

EDMUND PAUL CUEVA
University of Houston Downtown

Binding the Nose: Smiths and the sense of smell*

There exists an Athenian Kerameikos tablet that has posed interpretation difficulties. Ogden (Ankarloo and Clark 1999, 28), using the tablet below as an example, notes that some curse tablets have no apparent significance, in this instance, the binding of the nose poses a problem. I quote, «... the parts singled out for binding are not always of obvious relevance: why for example, the nose of a silversmith's bellows-operator (*SGD* no. 3 = *CT* no. 72)?» The Greek text of the curse tablet is as follows:¹

Λυσανίας ἐκ τῷ ἀργυ
ροκοπίῳ φυσῆτέες
καὶ αὐτὸς καὶ ἑ γυνὴ καὶ
τὰ χρέματα καὶ ἡότι ἐργά
ζεται καὶ τὰ χρέματα
καὶ χῆρες καὶ πόδε[ς] κα[ὶ νῶ]ς
κεφαλῆ, ῥὶν ἀνθεμ. . . ν .
γῆς hierās.

In this paper I suggest that the author of the tablet knew what he was doing when he cursed the smith's nose: the curse's author was very aware of the fact that smell played a very important role in the production, i.e. smelting, of silver—in particular if chemicals and metals such as lead and arsenic were being used or resulted as byproducts from the creation of the metal.

The use of curse tablets to bind different parts of the body was a common function of these instruments. For example, below are three curse tablets (Ankarloo and Clark 1999, 27, 6, 32) that bind body parts or items associated with the victim of the curse. This first inscription enumerates commonly bound parts:

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¹ The text is from Peek 1941, 89.

I bind Iphemythanes and Androstheneas and Simmias and Dromon. I bind their hands and feet before Hermes the restrainer; so too their souls, tongues, work and profits. (*DTA* no. 86 = *CT* no. 67, Attica, iv. BC)

Specific binding spells on specific body parts or implements were also cast for specific trades. For example, this second tablet is aimed at litigants and the third at an athletic competitor.

The tongue of Eucles and the tongue of Aristophanis and the tongue of Angeilis and the tongue of Alciphron and the tongue of Hegastratos. The tongues of the advocates of Eucles and Aristophanis. (*SGD* no. 95 = *CT* no. 49 = Jameson et al., 1993: 126 *c* side A).

Poseidon ... bind the bronze spear of Oenomaus (Pindar, *Olympian* 1.75–8).

These are types of binding tablets that follow the regular formulae of binding and that do not pose a challenge to interpretation based on the trade of the victims.

The tablet was found in the Kerameikos cemetery in Athens.² It is made of lead, measures 9 x 5 cm; the upper right corner of the table is partially folded. The artifact probably dates to around the end of the fifth century BC; Gager suggests that the tablet is perhaps the earliest «preserved *defixio* from the Greek mainland» (1992, 163). The writing of each line goes from right to left and spelled backwards. The translation of the text is as follows:

(I bind—there is no verb of binding) Lusantias the blower from the silver works—him and his wife and (his) possessions and whatever work he produces and (his) possessions and hands and feet and mind and nose ... curse ... of the sacred Earth.

It has been suggested that the lack of a verb meaning ‘to bind’ is in line with the proposed early date and that the script itself belongs to the mid to late fifth century according to Peek (1941, 89–90). Jeffrey agrees that the tablet was from the fifth century based on the context and possibly on the basis of the script, but there is some disagreement on the dating of the tablet.³ Jeffrey’s Athens number 19, which is numbered as number 3 in Peek, is of interest:

19. (Pk 3). Lead scroll, found in a grave dated by its contents to the middle of the fifth century or a little later. L. to r., Ionic alphabet. Formula: Καταδῶ τὸν δεῖνα καὶ ψυχὴν τὴν τοῦ δεῖνα καὶ ἔπη καὶ ἔργα παρὰ Περσεφόνη καὶ Ἥρμῃ.

² The following observations on the tablet are from Gager 1992.

³ Peek’s nos. 3 and 5 are in Jeffrey’s article nos. 19 and 20; Peek’s nos. 1 and 2 are Jeffrey’s nos. 21 and 22.

In this scroll we find an instance of a ‘binding’ verb, καταδῶ, which is missing from the tablet under discussion. He continues his observations with some comments on Peek numbers 1 and 2 (Jeffery, numbers 21 and 22).

21–22. Two *pinakia* found in the later fill of the fourth century. Both are written backwards; they curse the same man, Lysanias, ἐκ τῷ ἀργυροκοπίῳ φυσεῖτες, and his wife, in body and deed. Attic script, but for Ionic *lambda*. Mid-fifth century?

The second tablet is in very bad condition and it is close to impossible to read the inscription accurately. The name of Lysanias is badly damaged but the ἀργυροκοπίῳ is clearly decipherable. The text is pretty straightforward for the most part. Jordan glosses the text as «Spelled backwards. Against Λυσανίας ἐκ τῷ ἀργυροκοπίῳ, his wife, chat-tel, and bodily and mental parts. Ends with the unexplained phrase ἀνθεμ. . . ν . γῆς ἠερᾶς» (1985, 155). The intended victim is, of course, Lysanias, who is identified as both an ἀργυροκοπίῳ and a φυσητής; that is, a silver-smith and a ‘blower.’

A φυσητής was a bellows operator employed either in privately owned shop or public mine.⁴ Gager observes that the «occasion of the tablet is not given, although the mention of Lysanias’ profession, his possessions, and his products suggests an economic problem» (164). Was the author of the curse cheated in one way or another? We shall never know. What we do know is that someone was angry enough with Lysanias to not only go after him, but also his wife, possessions, and the product of his craft. But what about the nose? In order to answer this question it is necessary first to make a connection between the sense of smell, metallurgy (specifically silver smithing), and any potential danger that can occur when one produces silver.

It is difficult to date accurately when silver or gold was first smelted. Silver beads and buttons may date as early as the fifth millennium BC (Wertime 1973, 883). Gold coins were first introduced into usage by the Egyptians around 3400 BC and the monetary

⁴ Manetho Astrologus writes in his *Apotelesmatika* on the φυσητής: Ἡέλιος δ’ ἦν τῶδε συνῆ, πυροεργέας ἄνδρας / ῥέζει χαλκοτύπους, ἢ φυσητὰς ὑέλοιο, / ἢ βαφέας μογερούς, ἢ κλιβανέας σκοτοεργούς: / οὔτοι γὰρ καὶ νυκτὸς ἀργυρπητῆρες ἐόντες / νύκτα μὲν ἐργάζονται, ἐν ἡματι δ’ ὑπνώουσιν (1.78–82) («And if the Sun is in conjunction with it, it makes men who work at the fire, workers in copper or blowers of glass or toiling dyers or bakers who work when it is dark. For they, being sleepless at night, work during the night, but during the day they sleep.»); the Greek text is from Koechly 1858 and the translation from Lopalito 1988. Dioscorides Medicus in his *De materia medica* notes (5.85): ὁ δὲ τοῖχος τοῦ οἰκῆματος, ᾧ πλησιάζει ἡ κάμινος, τιτράται λεπτῶ τρήματι ἄχρι αὐτῆς τῆς χώνης εἰς παραδοχὴν φυσηματος· ἔχει δὲ καὶ θύραν σύμμετρον πρὸς εἴσοδον καὶ ἔξοδον κατεσκευασμένην ὑπὸ τοῦ τεχνίτου. συνῆπται δὲ τούτῳ τῶ οἰκῆματι ὁ ἕτερος οἶκος, ἐν ᾧ αἶ τε φῦσαι καὶ ὁ φυσητής ἐργάζεται («The wall of the house next to the chimney is drilled through with a small hole into the furnace for holding the bellows. It has also a proper door made for the workman to go in and come out. Joined to this room is another room, in which the bellows and the bellows blower work.»); the Greek text is from Sprengel 1828 and the translation from Osbaldeston and Wood 2000, 783.

use of silver perhaps is as old of that of gold, but in far less abundance. Greenwood and Earnshaw (2012, 1173–1774) write that it appears «that by perhaps 3000 BC a form of cupellation was in operation in Asia Minor and its use gradually spread, so that silver coinage was of crucial economic importance to all subsequent classical Mediterranean civilizations.» Greenwood and Earnshaw (2012, 1173 n. †) define cupellation as a process that essentially consists «of heating a mixture of precious and base (usually lead) metals in a stream of air in a shallow hearth, when the base metal is oxidized and removed either by blowing away or by absorption into the furnace lining. In the early production of silver, the sulfide ores must have been used to give first a silver/lead alloy from which lead was then removed.» Most importantly for this essay, White (2000, 89–91) observes that silver is «usually found in combination with sulphur, antimony, and arsenic.»

Arsenic occurs naturally in combination with oxygen, chlorine, and sulfur; it is rarely found in a pure form. It is very dangerous, especially as arsine gas, which is colorless, nonirritating, and has a mild garlic odor; this odor may be difficult to detect when other chemicals or metals are being used in the production or refining of metals since it is a by-product of smelting (Hamilton, Hardy, and Finkel 1983, 28). Moreover, silver is usually contaminated with arsenic. Indeed, arsine gas is so toxic that it still poses risks even in modern industrial practices. Since inhalation is the major modern form of exposure, imagine how susceptible the ancient bellows-operator or silversmith was to this poisoning.⁵ Cobb and Goldwhite (1995, 8) write that among the Egyptians the smelting of arsenic compound metals died out since «fumes from the process would have caused arsenic poison, so it may have been the artisans, rather than the art, that disappeared.»

It is necessary to look at both ancient and modern observations on the methods for the extraction of silver and gold since the discovery or use of smelting has left no records and we do not have any detailed accounts from the smelting workmen. One can also resort to an examination of the ancient artistic depictions of metallurgy. Humphrey, Oleson, and Sherwood (2003, 195) write that the ancient sources for metallurgy are scarce; the exception is Pliny, who «compiled a large amount of information from earlier sources. Unfortunately some of it is confused or misleading ...» The ancient sources on cupellation are extremely fragmentary; Humphrey, Oleson, and Sherwood cite Pliny *HN* 33.69 and *Psalms* 12:6. Interestingly, the authors do include this passage from Strabo (*Geography* 3.2.8): τὰς δὲ τοῦ ἀργύρου καμίνους ποιοῦσιν ὑψηλάς, ὥστε τὴν ἐκ τῶν βῶλων λιγνὺν μετέωρον ἐξαίρεσθαι· βαρεῖα γὰρ ἐστὶ καὶ ὀλέθριος («The furnaces for silver are constructed lofty, in order that the vapour, which is dense and pestilent, may be raised and carried off.»)⁶ Evidently, the Turdetani of Spain knew that the smoke or vapor from the silver furnace was not quite right.

⁵ As Eissler notes (1891, 10) that the arsenate of lead, mimetite, will «give a bead of lead on charcoal before the blowpipe, giving off arsenical fumes.»

⁶ The Greek text is from Meineke 1877 and the translation from Hamilton and Falconer 1903.

Blakely (2006, 265 n. 97) supplies other passages from ancient texts that clearly reference the dangers associated with smelting:

denique ubi argenti venas auri que secuntur,
terrai penitus scrutantes abdita ferro,
qualis expiret Scaptensula subter odores?
quidve mali fit ut exalent aurata metalla!
quas hominum reddunt facies qualisque colores!
nonne vides audisve perire in tempore parvo
quam soleant et quam vitai copia desit,
quos opere in tali cohibet vis magna necessis?⁷

Lucretius, *De rerum natura* 6.808–815

τὸ δὲ σανδακουργεῖον ὄρος κοῖλόν ἐστιν ἐκ τῆς μεταλλείας, ὑπεληλυθότων αὐτὸ τῶν ἐργαζομένων διώρυξι μεγάλαις· εἰργάζοντο δὲ δημοσιῶναι μεταλλευταῖς χρώμενοι τοῖς ἀπὸ κακουργίας ἀγοραζομένοις ἀνδραπόδοις· πρὸς γὰρ τῷ ἐπιπόνῳ τοῦ ἔργου καὶ θανάσιμον καὶ δύσοιστον εἶναι τὸν ἀέρα φασὶ τὸν ἐν τοῖς μετάλλοις διὰ τὴν βαρύτητα τῆς τῶν βώλων ὀσμῆς, ὥστε ὠκύμορα εἶναι τὰ σώματα. καὶ δὴ καὶ ἐκλείπεσθαι συμβαίνει πολλάκις τὴν μεταλλείαν διὰ τὸ ἀλυσιτελές, πλείονων μὲν ἢ διακοσίων ὄντων τῶν ἐργαζομένων, συνεχῶς δὲ νόσοις καὶ φθοραῖς δαπανωμένων.⁸

Strabo, *Geography* 12.3.40

argenti vena in summo reperta crudaria appellatur. finis antiquis fodiendi solebat esse alumen inventum; ultra nihil quaerebatur. nuper inventa aeris vena infra alumen nullam finem spei fecit. odor ex argenti fodinis inimicus omnibus animalibus, sed maxime canibus. aurum argentumque quo mollius, eo pulchrius. lineas ex argento nigras praeduci plerique mirantur.⁹

Pliny, *HN* 33.98

⁷ The Latin text is from Rouse and Smith 1975; the translation from Melville, Fowler, and Fowler 1997: «And when men follow veins of gold and silver / Searching with picks the secrets of the earth, / What smells Scaptensula breathes out from under! / What evil noxious fumes come up from gold mines! / What do they make men look like, and what colours! / Have you not seen or heard how speedily / Men die and how their vital forces fail / Whom the strong power of necessity / Forces to labour at such work as this?».

⁸ The Greek text is from Meineke 1877; the translation from Jones 1924: «Mt. Sandaracurgium is hollowed out in consequence of the mining done there, since the workmen have excavated great cavities beneath it. The mine used to be worked by publicans, who used as miners the slaves sold in the market because of their crimes; for, in addition to the painfulness of the work, they say that the air in the mines is both deadly and hard to endure on account of the grievous odor of the ore, so that the workmen are doomed to a quick death. What is more, the mine is often left idle because of the unprofitableness of it, since the workmen are not only more than two hundred in number, but are continually spent by disease and death».

⁹ The Latin text is from Mayhoff 1906; the translation from Bostock and Riley 1855: «The vein of silver that is found nearest the surface is known by the name of ‘crudaria.’ In ancient times, the excavations

τοῖσι μὲν οὔτε βοῶν ἄροτος μέλει, οὔτε τις ἄλλη
 φυταλιῆ καρποῖο μελίφρονος· οὐδὲ μὲν οἶγε
 ποιίμνας ἐρσήεντι νομῶ ἔνι ποιμαίνουσιν.
 ἀλλὰ σιδηροφόρον στυφελὴν χθόνα γατομέοντες
 ὦνον ἀμείβονται βιοτήσιον, οὐδέ ποτέ σφιν
 ἤως ἀντέλλει καμάτων ἄτερ, ἀλλὰ κελαινῆ
 λιγνύι καὶ καπνῶ κάματον βαρὺν ὄτλεύουσιν.¹⁰

Apollonius, *Argonautica* 1002–1008

It is clear from these passages that the excavation and smelting of precious ores were dangerous and dirty endeavors (Lucretius: *qualis expiret Scaptensula subter odores? / quidve mali fit ut exalent aurata metalla!*; Strabo: θανάσιμον καὶ δύσοιστον εἶναι τὸν ἀέρα φασὶ τὸν ἐν τοῖς μετάλλοις διὰ τὴν βαρύτητα τῆς τῶν βώλων ὀσμῆς; Pliny: *odor ex argenti fodinis inimicus omnibus animalibus, sed maxime canibus*; Apollonius: οὐδέ ποτέ σφιν / ἤως ἀντέλλει καμάτων ἄτερ, ἀλλὰ κελαινῆ / λιγνύι καὶ καπνῶ κάματον βαρὺν ὄτλεύουσιν). Of special importance is the fact that in these passages the sense of smell or the odor from excavation or smelting are stressed. But what exactly is this odor?

Strabo (3.2.10) and Pliny (33.95) describe the smelting of silver in vague terms; the latter in more detail than the former. J. F. Healy notes that this smelting could not have occurred without the use of lead in order to collect the silver during the smelting process (Healy 1978, 157). He further states (1978, 158) that silver was extracted through the use of reduction and cupellation. The former process reduced the «argentiferous galena ... to its metallic state ... When the partly roasted ore, which consists of lead oxide and unchanged sulphide, is heated to a relatively low temperature, the oxide and sulphide react together, metallic lead is released, and carries silver, antimony and other impurities with it.» For cupellation, he writes «... the argentiferous lead is next converted into a scum of oxide ...». Oleson (2008, 104) observes that the smelting of silver was a complicated process and that much silver was obtained from traces in lead ores or that lead had to be added into the process in order to extract the silver. Truly, the history of lead, Nriagu writes, would be «quite dull were it not for the characteristic marriage of silver to

used to be abandoned the moment alum was met with, and no further search was made. Of late, however, the discovery of a vein of copper beneath alum, has withdrawn any such limits to man's hopes. The exhalations from silver-mines are dangerous to all animals, but to dogs more particularly. The softer they are, the more beautiful gold and silver are considered. It is a matter of surprise with most persons, that lines traced with silver should be black.»

¹⁰ The Greek text is from Mooney 1912; the translation from Seaton 1912: «That folk have no care for ploughing with oxen or for any planting of honey-sweet fruit; nor yet do they pasture flocks in the dewy meadow. But they cleave the hard iron-bearing land and exchange their wages for daily sustenance; never does the morn rise for them without toil, but amid bleak sooty flames and smoke they endure heavy labour.»

the lead ores» (1983, 69). Additionally and more pertinently, Nriagu, in his discussion on the synthesis of galena (lead sulfide), which is used in the smelting of silver, cites two interesting passages, one from Dioscorides (5.96) on galena or molybdena (this was misidentified by Dioscorides) and the other from Pliny (34.50) on his «description of the synthesis of *plumbum ustum*» (1983, 272):

Καίεται δὲ ὁ μόλυβδος οὕτω· λαβῶν μόλυβδου ἐλάσματα ὡς ὅτι λεπτότατα, ἐπίθες εἰς καινὴν λοπάδα, καὶ ἐπιπάσας θεῖον, πάλιν ἕτερα ἐπίθες πέταλα, καὶ θεῖον ἐπιπάσσε, καὶ πάλιν ἕτερα, καὶ τοῦτο ποίει, ἄχρισ ἂν πληρώσης τὴν λοπάδα, εἶτα ὑπόκαιε· ἀναφθέντος δὲ τοῦ μολύβδου, κίνει σιδήρῳ, ἄχρισ ἂν ἀποτεφρωθῆ τελέως, καὶ μηδὲν ἐντρέχη ἀκαῆς μολυβδῶδες· καὶ ἀναιροῦ, σκεπάσας τοὺς ῥώθωνας· βλαβερὰ γὰρ ἢ ἀποφορὰ. Ἡ ῥίνισματα μόλυβδου βαλῶν μετὰ θείου εἰς λοπάδα, οὕτω καῖε...¹¹

coquitur ad medicinae usus patinis fictilibus substrato sulphure minuto, lamnis inpositis tenuibus oportisque sulphure et ferro mixtis. cum coquatur, munienda in eo opere foramina spiritus convenit; alioqui plumbi fornacium halitus noxius sentitur. et pestilens est, canibus ocissime, omnium vero metallorum muscis et culicibus, quam ob rem non sunt ea taedia in metallis.¹²

These two passages make quite clear that there was some sort of common knowledge that the extraction or use of lead in the separating of silver from argentiferous lead created a noxious odor that could be quite deleterious to health: καὶ ἀναιροῦ, σκεπάσας τοὺς ῥώθωνας· βλαβερὰ γὰρ ἢ ἀποφορὰ; *alioqui plumbi fornacium halitus noxius sentitur. et pestilens est, canibus ocissime, omnium vero metallorum muscis et culicibus, quam ob rem non sunt ea taedia in metallis.*

Modern scientists and scholars, commenting on ancient and modern extraction or smelting practices, have noted this connection between the production of metals and the sense of smell. Hamilton, Hardy, and Finkel (1983, 146) write that the disease of

¹¹ The translation is from Osbaldeston and Wood 2000, 791: «Lead is burnt as follows. Take plates of lead (as thin as possible), put them into a new pot and sprinkle sulphur on them, and place layers of lead plates and sulphur until you have filled the pot. Then start a fire underneath. When the lead is kindled, stir it with an iron rod until it is perfectly turned into ashes and has nothing leadlike in it. Then take it out (having closed your nostrils, for the vapour is harmful), throw this dust of lead and sulphur into a pot, and burn it.»

¹² The Latin text is from Mayhoff 1906; the translation from Bostock and Riley 1855: «For medicinal purposes the lead is melted in earthen vessels; a layer of finely powdered sulphur being placed beneath, very thin plates of lead are laid upon it, and are then covered with a mixture of sulphur and iron. While it is being melted, all the apertures in the vessel should be closed, otherwise a noxious vapour is discharged from the furnace, of a deadly nature, to dogs in particular. Indeed, the vapours from all metals destroy flies and gnats; and hence it is that in mines there are none of those annoyances.»

«metal fume fever ... is an industrial disease that is as old as metallurgy of brass» and that it is caused by the «freshly formed oxides of a number of metals that include ... silver ...». Hughes (1994, 127), referencing Strabo 3.2.8, identifies the poison in the noxious fumes as created by the processing of lead, which was «often a major component of silver ore.»¹³ Cobb and Goldwhite (1995, 7–8) observe that the earliest way of separating silver involved converting silver into silver chloride, which is a toxic substance, and that

the process of changing metal salts into pure metal is known as *reduction* because the metal without the accompanying oxygen, halogen, or sulfur of the salt weighs less than ore. Eventually workers learned to distinguish various metal-bearing ores by color, texture, weight, flame color, **or smell when heated (such as the garlic odor of arsenic ores)**, [bold font is mine for emphasis] and they could produce a desired metal on demand.

The ore was usually smelted in a kiln that used a long-flame fuel, for example, wood¹⁴; a kiln usually had oxygen provided for the smelting process through a blowpipe (tuyère) or bellows.¹⁵ During the smelting there was a great need for a steady blast of air to maintain the high temperatures that would melt the ore. We do not know how many tuyères or bellows were incorporated in each smelter, but even if a single set of “bellows was operating for each one there must have been more than one workman operating the

¹³ Hughes (1994, 125) cites a passage from Vitruvius (the Latin text is from Krohn 1912; the translation from Morgan 1960): *Exemplar autem ab artificibus plumbariis possumus accipere, quod palloribus occupatos habent corporis colores. namque cum fundendo plumbum flatur, vapor ex eo insidens corporis artus et in diem exurens eripit ex membris eorum sanguinis virtutes. itaque minime fistulis plumbeis aqua duci videtur, si volumus eam habere salubrem. saporemque meliorem ex tubulis esse cotidianus potest indicare victus, quod omnes, et structas cum habeant vasorum argenteorum mensas, tamen propter saporis integritatem fictilibus utuntur.* «This we can exemplify from plumbers, since in them the natural colour of the body is replaced by a deep pallor. For when lead is smelted in casting, the fumes from it settle upon their members, and day after day burn out and take away all the virtues of the blood from their limbs. Hence, water ought by no means to be conducted in lead pipes, if we want to have it wholesome. That the taste is better when it comes from clay pipes may be proved by everyday life, for though our tables are loaded with silver vessels, yet everybody uses earthenware for the sake of purity of taste.»

¹⁴ The use of wood in the smelting of ores and the large-scale use of smelting, both of precious and non-precious metal-bearing ores, caused severe deforestation and environmental pollution; cf. Nriagu 1996 and Hong, Candelone, Patterson, and Boutron 1996.

¹⁵ Although it is not possible to date the introduction of an oxygen-supplying device, Gregg (1934, 22) writes that «Fans probably furnished the breeze at first, but bellows are depicted in Egyptian carvings and pictures of as early a date as 1500 BC.» Bromehead (1940, 109) also points to the lack of knowledge regarding the construction and structure of the apparatus used for the smelting of silver: «Not much is known of the furnaces in which the cleaned galena was smelted; they appear to have been circular, 1 meter in diameter, built of trachyte or schist lined with clay. An artificial blast was supplied, and a clay tuyère [a ceramic blowtube used in the process of smelting] has been found. There is some evidence that the limestone and fluorspar were used as fluxes. In this process only about 60 percent of the metal was recovered.»

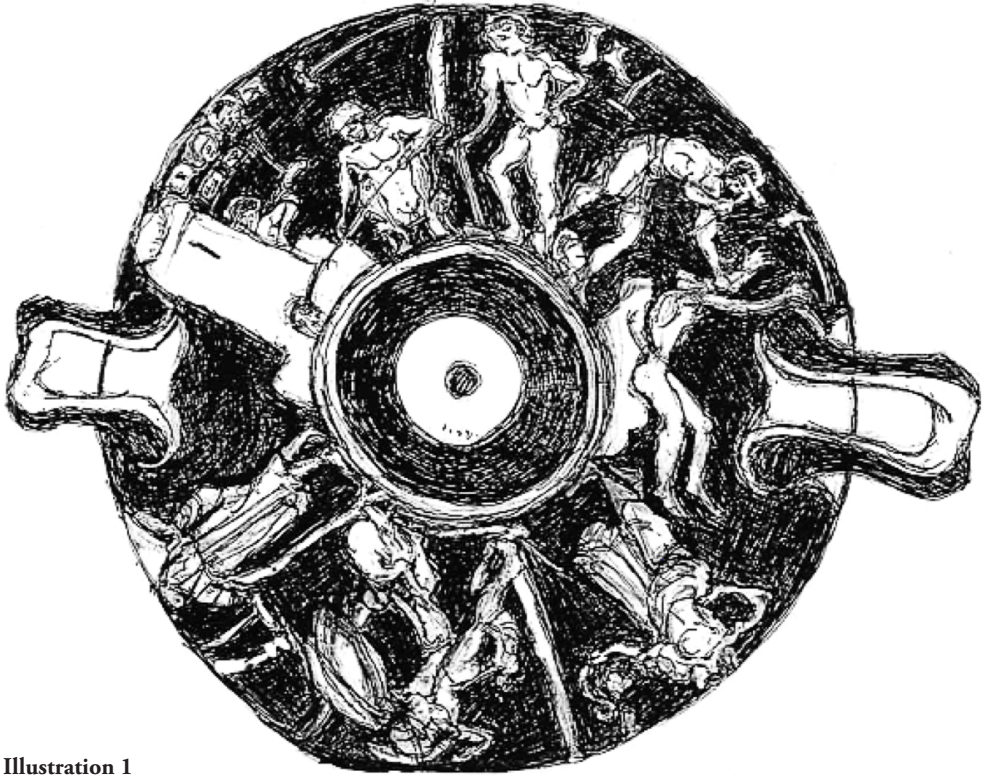


Illustration 1



Illustration 2
Detail of Illustration 1

bellows” (Kassianidou 1998, 236). An example of a variation of furnace can be seen in Berlin F 2294, a red-figure vase from Etruria by the Foundry Painter: in the interior is a scene of Hephaistos and Thetis; in the exterior a foundry with sculptors; the vase dates to around 490 BC–480 BC.

Mattusch (1980, 84) supplies an excellent description of this vase (cf. illustrations 1 and 2): «At the far left of Side A stands a tall cylindrical furnace ... Beside it sits a bearded man on a low cushioned stool; he is nude except for a skullcap. Through a small opening at the base of the furnace, he stokes a long hooked rod. A youth is just visible behind the furnace, where he is laboring over the bellows.» Mattusch records in footnotes 5 and 41 that there is some controversy surrounding the interpretations of the use of the functioning of the furnace depicted on the vase. Footnote 5 contains a thorough bibliography on the furnace; I quote the first part of footnote 41: «Kluge believes that the man seated beside the furnace is using the long pole to remove a plug so that molten metal will run into a mold packed in a casting pit that is invisible in the painting ... A simpler explanation is that the workman is stoking the fire and the boy is working the bellows in an effort to increase the heat of the furnace to the intensity necessary to melt bronze.»¹⁶ What is of special note here is the proximity of both the youth and the seated figure to the furnace and the furnace opening in what Mattusch evaluates as the vase’s highly realistic treatment, which is «precisely rendered, with careful attention paid to technical details, as well as to the overall procedure, and to the various persons involved in the operation» (84). It has already been pointed out that the furnace stacks were tall in order to vent the smoke and harmful odors, but, nevertheless, such proximity might have led to the poisoning of the smiths.

As suggested above, the author of the curse knew what he was doing by binding the nose. If the poor *φυσητής* could not smell the garlicky scent of the arsenic or arsine gas produced by the smelting of silver, he would get sick or perhaps end up dead. The brief overview of the history and production of silver supplies the solution to the binding of the silversmith’s nose.

¹⁶ The Kluge referenced in the footnote can be found in this essay’s bibliographical references.

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