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C. H. V. Sutherland

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DENARIUS AND SESTERTIUS IN DIOCLETIAN'S COINAGE REFORM

By C. H. V. SUTHERLAND

Widely ranging arguments, and often equally wide perplexity, have now for a long time been aroused by the internal monetary problems of Diocletian's coinage reform, as a glance at any recent bibliography will show.¹ Two primary factors connected with the reform are now generally recognized: first, that gold and silver coins of the reformed series were marked with their weight as bullion by numerals which defined them as fractions, respectively, of the gold and silver pound ($\Sigma = 60$ on gold, and $\text{xcvi} = 96$ on silver),² and secondly that by A.D. 301, when Diocletian issued his Maximal Edict, the prices for an enormous variety of commodities were quoted in terms of the 'denarius communis', of which the Edict rating (which was, it should be emphasized, a maximum rating and by no means necessarily general) gave 50,000 as the price of a pound of gold.³ What has remained most in dispute is the denominational value of Diocletian's new large copper coin (with laureate head on obverse and *Genio Populi Romani* reverse, weighing about 10 gm.), now commonly termed the 'follis',⁴ and its relationship both downwards with the new and smaller radiate-obverse copper piece and upwards with the xcvi silver. Interpretations have varied very widely indeed, and the 10 gm. coin has been equated with as little as 2 'denarii communes' at one end of the scale⁵ and as much as 20⁶ or 25⁷ at the other.

In much of the recent discussion emphasis has been laid on the more purely economic⁸ or metrological⁹ aspects of the problem, to the exclusion of the simpler evidence furnished by the long, continuous tradition of the Imperial coinage itself—so important an element in judging public reaction at the time of the reform—combined with other essential documentary evidence. Chief among the points which demand clear recognition is the fact that, throughout the empire down to the end of the third century,¹⁰ the sestertius was a principal (even if not the only) unit of reckoning: fifty years after the silver denarius, regularly issued, had become a memory its quarter in value, the sestertius (initially so appropriate when, in Republican times based essentially on an *aes* standard, the silver denarius represented a high value), still retained its old place in monetary reckoning. Moreover, it is important to remember that the sestertius survived physically, as an actual coin, down to the third quarter of the third century,¹¹ even if its weight and module had often shown signs of monetary strain.¹² The sestertius, then, was a reckoning unit of great antiquity, and in use as such to the late third century, as well as being a denomination actually coined until nearly that time.

The denarius, regarded as a silver coin regularly issued in a predictable quality and size, virtually came to an end in 238.¹³ But the Maximal Edict of c. 301 shows that the denarius was then still known as a unit which, because it was the lowest in the scale, represented a denomination of very small value. That it was an actual coin cited by the

¹ See, for example, the works cited by H. Mattingly, 'Sestertius and Denarius under Aurelian,' *Num. Chron.* 1927, 219 ff., and 'The Monetary Systems of the Roman Empire from Diocletian to Theodosius I', *Num. Chron.* 1946, 111 ff.; L. C. West, 'The Coinage of Diocletian and the Edict on Prices,' in *Studies in Roman Economic and Social History in honor of Allan Chester Johnson* (ed. P. R. Coleman-Norton, Princeton, 1951), 290 ff.; and S. Bolin, *State and Currency in the Roman Empire to 300 A.D.* (Stockholm, 1958), 291 ff.

² Not all the reformed gold and silver was so marked, though uniformity of weight throughout shows that it might have been, if required: see K. Pink's two valuable articles in *Num. Zeitschr.* 1930, 9 ff., and 1931, 1 ff.

³ cf. West, o.c. 290.

⁴ Acceptance of this name, which properly belongs to a later period, is no more than a reflection of the uncertainty about its denominational value. It would be well to dissociate it altogether from Diocletian's new coinage.

⁵ H. Mattingly, *Roman Coins*², 218.

⁶ H. Mattingly, *Roman Coins*¹, 226.

⁷ A. H. M. Jones, 'Inflation under the Roman Empire,' *Economic History Review* 1953, 293 ff., esp. 299.

⁸ Jones, o.c.

⁹ B. Hilliger, 'Der Pseudoantoninianus Aurelians und die Münzreform Diocletians,' *Deutsches Jahrb. f. Numismatik* 1939, 102 ff. The theories offered by Hilliger would presuppose an understanding of weight-systems and metal-ratios, on the part of the subjects of the Roman empire at large, as acute and learned as that which he himself displayed; and it is beyond belief that this was possible.

¹⁰ See, e.g. Jones, o.c., 306.

¹¹ *Roman Imperial Coinage* (ed. H. Mattingly, E. A. Sydenham) v, pt. 1.

¹² Thus Trajan Decius issued his well-known double sestertius, with radiate head, as his heaviest *aes* unit (*Rom. Imp. Coinage* iv, pt. 3, 135 f.).

¹³ Id., *Introd.*, xxii.

Edict and not a mere reckoning unit is demonstrated by the term 'denarius communis', in which the adjective incidentally suggests the degree of debasement which separated this unit from its earlier silver predecessor. We have arrived, consequently, at the following position: the sestertius survived as a reckoning unit until the late third century and the denarius, debased to a new and 'common' form, is alive at the end of the third century. As a result we might postulate, not unreasonably, a sestertius-denarius relationship—a fact already seen by Mattingly¹⁴ and glimpsed by Jones.¹⁵

Caracalla's inflationary reform of the coinage had produced a double denarius¹⁶ which, because its silver content was substantial,¹⁷ could still command acceptance. Gallienus' double denarius dropped to about 5 per cent or less of silver: that of the Gallic emperors to 1 per cent or even less.¹⁸ The denarius, therefore, as a unit of reckoning, must at this time have sunk to a negligible, or at any rate minimal, value; and such economic stability as remained at all must have been based on gold alone. For this reason I find it impossible to believe that, when Aurelian reformed the coinage and introduced a new and silver-washed¹⁹ radiate-head coin, he was reviving the double denarius. Its debasement under Gallienus was so great that it could never have been revived, even in an only slightly less debased form; and since the ancients (doubtless because of the absence of Arabic numerals) seem never to have conceived of the modern usage of 'knocking off the noughts' in monetary reform—as in France in 1960—their coins always sank sharply in denominational value,²⁰ or in weight, or both. It is difficult to avoid the conclusion that Aurelian's new radiate-head coin was still so inflated as to make it necessary to express its value in terms lower than that of denarii, in order to soften the sense of shock to the public;²¹ and, in view of long and binding tradition, the only possible expression was in terms of sestertii.

These new radiates bear marks which are almost universally²² agreed to be marks of denominational value—in Latin form *xx*.I or *xxi*,²³ and in Greek *KA*: at Ticinum the form *xx* appears. This last mark is overwhelming evidence that in the forms *xxi* and *KA* we are dealing with an equation ($x = y$), and not with a simple total of 21.²⁴ And the dotted form *xx*.I shows what that equation must be, namely, $20 = 1$, for it is inconceivable at this stage of Roman monetary history that *xx* can mean '2 denarii', for which the correct notation for centuries had been *xx*.²⁵ The Latin *xx*, in fact, means '20', and the equation as a whole says ' $20 x = 1 y$ '. If reckoning by denarii and sestertii was still normal, as has been argued above, and if Aurelian did not wish (because he thought it impolitic) openly to call his new radiate, successor to the double denarius, a five-denarius piece he could at least declare its value at 20 sestertii—the immemorial equivalence of 5 denarii,²⁶ thus following the long tradition of marking a given coin in denominational terms of a unit below it.²⁷ Both sestertius and denarius, as actual coins, had disappeared, but their old relationship in reckoning survived²⁸ and thus helped to conceal a continuing inflation which, though less disastrous than that of Gallienus, was nevertheless still serious.

¹⁴ *Num. Chron.* 1927, 223 ff. (though in an inverted and unacceptable form).

¹⁵ o.c. (n. 17) 297 f.

¹⁶ Imperial monetary tradition from early times had made a radiate head indicate a double denomination (cf. the early imperial dupondius, Trajan Decius' double sestertius, and even 'double multiples' in gold in the early fourth century). It has often been held that Caracalla's new radiate piece = $1\frac{1}{2}$ denarii (so Hilliger, o.c. (n. 9) 103); but this view is not acceptable in the light of a contrary tradition.

¹⁷ J. Hammer, 'Der Feingehalt der griechischen und römischen Münzen,' *Zeitschr. f. Num.* 1908, 102 f.: his figures (which urgently need amplification) suggest a fineness of over 50 per cent.

¹⁸ Hammer, o.c. 105 f.

¹⁹ Fineness was up to 5 per cent; cf. Hammer, o.c. 107; Hilliger, o.c. 104.

²⁰ Thus the early Republican denarius of 10 asses was soon tariffed at 16 (its mark changing from *x* to *æ*).

²¹ Whether public unrest is veiled behind the shadowy tradition of trouble at the mint of Rome

under Aurelian it is impossible to say: cf. Mattingly, *Num. Chron.* 1927, 219.

²² See below for the views of Brambach and Bolin.

²³ The dotted form occurs at Siscia and Serdica.

²⁴ As Hilliger, o.c. 105 f.

²⁵ cf. Mattingly, *Num. Chron.* 1927, 221, in the course of a valuable passage on the possible interpretations of the equation formula.

²⁶ This explanation of the *xxi* coinage, '1 piece = 20 sestertii (= 5 denarii)' was put forward by W. Kubitschek in *Jahresberichte 1894-5, 1895-6, des k. k. Staatsgymnasiums im VIII. Bezirke Wiens*, 86 ff., and by G. Mickwitz, *Geld und Wirtschaft im röm. Reich des vierten Jhdts. n. Chr.* (Helsingfors, 1931), 62 ff.; see also Jones, o.c. 297 f.

²⁷ cf. early Republican *aes* marked in unciae, and silver in asses, besides Neronian dupondii marked in asses.

²⁸ There are no longer 240 silver pennies to the English lb. of sterling silver, though 240 pennies are still reckoned to the £.

Diocletian, as was noted above, marked his reformed gold and silver coins with their weight as fractions of the gold and silver pound, and not as containing a given number of lower denominational units: they were, essentially, pieces of bullion, and as such their intrinsic value must be free to shift in sympathy with the bullion market. But his reformed *aes*, of course, was not so marked. It consisted mainly, as we have already seen, of two kinds of coin. One, with laureate head and initially *Genio Populi Romani* reverse, weighed about 10 gm., and was marked at Siscia and Alexandria with the sign XXI or XX I: there was a silver content of 2–3 per cent.²⁹ The other, with radiate head, weighed about 3 gm., bore no mark of value, and contained traces of silver so small as to be quite certainly accidental.³⁰ Bolin,³¹ following Brambach,³² and arguing on grounds of metal content and the ratio of metal values, has now put forward the firm view that the 10 gm. XXI coins are so marked because they contain 20 parts of copper to 1 part of silver, and that they are to be regarded as pieces of 5 ‘denarii communes’, the smaller radiate coins being pieces of 2 ‘denarii communes’.

It may well be doubted, however, if Bolin’s interpretation of Diocletian’s XXI coins is really probable or natural. The mark had begun under Aurelian, and if it had a denominational significance under Aurelian it must surely have a denominational significance under Diocletian: in other words, there must have been some parallelism of usage.³³ It is, in any case, very difficult indeed to concede that the formula XXI (or XX I) would have been at all readily understood, even among an educated minority, as referring to the alloy ratio; and in fact these 10 gm. coins were (as their vast numbers even to-day show clearly) issued as everyday currency for everyman, for whom the denominational value of a coin—especially an almost wholly copper coin—was surely of greater importance than its exact ratio of alloy. The mark XXI, if it signified ‘1 piece of 20 sestertii’ under Aurelian, signified the same under Diocletian, whose 10 gm. coin was thus (as often conjectured before now)³⁴ a five-denarius piece. Brambach and Bolin have doubtless reconstructed correctly the economic and intrinsic basis of this valuation in denarii, but XXI can scarcely have called attention to that basis.

By the time of Diocletian’s reform, therefore, the once silver denarius has become the ‘denarius communis’ of pure or almost pure copper—pure copper in the new radiate-head coin which, like the pre-Aurelianic radiates, was a two-denarius piece, and almost pure copper in the new XXI coin, which continued the denominational rating of Aurelian’s XXI radiate and was equivalent to 20 sestertii = 5 denarii:³⁵ the existence of such units has indeed been predicated from the frequent divisibility by 5 and 2 of prices mentioned in the Maximal Edict.³⁶ It is likely that the valuation of Diocletian’s new coins as a whole must have caused local or temporary uncertainties: ⚡ on the gold appeared only at Thessalonica and Antioch, xcvī on the silver only at Rome, Ticinum and Aquileia, and XXI on the 10 gm. coins (as already noted above) only at Siscia and Alexandria, in the latter of which mints there had in any case been a change from a Greek-inscribed and Greek-valued coinage to a Roman one. And there were, perhaps, mistakes of another kind: was it, for example, in misinterpretation of the general order to produce the new radiate coppers of 2 denarii that Cyzicus alone struck the very rare radiate $\pm 5\frac{1}{2}$ gm. pieces with *Concordia Militum* reverse—a reverse which otherwise appears exclusively on the 3 gm. coin at all mints?³⁷ Moreover, once the new copper 3 gm. radiate was introduced at a rate of 2 denarii Aurelian’s XXI radiate of 5 denarii was presumably exchanged only at the 2-denarius rate: this would have been a severe shock to holders of the Aurelianic piece and might well have

²⁹ Hammer, o.c. (note 17), 137. I hope to be able to publish in due course the analysis of many more examples.

³⁰ Hammer, o.c. 137.

³¹ o.c. (note 1), 302 ff.

³² ‘Beiträge zur röm. Münzkunde,’ *Frankfurter Münzzeitung* 1920, 204 f., rejected by Mattingly, *Num. Chron.* 1927, 221, on grounds that probably need further investigation: see n. 29 above.

³³ This is generally accepted by most scholars, including Hilliger, o.c. (note 9), 112.

³⁴ See n. 26 above.

³⁵ Hammer in 1908 (o.c. 137) was already calling them ‘fivers’ and ‘twos’.

³⁶ Bolin, o.c. 302. The arguments put forward by West, o.c. (note 1), 294 ff., on the basis of the actual number of coins necessary to pay prices mentioned in the Edict are not wholly convincing: the reform was a reform of values, and not of social usage.

³⁷ O. Voetter, *Die Münzen der röm. Kaiser, Kaiserinnen und Caesaren von Diocletianus bis Romulus: Katalog Paul Gerin* (Vienna, 1921), 133 (Herculius), no. 10 and (Constantius), no. 4; 134, (Galerius) no. 4. The two first of these coins are in the Vienna collection.

led to an agonized desire to get rid of Aurelian's coins, of the kind evident in the Rylands papyrus.³⁸

How long did the system last by which Diocletian's two major *aes* denominations were valued respectively at 5 and 2 denarii? It was, presumably, introduced with the introduction of the new 10 gm. coin itself, i.e. c. A.D. 294; ³⁹ and it may be supposed that the appearance of the Maximal Edict in 301 was a reflection of new monetary strains that had already become apparent—leading, incidentally, at certain western and central mints to the momentary abandonment of the *Genio Populi Romani* reverse on the 10 gm. coins in favour of one or another of a number of variants upon *Moneta Sacra Augg et Caess Nn.*⁴⁰ From c. 307 the formerly \pm 10 gm. piece in the western mints dropped sharply in weight to \pm 6.5 gm., followed by similar reduction elsewhere, and by c. 310 stood even lower at \pm 4.5 gm.⁴¹ It would be natural to expect that changes in the value of the initially 5-denarius piece would have taken place in the period from 305 to 310 and this may well have been the case: the hitherto unexplained formulae CI $\frac{H}{S}$ and CMH, the former on *aes* of Lyons, the latter on *aes* of Nicomedia and Cyzicus,⁴² may have called attention to such change. But these are later problems, which lie outside the scope of the present note: it is enough here to have demonstrated that the earlier recognition of Diocletian's main laureate and radiate coins as pieces respectively of five and two denarii must be correct almost beyond the possibility of doubt. The maximum price which he set upon a pound of gold in 301 was 50,000 'denarii communes'. This could have been paid in 10,000 10 gm. coins or 25,000 3 gm. coins.⁴³

³⁸ C. H. Roberts and J. G. Milne, 'ΙΤΑΛΙΚΟΝ ΝΟΜΙΣΜΑ', *Trans. Intern. Num. Congress 1936*, 246 ff. The drop in value from 5 to 2 denarii is near enough to the εἰς ἡμισὺ νόμισμον καταβασθῆναι of the papyrus, the phrase meaning (see Roberts and Milne, o.c. 249, n. 1) 'to the half of the value in the case of each coin'.

³⁹ C. H. V. Sutherland, 'Diocletian's Reform of the Coinage: a Chronological Note,' *JRS* 1955, 116 ff.

⁴⁰ See, e.g. Voetter, o.c. (n. 37) 59 ff., 214 ff. 276 ff., 316 ff., 359 ff.

⁴¹ cf. J. P. C. Kent, 'The Pattern of Bronze Coinage under Constantine I,' *Num. Chron.* 1957, 16 ff.

⁴² Kent, o.c. 42 f., 66 ff.

⁴³ Certain other problems of Diocletianic date remain. The relationship of the new silver coin to both gold and *aes* is difficult (cf. Bolin, o.c. 294 ff., 302 ff.). So too is the attribution of denarial values to what have until now been called halves, quarters and eighths of the follis (see, e.g. P. Strauss, 'Les monnaies divisionnaires de Trèves,' *Rev. Num.* 1954, 33 ff.), given up substantially to 'vota' types. Their metal-composition has not yet been analysed, but if they are all devoid of silver the 'halves' may be pieces of 2 denarii, the 'quarters' of 1 (a physical expression of the 'denarius communis'), and the 'eighths' of $\frac{1}{2}$ denarius.