤΟΥ ΑΡΧΑΙΟΥ ΛΑΥΡΙΟΥ

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ΠΕΡΙΛΗΨΗ

Ο στόχος του παρόντος άρθρου είναι να αναδείξει το ζήτημα των ονομάτων που αποδίδονταν στα μεταλλεία του αρχαίου Λαυρίου. Καταγράφεται η γενική τάση, οι μεταλλειοκτήτες να δίνουν ονόματα στα μεταλλεία τους προς τιμήν μιας θεότητας ή ενός ήρωα, όχι απαραίτητα συνδεδεμένων με τις τοπικές λατρείες. Τούτο μαρτυρείται από τις επιγραφές παραχωρήσεων μεταλλείων στην Αγορά της Αθήνας αλλά και από τους όρους των ιδιοκτησιών που βρέθηκαν στην αρχαία βιομηχανική περιοχή του Λαυ-

ρίου.

Επιχειρείται η παρουσίαση των στατιστικών δεδομένων και η ανάλυση των ονομάτων των μεταλλείων, αφού αυτά έχουν κατηγοριοποιηθεί, σύμφωνα με την προέλευση και τη σημασία τους. Επιπροσθέτως, το άρθρο πραγματεύεται το ζήτημα του ρόλου αυτών των ονομάτων και τα κριτήρια για την επιλογή τους από τους μεταλλειοκτήτες.

Λέξεις κλειδιά: Λαύριο, παραχωρήσεις μεταλλείων, αρχαία Ελληνική θρησκεία, παραγωγή, μαντεία.

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