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Quantitative analysis of hoarding in periods of coin deterioration ¹

1. Not only war and political strife but also decisive changes within the economic life and, particularly, the monetary system, activated the hoarding of coins. This is maintained by the Finnish scholar Pekka Sarvas in two studies of eighteenth century hoarding behaviour; the first study ² deals with present day Finnish territory, then part of the realm of Sweden, and during the beginning of that century temporarily occupied by Russian military forces, the second ³ is focused on present day Swedish territory outside the theatre of war (the Great Nordic war in the reign of Charles XII). Sarvas holds the view that the more the coins were regarded as objects of value, the more people were able to value the metal contents of the coins, the more did one hoard money by collecting coins of high metallic value. Sarvas concludes his studies asking his fellow numismatists to study this phenomenon in other periods and parts of the world than in Fennoscandia.

My reply to his challenge will emerge from the tables I propose to show and comment upon here today. In my view Sarvas' observations are valid for the Late Roman Empire, and I would therefore regard them as a major contribution towards a better understanding of the hoarding process.

2. Before considering the hoard statistics, I have to offer you an apology in my capacity of the author of RIC VII. The book was written in the pre-neutron activation era, and is therefore characterized by a wide-eyed innocence as regards certain parts of the monetary system. So most *aes* coins are regarded as *folles* or fractions of *folles*. I should now specify that, in accordance with Jean-Pierre Callu and Michael Crawford, I speak of *nummi* instead of *folles*, and that the *VICTORIAE LAETAE* coin, first

1. This paper presents the focal points of a more substantial study, originally a part of my contribution to the *Aufstieg und Niedergang der römischen Welt*, but subsequently taken over for publication by the FMRD project as *Die spätrömische Münze als Gegenstand von Thesaurierung*.

2. Pekka SARVAS, *De finska myntskatterna från 1700-talet*, in *NNÄ*, 1967, p. 23-146.

3. Pekka SARVAS, *De svenska myntskatterna från 1700-talet*, in *NNÄ*, 1969, p. 116-172.

introduced in A.D. 311, intermittently issued up to 316, and finally coined in abundance from 316-318 (and later) with gradually decreasing silver contents, should be identified with the *centenionalis* (John Kent was the first to make this identification)⁴. From about 320-321 the nummi are entirely ousted by the centenionales, which subsequently were labelled PROVIDENTIAE, GLORIA EXERCITVS and so on. The XIII^e piece struck by Licinius was a *seminummus*, issued alongside the last Constantinian nummi.

3. The starting point of my studies has been to establish why and when nummi and centenionales occurred in the same hoard. With this in view, I formed two groups of hoards, the one with a closing date in the late Sol series, the other opening with the earliest centenionales. These groups are clearly not comparable with one another because they were defined with reference to different criteria. It was therefore thought advisable to form and study some control groups. Consequently, to the group closing in the late Sol issues, was added another group closing with the early Sol coins, i.e. those struck before the nomination of the Caesars Crispus, Licinius I and Constantine I. Further, I chose a group with the last coins from about A.D. 300, when the adjustment of the monetary system was carried out, and another ending A.D.307/8, when the 1/48 reduction took place.

Now, if Sarvas is correct in his views, we should get a series of hoards which

(1) through the series of devaluations in the tetrarchic-Constantinian period, would form a number of *Schatzfundhorizonte*. We would expect to find groups of hoards, with about the same closing date for all the hoards within each group,

(2) within the several groups would be characterized by a select and homogeneous hoard content,

(3) if we find hoards with intrusions (French *queue, dépôts à queue*), these would be the best evidence for the selection of specimens hoarded. Intrusions frequently suggest that a devaluation has taken place, and a new coin or denomination created, which was not accepted for hoarding purposes. The intrusions show that the hoarder was still alive, and active.

4. Finally a few words should be said about the tables and the data entered and evaluated.

(1) The aim has been to work on hoards representative of the hoarding process, if possible on hoards preserved in their entirety.

(2) All hoard publications, representing a century of scholarship of highly varying ambitions and scope, had to be reanalyzed, and revised. Two factors made this absolutely necessary, a) the present knowledge of the

4. J.P.C. KENT, Max and Albert HIRMER, *Roman Coins*, London, 1978, p. 51 f.

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course of the nummus reductions, and b) the awareness of the fact that the Constantinian *aes* coinage covered several denominations (nummi, semi-nummi, and centenionales mainly), which on principle could have been struck contemporaneously and not successively. Consequently, the nummi of the Sol series and the centenionales of the *Victoriae laetae*, *Virtus exercit*, etc., series may overlap at times.

(3) The series of nummi issued about A.D. 300 pose a particularly tricky problem; hoard publications generally list the coins according to mints and rulers, and so, for instance, the first tetrarchy is normally kept together. The Diocletianic edict of 301 and the monetary policy of the preceding time had no impact on the coins issued. It is therefore very hard to identify the coins struck before and after the event on the evidence of the hoard publication.

(4) Similar difficulties are encountered when we try to date coins and hoards exactly although RIC dates are expressed by giving *termini post* and *ante*.

5. The tables will be shown without detailed discussion of their contents. I may differ from the original publication in my interpretation of the structure and the composition of a hoard, but this is not recklessness, as I have pointed out. Let me make the following comments:

Table 1

(1) Prereform coins, i.e. antoniniani, and nummi go well together. Nevertheless we have two types of hoards, those with comparatively few nummi, and those with few or no pre-reform coins.

(2) The dates are at times hard to establish for reasons already mentioned.

(3) If I remember correctly, Thibouville is the only hoard preserved in its entirety. Such hoards are here and on the other tables marked with a cross.

TABLE 1. - HOARDS WITH CLOSING DATE AROUND A.D. 300

Hoard	Number of coins	Composition of hoard			Date of last coins
		pre-284	284-294	nummi	
Clémont	795	449	205	142	300
Dillingen-Pachten	501	-	17	484	300
Emmersweiler	1,229			1,229	297
Ettelbrück	1,981	1,592	251	138	300/1
Fresnoy-lès-Roye I	1,811	1,195	198	418	297/8
Horaion (Thrace)	936			936	pre-1.5.305
Marchovelette	867	190	156	521	pre-1.5.305
Market Stainton	564			564	298
+ Thibouville	3,257	2,680	535	31	297/8
Treviglio	2,674	467	81	2,122	300/1

(4) From this period we have the Algerian Ngaous hoard comprising exclusively neo-antoniniani, showing that hoarders were careful not to mix different denominations when hoarding.

Table 2

The second table illustrates the hoarding of nummi. In two large hoards only do both antoniniani and nummi occur together, and of these Evenley represents two chronologically separate periods of hoarding, the earlier being the pre-tetrarchic era. Generally speaking, this is a sign of one of the results of the 301 revaluation: antoniniani do not mix any more with nummi. The Cairo II hoard is a peculiar case, and my interpretation may appear peculiar. I think we have here two separate populations, divided by a narrow chronological gap, the latter comprising reduced nummi struck exclusively locally, at Alexandria.

TABLE 2. - HOARDS CLOSING ABOUT A.D. 307/8

Hoard	Number of coins	pre-294	Composition of the hoards					Last coins A.D.	
			Nummi issued				Intrusions		
			before 307/8 reduction	According to tetrarchy					
Total									
+ Aleppo	1,288		1,267	1,000	216	51	20	309	
+ Ankara	885	575 ant.	204				103 1/72 1/96	320	
+ Bromley	300		267	150	49	68	25 + 4 1/72	311	
Chipperfield	67		64					307	
Evenley	3,153	705 ant.	2,448					308	
+ Fresnoy-lès-Roye II	139	33	106	97	9			308/9	
+ Fyfield	2,106	1	2,086	1,901	-	185	-	19	307
+ Homs	1,017		995	774	183	38		15	309
+ Cairo II	1,851		1,215						310/1
Kellmünz	1,314		1,239	1,087	-	152	-	71	308
+ Lebanon	182		182						307
Macedon	187		180					7	309
+ Preshaw Park	290		290	194	34	44		13	308/9
Seltz	3,378	1	3,377	714	-	2,663	-		308
Verroia (Beroea)	331	7	324	281	-	32	-	7	309

Table 3

We now approach the focal point of my studies, the Constantinian reformed coinage, here named Sol coinage, issued at 1/72, subsequently at 1/96. I will confine my remarks to two points,

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TABLE 3.

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+ Francavilla Fontaine
+ France
 Gaul
+ Ghlin
 Imbsbach
 Kailak (Pleven)
+ Lignières
 Little Orme's Hoard
 Luxor
+ Margaux
 Marmagen
+ Montbouy II-IV
 Osmerly
 St-Vincent-de-Mer

+ Theadelphia
+ Wettolsheim
+ Wroxton

Table 4

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(1) intruding centenionales are very few, and

(2) we get, in fact, two *Fundhorizonte* here, one at the 1/72 reduction, the other at the 1/96 reduction. In addition I would like to express the suspicion that the start of the heavy coining of centenionales, i.e. *Victoriae laetae* in 316, provoked a similar reaction, and would have created a similar *Fundhorizont*, although it is not visible here.

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TABLE 3. - HOARDS CLOSING WITH THE EARLY SOL ISSUES (BEFORE MAR. 1, 317)

Hoard	Number of coins	Early coins	Coins struck at:				Closing date	Intrusions	Abandonment
			1/32	1/48	1/72	1/96			
+ Antibes	2,880	1 ant.	4	337	269	1,666	317	1 Victoriae	317
Boursies	3,515	1 ant.				2,419	317		317
Čentur A	5,032	3 ant.	342	4,687	2		311	all 1/72	311
Čentur B	2,042								
Domqueur	1,828	1 ant.	1,277	537	5		311	all 1/72	311
+ Francavilla Fontana	181	30 ant.	92	21	38		311		312
+ France	587			5	242	340	317		317
Gaul	180		84	72	23	1	313	1/96 coin	313
+ Ghlin	234		163	36	30		313		313
Imsbach	223	10 ant.	111	48	51		313		313
Kailak (Pleven)	462		5	457					311
+ Lignières	613		414	198	1		311	1/72 coin	311
Little Orme's Head	c.5,032	8 ant.				41(?)		6 Victoriae	317
Luxor	506		1	36	140	329	316/7		316/7
+ Margaux	344		248	94	1		311		311
Marmagen	124	1 Gordian	90	17	16				311/2
+ Montbouy II-IV	3,310	pre-294:1,108	1,379	475	346		311		311
Osmery	61	1	37	14	3		311	all 1/72	311
St-Vincent-de-Mercuze I	304	123 ant.	80	43	47		312/3		313
III	230	138 ant.	46	20	2		311	all 1/72	312
+ Theadelphia	170		5	164	3		311	all 1/72	316/7
+ Wettolsheim	1,092	3 ant.	348	-	734	-	4	313	all 1/96
+ Wroxton	139	3 ant.	46	-	51	-	38		317

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Table 4

The tendency of Table 4, that nummi and centenionales mix poorly, is very clear. Another rare mixture is constituted by nummi and seminummi, as lately noted by M^{me} Brenot in her studies of Bikić-Do, Nebek and Macin. As to the dates, I have to stress that owing to overlapping coining of nummi and centenionales (Sol and *Victoriae*), we have to date the end of the Sol coinage a couple of years later than in RIC, probably in 320.

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TABLE 4. - HOARDS CLOSING WITH THE LATE SOL ISSUES (AFTER MAR. 1, 317)

Hoard	Number of coins	Early coins	Coins struck at				Closing date	Intrusions
			1/32	1/48	1/72	1/96		
+ Bitbourg	403				69	283	317	16 Victoriae
+ Bliesmengen-Boichen	895	7 ant.	- 268	-	620	345	c. 320	
+ Bristol	347	6 ant.			183	158	317/8 (322/3)	2 Victoriae 2 Virtus 2 Beata
Bourton-on-the-Water	2,707	2 ant.		8	- 2,698	-	c. 320	1 Victoriae
Delos	3,797						321	3 Iovi (XIII ^o)
+ Guelta	119	1	2	11	24	95	c. 320	
+ Llangarren	2,823					825	c. 320 (327)	18 Beata, Provident.
+ Trouville de folles	1,492	5 ant.	1	8	324	1,153	c. 320	
+ Waddington	2,965	10 ant.		19	1,662	1,063	318	
					+ 193			

When we now go on to a survey of hoards starting with centenionales, i.e. *Victoriae*, we can note some hoard structures of a general kind. In this context these may be regarded as sufficient.

TABLE 5. - CHRONOLOGICAL STRUCTURE OF HOARDS OF LATE CONSTANTINIAN COINS.

Starting with		Ending with	
Time	Type	Time	Type
c. 320	VICTORIAE LAETAE	c. 330	PROVIDENTIAE
c. 320	Id.	c. 346	VICTORIAE DD
c. 324	PROVIDENTIAE	c. 346	Id.

Among the many hoards available, I have picked out the following nine, carefully published and adequately analyzed. Others could be added to cover the period up to A.D. 346 (or 348), Appleford and Fayoum, to mention two, but I have limited myself to the first hoard structure of table 5.

I will make just two points:

- (1) nummi are exceptional in these hoards, and
- (2) the centenionales, originally singled out as a special silver denomination by the much regretted Lawrence Cope, i.e. *Victoriae* and *Virtus exercit*, with the corresponding coins of the East, all with left turned consular busts, mix exceedingly well with the *Vota*, *Beata*, *Sarmatia*, *Providentiae*, and later with the *Gloria exercitus* coins. The analyses by

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Barrandon-Brenot-Callu⁵ show these coins to represent the same denomination containing about 2 per cent silver. They are, as John Kent has suggested, centenionales. It is, however, a different matter that, when the devaluations of this denomination start, the public is likely to react in the same way as to other coin deteriorations.

TABLE 6. - HOARDS WITH START IN THE VICTORIAE-ISSUES

Hoard	Number of coins	Early coins	Reverse types							Closing date
			Victoriae	Virtus exercit	Vota	Beata	Sarmatia	Providentia	Other	
Brentford	67			5	8	43	4	7		324 (327-8?)
Bulgaria	74		1	3	14			51	5	327 (331-2?)
+ Canterbury	106	1 ant.	11	8	16	65	6			324
Chavannes	1,037	2 Sol	30	48	370	242	83	287		326
+ Flavia Solva	636		39	88	492	4	7		6	324
Gullsfield	271		33	27	22	167	11	9		326
Nagytétény	10,585	11 num.	120	706	-		6,815	-	2,984	333 (331-2?)
Trouville C	84		5	4	19	25	11	20		327-8 (c. 330)
+ Warsop	341	1 Sol	2	13	66	80	31	139	9	c. 330

6. My final conclusion is very simple. I think it is evident that in a time of monetary instability such as the tetrarchic-Constantinian era, hoarding followed a pattern that could be defined as a corollary to Gresham's law. But the good coins did not go abroad, they went underground, carefully separated from suspicious currency. This conclusion should, however, have far-reaching consequences,

(1) for our evaluation of the hoard evidence. To underline a very special aspect: only under certain circumstances can hoards be regarded as evidence for the money in circulation (a mirror of all the coins in circulation).

(2) for the listing, analysis, and classification of the hoards.

LIST OF HOARD PUBLICATIONS REFERRED TO IN THE TABLES AND IN THE TEXT

The hoards are recorded in alphabetical order. The name of the author is given but, generally speaking, not the title of the individual article or paper (which normally follows the formula «A hoard of...», or «Trouville de ...»), but, of course, the journal, series with page references, or the monograph in question.

At times the picture of the contents of a hoard has been rectified by research carried out after the original publication of the hoard. Some such supplementary

5. J.N. BARRANDON, J.P. CALLU and Claude BRENOT, *The analysis of Constantinian coins (A.D. 313-340) by non-destructive californium 252 activation analysis*, in *Archaeometry*, 19, 1977, p. 173-186.

notes have been recorded in the list in conjunction with the hoard publication. Otherwise I would like to draw the attention to the critical comments in BASTIEN-HUVELIN, *Trouaille de folles de la période constantinienne (307-317) (Numismatique romaine, V)*, Wetteren, 1969, and to J.-P. CALLU, *La politique monétaire des empereurs romains de 238 à 311 (BEFAR, 214)*, Paris, 1969.

The following abbreviations have been employed in this bibliography:

- AC *Antiquité classique.*
 AIIN *Annali dell'Istituto Italiano di Numismatica.*
 ANS MN *American Numismatic Society Museum Notes.*
 BJ *Bonner Jahrbücher.*
 BSFN *Bulletin de la Société française de Numismatique.*
 CENB *Cercle d'Études numismatiques, Bulletin.*
 FMRD *Die Fundmünzen der römischen Zeit in Deutschland.*
 JNG *Jahrbuch für Numismatik und Geldgeschichte.*
 NC *Numismatic Chronicle.*
 NNM (American Numismatic Society) *Numismatic Notes and Monographs.*
 NumRom *Numismatique romaine, Wetteren.*
 NZ *Numismatische Zeitschrift.*
 RBN *Revue Belge de Numismatique.*
 RIN *Rivista Italiana di Numismatica.*
 RN *Revue numismatique.*
 SM *Schweizer Münzblätter.*
 ZfN *Zeitschrift für Numismatik.*

Aleppo. BASTIEN, *RN*, 1967, p. 166-208.

Ankara. KIENAST, *JNG*, XII, 1962, p. 65-112.

Antibes. GEORGE ROGERS, typescript to be published in a supplement to *Cahiers d'Archéologie subaquatique*, generously put at my disposal by the author.

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Bitbourg. NAMUR, *RBN*, 1859, p. 469-483.

Bliesmengen-Bolchen. KIENAST, *FMRD*, III, 1962, p. 218-246.

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Bourton-on-the-Water. BURGE, *NC*, 1973, p. 98-125 (I had the privilege of working on the original typescript, kindly put at my disposal by the author).

Bulgaria. OVERBECK, *Chiron*, 1971, p. 407-419.

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Patrick BRUUN
Furuvaegen, 32 B 2
20540 Turku 54
Finland

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