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The Prices of the Athenian Silver Mines

aus: Zeitschrift für Papyrologie und Epigraphik 120 (1998) 57–63

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Introduction

Langdon's recent publication of the *poletai* records[1] provides a suitable opportunity to look again at the administration of the silver mines whose "sales" from 367/6 – c.300/299 B.C. form a substantial part of these records.[2] This re-editing of the mine sale inscriptions puts together for the first time in a single corpus all the relevant material found to date. And Langdon's text, while inevitably owing much to the work of Crosby[3], wisely removes some of her more conjectural restorations. As a result, prosopographical work in particular can now rest on a firmer basis. But some questions about the actual administration of the mine sales still require further investigation.

The most detailed analysis of the mine sale texts from this latter point of view remains that of R. J. Hopper, most notably in his article published in 1953.[4] Hopper's views, which like Langdon's text owe a heavy debt to Crosby, have to a large extent become something of an orthodoxy owing in large measure to their authoritative handling of a large range of issues together with a well-researched survey of earlier scholarship.[5] In consequence there has been little if any new discussion on this aspect of the mine records.[6] But, as I shall show, there are inadequacies in both Crosby's and Hopper's discussions which leave some problem areas worth further investigation. One of these concerns the interpretation of the prices for which the mines are sold.

The Range of Prices: Problems of Interpretation

The wide variation of prices in our records creates enormous difficulties for understanding how the system worked. But two are clearly dominant.

In the 74 complete prices which have survived[7] 39 are at 20dr. and 21 are at 150dr. But there is also a variety of other prices, including some very large sums. Our literary sources – a few surviving speeches of 4th cent. orators – add a few more examples which confirm the smallest 20dr. price, and also the selling of mines for extremely large sums.[8] Table 1 below lists all the complete prices, with the individual prices (in drachmai) in the first row and the numbers of mines sold at each price in the second.

* I am happy to acknowlege the help I have received from Professor Michael Crawford who provided me with valuable comments on an earlier draft.

[1] In *Agora* 19, 1991, 2–137.

[2] In Langdon's numbering they appear in P5-P16, P18-P30, P32-P41, P43-P44 and P50-P51.

[3] See *Hesperia* 19, 1950, 189–312 and *Hesperia* 26, 1957, 1–23.

[4] The Athenian Silver Mines of the Fourth Century BC, *BSA* 48, 1953, 200–254. See too R. J. Hopper, The Laurion Mines: A Reconsideration, *BSA* 63, 1968, 293–326.

[5] Thus Langdon himself refers the reader to Hopper's work for an analysis of the administration of the mine sales: cf. Langdon (n. 1) 60.

[6] By far the most stimulating recent work, which does not concern itself with details of the administration, is that of Robin Osborne in *Demos: The Discovery of Classical Attica,* Cambridge 1985, 111–126 (= Patterns of Exploitation in the Athenian silver mines).

[7] There are also traces of a further 28 prices, some of which fall within certain ranges while others can only be *minima.*

[8] This evidence is discussed below.

Table 1: Breakdown of All Complete Prices

20	50	130	150	160	200	500	800	900	1210	1550	6100
39	1	1	21	1	3	2	1	1	1	2	1

Neither Crosby nor Hopper provides a completely satisfactory explanation of this considerable range of variation. Crosby sees the prices as related to the size of individual mines and concludes from the patterns displayed by the records that “most of the concessions seem to have been about the same size”[9] – an assertion for which she offers no evidence other than the frequency of some of the prices. It is not easy to see why most mine operators *would* have similarly sized areas of exploitation. Crosby is also prepared to admit the possibility of a factor other than size, namely profitability, operating in the case of the high-priced mines. So within her own terms she fails to provide a single coherent explanation .

Hopper’s account also presents difficulties. He explains the wide variety of prices, including the large ones, by appealing to the notion of competition. We know, of course, that auction was a common feature of Athenian procedure, being adopted for the sale of confiscated property and the collection of state taxes. In itself this suggestion has a prima facie plausibility and is inherently more likely than Crosby’s claims about the uniformity of size in mine exploitations. And it may be accommodated by Aristotle’s claim that the state sold the mines ὅτῳ ἂν ἡ βουλὴ χειροτονήσῃ [*Ath. Pol.* 47,2].

But the view is not free of difficulties. To accommodate the obvious dominance of the 20dr. and 150dr. prices, a pattern which would seem to militate against the principle of competition, where we would expect to find considerable price variability, Hopper has to propose the existence of a mixed system whereby some prices were ‘fixed’ while others were the result of auctions. While ‘fixed’ prices for new mines has some plausibility,[10] it is hard to see why all ‘renewals’ should have been sold at the same price fixed by the state – either 150dr. if re-bought by the original owner or “around” (Hopper’s phrase) 150dr. if taken over by a new operator. Such an arrangement seems inherently improbable, since mines once worked upon must have produced differing sizes and levels of profitability. Moreover, such uniformity of price would be a particularly odd arrangement in the system envisaged by Hopper where he allows for the existence of competitive bidding. Why should Athens have apparently chosen not to employ a system of competitive bidding for mines so successful that their operators wished to extend their period of ownership? And at what point, and on what grounds, did the state decide to allow competition, as Hopper believes to have happened in the case of the mines which were bought for large sums?

A Working Hypothesis

I suggest that we should interpret the mine sale prices in the light of the “5dr. payment in the silver mines” mentioned in one of the mine records. In P26, lines 463–498,[11] the property of Meixidemos of Myrrhinous is sold by the state because, as guarantor for a number of defaulting tax farmers, he had failed to pay up in their stead.[12] One of the defaulters for whom Meixidemos acted as guarantor was Philistides of Aixone who, besides sharing in farming the metic tax (lines 470–474), was also involved in collecting dues for the silver mines for which once again Meixidemos was guarantor:

ἑτέραν ἐγγύην [sc. ἐνεγυήσατο] ἐν τοῖς ἔργοις τὴν πεντεδραχμίαν (P. 26,474–475)

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[9] Crosby (n. 3) 202.

[10] It is generally accepted that the 20dr. price was a ‘norm’ in the case of new or re-opened mines.

[11] Langdon, *Agora* 19, 1991, 114–115.

[12] Several of our surviving mine sale records, like P26, include records of property confiscations since the *poletai* who were in charge of the mine sales were also involved in the sale of property confiscated by the state.

It is generally assumed, I think correctly, that this phrase refers to a 5dr. tax in the silver mines.[13] But even if the πεντεδραχμία was not an actual tax, it was clearly a regular payment due each prytany, by those exploiting the mines. In the case of Philistides he, and then his guarantor Meixidemos, had defaulted on the instalments due in the 6th, 7th and 8th prytanies. In what follows I suggest that the wide range of payments mentioned in the mine sale records may be interpreted more satisfactorily if we analyse them in terms of this 5dr. mine fee.

A remarkable feature of the surviving prices listed in Table 1 above is that without exception the figures are divisible by the number 5.

It has of course to be remembered that we have only partial information about prices in the 218 mine sales which we can now detect in the surviving records. In only 74 cases do we have complete figures for the prices. But 74 is in itself a significant sample. That all these prices should show this same periodicity is unlikely to be the result of chance. If my earlier suggestion of connecting the mine sale prices with this 5dr. tax carries conviction, then for our present purposes of explaining the wide range of prices found in the mine records, we may put forward the hypothesis that on the basis of a 5dr. tax per prytany, or 50dr. per year, all the surviving prices can be explained as referring to different periods of operation.

This hypothesis fits in precisely with the figure of 150dr. which is recorded for *all* the *ergasima* mines in the sale documents.[14] Aristotle states that these particular mines were sold for a period of up to 3 years:

τὰ μετάλλα πωλοῦσι . . . τὰ τ' ἐργάσιμα τὰ εἰς τρία ἔτη πεπραμένα[15] [Ar. *Ath. Pol.* 47,2]

A 3-year operation on the assumption of a 5dr. tax per prytany would yield the sum of 150dr. which we do indeed find in the case of mines classified as *ergasima*.

If the sums of money which appear in the mine sale records are indeed related to the 5dr. per prytany payment then some apparent peculiarities observed by commentators on the mine sale prices can be explained. Firstly, problems have arisen concerning two very frequent prices. The figures in Table 1 above show that 150dr. and 20dr. are particularly cornmon. 150dr. occurs in 21 of the 74 complete prices which have survived, and 20dr. occurs on 39 occasions. The traditional view has seen a link between these prices and the classifications of the mines. 150dr. has appeared to be connected with mines which are *ergasima* while 20dr. has seemed to be the price of a mine which is classified as *palaion anasaximon*. Table 2 below, which summarises information from all the records where both prices and classifications have survived, clearly confirms these two apparent patterns.

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[13] This is the view of the first editor, Merritt, who translates "[M. guaranteed] another bond on the mines for the five drachmai tax" (*Hesperia* 5, 1936, 506). This interpretation is followed by Osborne (n. 6, 216 n. 5), who observes that after the word Φιλιστίδην "the phrase μετασχόντα τέλους (with genitive) is omitted for Philistides' part in the 5dr. tax in the mines". Both the other references, in the case of Meixidemos, to fixed sums due to the state have the word τέλος attached to them (the 5dr. sum due to Theseus in lines 134–135, and the 1dr. sum due to Asclepias in lines 142–143). See my own discussion of the implications of such a mine tax (n. 11).

[14] Although there are now many gaps it is clear that originally all the mines were classified in three main categories of παλαιον ανασαξιμον, ανασαξιμον and εργασιμον. The meanings of these various classifications is disputed, hut there is general agreement that παλαιον ανασαξιμον refers to an old mine being re-opened. And Crosby has shown that ανασαξιμον generally refers to a mine which is being taken over by a new owner, while εργασιμον refers to a mine whose existing owner is renewing his operation. It is not my intention here to discuss these terms of classification in detail. Very briefly, I think that ανασαξιμον (from ανασαττειν = to load up, LSJ s.v.) refers to a mine which, whether "old" (παλαιον) or merely being handed over to a new operator, is "to be loaded up" with the necessary equipment for operation to start.

[15] Translators, including the most recent editor Langdon, seem not to take account of the fact that εις, when used with numbers can have the meaning of "up to" as well as referring to an exact number.

Table 2: Mine Prices by Classification

	20	130	150	160	500	1210	Total
pal.anas.	11	0	3	0	1	0	15
anas.	1	1	1	1	0	1	5
ergas.	0	0	6	0	0	0	6
Total	12	1	10	1	1	1	26

All of the six mines classified as *ergasima* carry the 150dr. price. Table 2 also reveals that eleven of the fifteen mines classified as *palaia anasaxima* carry the 20dr. price. But there are obvious exceptions to these patterns which have puzzled editors and demanded explanation. Prices of 150dr. occur where mines are *not* classified as *ergasima.* And one price of 20dr. appears where the mine is not classified as *palaion anasaximon.* On my hypothesis that the prices of the mines reflect the 5dr. per prytany charge referred to in P.26, lines 474–475, these difficulties can be resolved. There are indeed regular patterns in the prices, but they are not to be understood in terms of the different classifications of the mines, and apparent “exceptions” are, on my view, not in any way anomalous.

It is a corollary of my hypothesis that the prices are directly related not to the classification of the mines but to the length of exploitation. On this view 150dr. is the price of a 3-year operation. *Ergasima* mines therefore cost 150dr. not qua *ergasima* but because they were restricted to a 3-year period of operation, as Aristotle informs us. Any mine, however classified, would cost 150dr., if it was being sold for a 3-year period of operation.

Similarly the 20dr. price need not be confined to any one classification. I agree with the traditional view that, in the case of old mines being reopened (the *palaion anasaximon* classification) the 20dr price has the appearance of a fixed fee. Such mines would constitute a considerable risk to exploit – they would be likely to require extensive installations, and they might even turn out not to be worth exploiting. It would therefore make sense not to charge a fee on the normal prytany basis until such mines became fully operational.[16] But on my hypothesis 20dr. would also be the cost of a short, four prytany, period of exploitation, and thus the single record of a mine costing 20dr. but not classified as *palaion anasaximon* (Table 2 above) is no longer anomalous.

A further problem has been how to explain the wide variety of prices other than the popular patterns of 20dr. or 150dr. We have already noted some difficulties in the types of explanation traditionally offered. Once more, the 5dr. prytany charge provides a helpful analysis. As we have seen, Aristotle in the *Ath. Pol.* stated that the mines were exploited for either three years (in the case of *ergasima* mines) or ten.[17] On my hypothesis all prices up to and including 500dr. will correspond to various periods of exploitation up to the maximum ten years. It is only too likely in practice that individual operators may have chosen to give up operations before the relevant three or ten year period was over, leaving the next operator to pay for the outstanding amount of time left. Or, alternatively, an operator may have bought a mine in the first place for a period shorter than the three (if re-newing operations) or ten period allowable. We would then expect to find – apart from the old mines being reopened and sold at a 20dr. price – a number of prices other than the 3-year and 10-year sums of 150dr. and 500dr., but not above 500. And these prices would, of course, have to be in multiples of 5. This indeed is what happens. Two prices occur between 20dr. and 150dr. where two mines are sold at 50dr. and 250dr. each. A further four

[16] Some support for such a “standard” fee appears in Dem. 19, 293 where Moirokles is accused of dishonestly exacting payments of 20dr. from men involved in the silver mines.

[17] I follow Langdon in *Agora* 19, 1991, 57 in restoring 10 in Aristotle’s text. The alternative, preferred by Crosby, is 7. A 10-year period of operation would bring the mine sales into line with the normal term for the leasing of public land.

mines are sold between 150dr. and 500dr. – one at 60dr., and three at 200dr. To these we may add the one mine sold at 20dr. which is not an old mine being reopened.[18]

There remain the larger sums above 500dr. Again, as Table 1 shows, they all conform, like the prices below 500dr., to the pattern of being divisible by 5. If we interpret these figures too in the light of the 5dr. tax we can once more solve problems in the traditional account. Large sums have been seen as evidence for competitive bidding. From this it appears that only a small number of mines – there are six prices above 500dr. in Table 1 above – were sufficiently productive to attract rival buyers, and so (on this interpretation) command high prices.[19]

But on my view the essential difference between the large priced mines and the others is that the larger sums involve mines where a number of concessions, covering different areas of the mine, are held by differerent individuals.[20] Both the mine sale records themselves, and contemporary evidence from the Attic orators, refer to partnerships where a number of operators are involved in the same mine. In P21, lines 13–15, Hypereides, Aischulides and the son of Dikaiokrates are all recorded as buyers of the same mine *Ktesiakon* . While this is the only example of such a joint buying to survive in the mine sale records, we have no reason to suppose that it was unique. But the record does not preserve the actual price.

Two passages in the orators, while again not recording particular prices, appear to confirm that at least some mines involved more than one operator. In section 38 of Demosthenes 37 – the only mining court case to survive – the speaker lists the types of offence which may be the legitimate concern of μεταλλικαὶ δίκαι. He mentions two groups of mine operators likely to get involved in such cases. One consists of mine operators who have trespassed underground into the workings of neighbouring mines. The other group who may find they need to have recourse to the law courts are "τοῖς κοινοῦσι μετάλλου".

While κοινεῖν with the genitive, meaning "to share in", normally occurs in the middle voice, the active voice used here has to be translated in a similar way as "those who share in a mine".[21] This specific reference to "sharing" a mine as one of the areas covered by mining laws in itself suggests that the practice was not uncommon. There would have been little point in legislating for an infrequent occurrence.

The second passage occurs in the fourth (third) speech of Hypereides *On Behalf of Euxenippos,* section 35. The speaker alludes to an actual mine (illegally extended, and hence the subject of litigation) which involved a number of wealthy Athenians, along with one Epikrates of Pallene[22]:

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[18] 21 mines were sold at the 3-year operation sum of 150dr. and 2 at the 10-year operation sum of 500dr. The 7 mines which are not being worked for either 3 years or 10 years thus account for 23% (7 out of 30) of the total of mines in operation (apart from the group of old mines being re-opened). In other words, *on the basis of the prices which have survived,* 23% were mines either given up before their term was complete, or bought for periods other than the norms of 3 or 10 years.

[19] My text refers to complete prices only. But we do have traces, among the incomplete prices, of another four mines sold for more than 500dr. In ascending order these are (1) at least 1400dr., and possibly a great deal more if another number(s) preceded the initial χ (P.27, line 13); (2) at least 2000dr., but less than 3000dr. (P.27, line3); (3) at least 3500dr., but less than 4000dr. (P.19, line 4); (4) at least 2 talents, 5550dr., and possibly a great deal more if another number(s) preceded the initial T (P.19, line 30).

[20] Hopper (n. 4, 1953, 223–224) draws attention to evidence that a mine could have had a number of divisions underground, which could be operated by different men.

[21] This is also the view of Gernet in the Budé text. He translates "(J'imagine que les actions minières sont faites pour) des concessionnaires associés". The Loeb translation "those sharing in the business of mining" presents two difficulties. Μέταλλον is not otherwise found as a verbal noun meaning "mining", but appears always to mean the object of such activity viz. the mine itself. Secondly, the translation "those sharing in the business of mining" appears to be ruled out here by the immediate context where the speaker, after listing examples of the areas covered by mining suits – including the sharing of a mine – sums up the purpose of μεταλλικαὶ δίκαι by saying that they apply "ὅλως τοῖς ἐργαζομένοις τὰ μέταλλα". There would be no point in making this remark if the earlier phrase "τοῖς κοινοῦσι μετάλλου" had had this same meaning.

[22] I assume that the description of the mine as belonging to Epikrates implies that he was one, perhaps the major, operator.

> μετεῖχον δ' αὐτοῦ οἱ πλουσιώτατοι σχέδον τι τῶν ἐν τῇ πόλει.

The fact that the operators of this mine are "very wealthy" may perhaps suggest that they had large sums invested in the mine and thus possessed a considerable number of individual concessions. But one other passage in the Attic orators does actually refer to specific, and large, sums of money invested in a mine with more than one operator. This passage is the strongest evidence in support of my contention that the large sums, above 500dr., can also be understood in connection with the 5dr. prytany charge.

In [Dem.] 42, 3 it seems that three men each had a one talent share in a mine confiscated by the state. The unnamed speaker who is involved in an *antidosis* case against Phaenippos claims as part of the evidence for his own impoverishment:

> νυνί με δεῖ τῇ πόλει τρία τάλαντα καταθεῖναι, τάλαντον κατὰ τὴν μερίδα (μετέσχον γάρ ... κἀγὼ τοῦ δημευθέντος μετάλλου).

The precise circumstances are not entirely clear. It is not made explicit whether the speaker himself had all three one talent "shares" in the mine or whether he had only one or two but was somehow, perhaps as a guarantor, responsible for the payment of all three to the state.[23] But, on any interpretation, this passage in [Dem.] 42 is a clear indication that large sums were due to the state for a "share" in a mine which was jointly operated. The 6000dr. share in [Dem.] 42 corresponds closely to the maximum amount which a single individual pays in the mine sale records – the sum of 6100 dr. for a mine in P.26, line 93. On the basis of the 5dr. charge 6000dr. would be the price of operating 12 concessions within one mine for the maximum period of 10 years.

In the light of the evidence discussed above, and particularly [Dem.] 42, the large sums above 500dr. in the mine sales can thus be seen to work on the same principle as the smaller sums. They too can be interpreted as multiples of 5dr. payments, but for a number of different concessions in the same mine.

Conclusion

Given the limitations of our existing evidence the approach outlined above can be no more than a working hypothesis. But, if accepted, it would avoid the difficulties in the explanations given by Crosby and Hopper. And it is an hypothesis whose value can be tested against any future evidence of mine sale prices. Should a price turn up which is not divisible by 5 this would be contra-indicative, and the connection between the mine sales and the 5dr. tax would lose plausibility.

In the meantime the hypothesis, if seen as acceptable, would settle the much disputed question about whether the sums in the records are payments for the whole of a period of operation, or annual payments (both seen as possible by Crosby) or prytany payments (the view adopted by Hopper whom Langdon follows). If I am right in interpreting the sums as payments of the 5dr. mine tax there can be no doubt about what they represent. Since all the *ergasima* mines, which were operated for up to 3 years, cost 150dr. in our records, and since on my hypothesis this would be the precise sum due on the basis of a 5dr. per prytany tax, it follows that this sum must be the *total* for the period of operation. It cannnot be an annual sum or a prytany payment.

This conclusion in turn would have interesting repercussions. If the prices are indeed total payments then the very high level of "profits" which the state acquired, at least on one occasion[24], must imply that a very large number of mining concessions existed at that time. Alternatively, we would have to conclude that the proceeds arising from the sales were not the only, or even the most important, way in

[23] The only place where we clearly have evidence of a guaranty in the mines is the passage in P21, which, as we have already seen, refers to the collection of the 5dr. charge in the mines.

[24] Hdt. 7.144.

which the state accrued wealth from the silver mines. Either of these conclusions would have important consequences for our understanding of the role played by the silver mines in the public economy of ancient Athens.

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