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THE
ROMAN MONETARY SYSTEM

E. A. SYDENHAM

PART II

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THE ROMAN MONETARY SYSTEM.

PART II.

§ 10. *The Augustan System.*

IN the preceding section¹ we considered the constitution of the orichalcum and copper factors of the Augustan system. With respect to the more precious metals Pliny's statement that, in the time of Augustus, the *aureus* was struck at $\frac{1}{42}$ of a pound (= 120.3 grs.) and the *denarius* at $\frac{1}{84}$ (= 60.15 grs.) is pretty generally accepted.

If, however, as may reasonably be supposed, the weight of each *aureus* and *denarius* was tested separately, it appears probable that the normal standard of the coins was 7 and $3\frac{1}{2}$ scripula respectively, or 122.7 and 61.39 grs., which approximates fairly closely to Pliny's $\frac{1}{42}$ and $\frac{1}{84}$. This standard remained unchanged from B.C. 14 to A.D. 63.

That the *denarius* of Augustus was issued normally at 20 siliquae (= 58.4 grs.), as has been suggested, which implies, moreover, that the weight of the *aureus* would be 40 siliquae (= 116.8 grs.), is obviously too low an estimate. The gold coins of the early Empire are remarkably consistent in their weight and considerable care appears to have been taken to ensure accuracy in this respect. Moreover, the average weight

¹ *Num. Chron.*, 1918, pp. 155-86.

of the coins certainly indicates a rather heavier standard; thus six finely preserved *aurei* of Augustus give an average of 121.35 grs., and seventeen equally fine *denarii*, issued after B.C. 20, an average of 59.8 grs. The normal weight, as a general rule, may be expected to be slightly in excess of the average; therefore there appears some justification for the conclusion that the *aureus* and *denarius* of Augustus weighed respectively 7 and $3\frac{1}{2}$ scripula.

The ratio of gold to silver was thus 12.5 to 1.

The metal composing the *denarii* of Augustus is, as regards quality, the finest that occurs under the Empire: J. Hammer's analysis showing as high a proportion as 0.99 of pure silver.²

The monetary system instituted by Augustus, comprising eight denominations which formed the basis of the Roman coinage down to the time of Gallienus, may be summarized as follows:—

		Normal Weights.			
Gold	Aureus	7	scripula = 122.7	grs. = 7.96	gms.
	Quinarius aureus	$3\frac{1}{2}$	" = 61.39	" = 3.98	"
Silver	Denarius	$3\frac{1}{2}$	" = 61.39	" = 3.98	"
	Quinarius argenteus	$1\frac{3}{4}$	" = 30.69	" = 1.98	"
Orichalcum	Sestertius	24	" = 421.0	" = 27.25	"
	Dupondius	12	" = 210.5	" = 13.6	"
Copper	As	10	" = 175.5	" = 11.3	"
	Quadrans	$2\frac{1}{2}$	" = 44.0	" = 2.9	"

§ 11. *Changes in the Augustan System.*

We now pass on to notice the changes that occurred in the course of this period of over two and a half centuries and the various attempts, made from time to time, to readjust the coinage in order to stave off the inevitable disintegration of the system.

² "Der Feingehalt der griechischen und römischen Münzen" *Zeit. für Num.*, 1907, vol. xxvi, p. 95.

These changes are mainly of three kinds: (1) the addition of new denominations or new forms of existing denominations, the duration of their currency being in some cases limited to a few years, while in others it is extended to nearly a century; (2) the temporary or permanent discontinuance of certain denominations; (3) the tendency towards depreciation, which is especially conspicuous in the third century, by the reduction in the weight of the gold and bronze and by the increase of the alloy in the silver.

It may be stated generally that throughout this period gold and silver *quinarii* appear to have been issued somewhat irregularly and never in very large quantities. This also applies to some extent to the smaller denominations of orichalcum and copper.

The first new species of coin, in addition to the four senatorial denominations of Augustus, was introduced by the moneyers, P. Lurius Agrippa, M. Maecilius Tullus, and M. Salvius Otho, who appear to have held joint office as triumviri in B.C. 5. Besides *dupondii* and *asses* of the usual types, these moneyers issued a series of coins of larger module bearing on the obverse the striking device of the head of Augustus crowned by a full-length figure of Victory.

These coins, which have been variously described as *sestertii* by Mr. Grueber,³ as "triumphal" *asses* by Willers and Laffranchi,⁴ or as *dupondii* by Mr. Walters,⁵ appear to have been issued at a weight standard of normally about 350 grs.⁶

³ *Num. Chron.*, 1904, p. 232.

⁴ *Riv. it.*, 1914, p. 327.

⁵ *Num. Chron.*, 1915, p. 326.

⁶ Actual weights of specimens are (in grains): P. Agrippa, 271.0; M. Tullus, 381.3, 360.6; M. Otho, 330.5, 275.4, 258.0.

The metal of which they are composed is apparently pure, or almost pure, copper—a fact that in itself entirely disposes of the view that the coins are *sestertii*. On the other hand, their weight demonstrates clearly that they cannot be *asses*. Thus there seems little reason to doubt that we are justified in accepting Mr. Walters's suggestion that these remarkable coins are copper *dupondii*.

It seems to have been the unwritten rule in early days that the emperor's portrait was placed on no senatorial coin other than the *as*, and this rule was observed until about the year A.D. 22. These unusual coins struck by the moneyers of B.C. 5, therefore, form the only exceptions; and their issue must be regarded as extraordinary, since it establishes no precedent and was of brief duration.

Of more importance, on account of its greater permanence as a factor of the monetary system, was the introduction of the brass (orichalcum) *semis*. This denomination was not issued by any of the moneyers who controlled the senatorial mint down to B.C. 3, but appears in the following year at the provincial mint of Lugdunum.⁷ Its introduction under the auspices of the emperor, or the Concilium Galliarum, was possibly with a view to improving the scheme of the brass and copper coinage, by bringing the denominational values into more regular sequence. Thus the provincial coinage of Lugdunum, consisting of *sestertius*, *dupondius*, *as*, and *semis*, represented in terms of the *as*, 4, 2, 1, and $\frac{1}{2}$, as contrasted with the senatorial *sestertius*, *dupondius*, *as*, and *quadrans* or 4, 2, 1, and $\frac{1}{4}$.

⁷ Cf. "The Mint of Lugdunum", *Num. Chron.*, 1917, p. 74.

Although the Lugdunum sequence has much to commend it from a practical point of view, it does not appear to have been adopted by the Roman mint, and the *semis* finds no place in the senatorial coinage until it is included in the elaborate reform of Nero, A.D. 63.

The orichalcum, or brass, *semisses* of Augustus and Tiberius bear but one reverse type, namely that of the *Altar of Lugdunum*, and their issue ceases about the year A.D. 21, when the provincial mint of Lugdunum was closed for the issue of brass and copper.

Two modifications of the Augustan system occur during the reign of Tiberius: (1) the copper *quadrantes* were discontinued, and (2) *dupondii* were issued according to two standards of weight.

The former calls for little comment, since the issue of small copper money fluctuates considerably under the earlier emperors. But this somewhat curious feature respecting the weight of the *dupondius* undoubtedly has an important bearing on the monetary principles of the period.

There is practically no question that the weight of the *dupondius*, as originally determined under Augustus, was half an ounce (210.5 grs.). The senatorial *dupondii* of the moneyers (B.C. 18-3), though subject to a good deal of variation, work out at this amount on the aggregate, and the imperial *dupondii* of Lugdunum (B.C. 2-A.D. 21) correspond fairly consistently with this weight. About the year A.D. 22, however, we find *dupondii* issued at a heavier standard of about 250 grs.⁸ These heavier coins did not supersede the lighter ones, but were issued along with them. More-

⁸ Specimens not infrequently weigh as much as 280 grs.

over, they present no distinction in type, so that we find many examples of *dupondii*, identical as regards type and legend, issued at both weights (e.g. *dupondii* of Antonia, Nero et Drusus Caesares, &c.).

It is perhaps obvious to raise the question whether this variation in weight may not be the result of mere accident or inaccuracy in casting the flans. It is well known that Roman coin-weights were frequently erratic, but, in the case of the *dupondii* of this period, the tendency to exceed half an ounce is in many specimens so marked that it appears practically certain that they were intended to conform to a heavier standard. On the other hand, the lighter *dupondii* generally fall short of half an ounce.

This feature is unmistakable in the *dupondii* issued during the latter part of Tiberius's reign and during the reigns of Caligula and Claudius. It is not without significance too that, under the last two emperors, the *sestertius* weighs almost invariably more than an ounce, and frequently as much as 470 grs.; whereas, throughout the period, there is no corresponding appreciation in the weight of the *as*.

Taking these points in connexion with one another it seems possible to arrive at some explanation of the increase in the weight of the *dupondius*. It has already been pointed out that orichalcum was reckoned in currency at about one and two-thirds the value of copper.⁹ This certainly appears to have been the ratio between the two metals at the time that orichalcum coins were introduced by Augustus, so that the *dupondius* of orichalcum, weighing 210.5 grs., was

⁹ Cf. "The Roman Monetary System", Part I, *Num. Chron.*, 1918, pp. 182 ff.

twice the value of the copper *as*, weighing 175.5 grs. That is to say, the *dupondius* was one-fifth heavier than the *as*.

Under Caligula and Claudius the component factors of orichalcum, *i.e.* copper and zinc, occur in almost exact proportions of 4 to 1, thus producing orichalcum of the finest quality.¹⁰ But what was the result? Evidently that the intrinsic value of orichalcum relatively to that of pure copper was found not to be as great as that assigned to it by Augustus. Consequently it became necessary to add weight to the alloyed coins in order to preserve the standard of the *as*.

Although this hypothesis accounts for the issue of the heavier *dupondii*, it does not explain the persistence in certain cases of the older half-ounce standard. It is probable, however, that the commercial value of orichalcum tended to fluctuate so that in the issue of light *dupondii* we may discern sundry attempts—apparently unsuccessful—to maintain it at its original status. Further, we may well imagine that this shifting of the ratio between orichalcum and copper goes some way towards explaining why no orichalcum coins were struck during the earlier part of Nero's reign, and why in the year A.D. 63 the senatorial coinage was entirely readjusted on an orichalcum basis.

In attempting to discover the normal or theoretical weight of the heavy *dupondius*, issued between A.D. 22 and 54, a difficulty arises from the fact that we possess no independent evidence as to the extent to which orichalcum had depreciated in relation to copper.

¹⁰ See Appendix, Table II, abridged from Hammer's analysis.

We depend mainly, therefore, on the average weight of the coins. This, as we have stated, works out at about 250 grs., which indicates that the ratio between the metals stood at about one and one-third to one. That is to say, since the two *asses* of copper weighed 350 grs., it follows that an equivalent value of orichalcum would weigh 252·5 grs., or one-twentieth of a Roman pound, which was not improbably the normal weight of the heavy *dupondius*.

On the other hand, we cannot overlook the possibility that the weight of these coins may not have been definitely fixed; and, provided they contained a greater amount of orichalcum than the *dupondii* of the Augustan standard, their precise weight may have been left to the caprice or discretion of the coiners.

§ 12. *The Neronian Reform, A.D. 63.*¹¹

During the first nine years of Nero's reign a somewhat unusual state of affairs prevailed in connexion with the Roman mint, inasmuch as the issue of gold and silver, which since the time of Augustus had belonged exclusively to the imperial mint, was now relegated to the senatorial.¹² It seems probable, moreover, that no coins of orichalcum or copper were issued

¹¹ Having attempted to deal with various aspects of Nero's coinage and the important reform of A. D. 63 in the *Num. Chron.*, 1916, pp. 13-36, I shall not repeat what I have already said further than is necessary to make the subject intelligible. There are, however, one or two supplementary points to which I wish more particularly to call attention in the present section.

¹² This seems a fair inference from the invariable occurrence of **EX·S·C** on the *aurei* and *denarii* issued A. D. 54-63. However, Mr. Mattingly has suggested a somewhat different explanation. (See "Mints of the Early Empire" in *Journ. Rom. Studies*, vol. vii.)

prior to the year A.D. 60; and it is not until after the réform of A.D. 63 that the great Neronian coinage in these metals really begins.

This temporary closing of the senatorial mint for the issue of brass and copper coins was not without precedent in the monetary history of Rome. From B.C. 82 to 23 there had been an almost total cessation of the bronze coinage, and a similar lacuna had occurred between B.C. 3 and A.D. 11.

Down to the year A.D. 63 the gold and silver coins were maintained at about the same standard of weight and purity as that adopted in B.C. 15. But in A.D. 63 Nero reduced the weight of the *aureus* to $6\frac{1}{2}$ scripula (113.75 grs.) and that of the *denarius* to 3 scripula (52.64 grs.), or respectively to $\frac{1}{45}$ and $\frac{1}{95}$ of a pound.¹³ At the same time the amount of alloy in the silver was increased to about 10 per cent.

It may be noted in passing that, although the *denarius* suffered considerably from debasement under subsequent emperors, no further reduction seems to have been made in its normal weight as long as it continued to be a regular factor of the currency.

I have elsewhere enumerated various reasons that have been urged in explanation of the reduction of the gold and silver coins under Nero. There seems no question, however, that the reduction in the case of the *aureus* and *denarius* is inseparably associated with the readjustment of the orichalcum and copper coinage.

Orichalcum, as we have seen, tended to depreciate relatively to copper, whereas copper seems to have maintained its relative value to gold and silver. The

¹³ Pliny, *N. H.*, xxiii. 3 (13).

difficulty was met during the reigns of Caligula and Claudius, as we have seen, by the issue of *sestertii* and *dupondii* at an increased weight. Whether or not this device proved unsatisfactory does not transpire, but it is certain that during the earlier part of Nero's reign the coinage of orichalcum was abandoned.

Between A.D. 60 and 63 there appears to have been a limited output of copper *asses*, *semisses*, and *quadrantes* and possibly a few *dupondii*. But as time went on the need of a regular and more plentiful supply of orichalcum and copper became daily more pressing. Thus the senatorial mint was again confronted with the problem of how to deal with the fluctuating value of orichalcum in relation to the other metals without upsetting the traditional imperial system.

The solution hit upon by Nero's mint-masters was to issue coins of all denominations, from the *sestertius* downwards, in orichalcum, adding to those already in common use the *as*, *semis*, and *quadrans*.

It was doubtless the intention of the framers of this policy that the three smaller denominations of orichalcum should supersede the copper coins already in use, although the latter could not immediately be withdrawn from circulation. As regards the *semis* and *quadrans* the plan seems to have been successful, and after A.D. 65 these denominations were issued in orichalcum only. But the brass *asses*, of which there are only three types, were evidently struck for only a short period, and, either to preserve the traditional aspect of the coinage or to facilitate international exchange, a speedy return was made to the *asses* of copper.

Thus it will be seen that the two metals ceased to be interdependent. The orichalcum coins formed a complete system by themselves and the copper could pass as money of convenience.

A possible and perfectly logical course of action would have been to have definitely raised the weight of the *sestertius* from $\frac{1}{12}$ to $\frac{1}{10}$ of a pound, making it, that is to say, normally twice the weight of the *dupondius*. This, however, does not seem to have been attempted seriously, and although examples of Nero's *sestertii* are occasionally found to scale as much as 500 grs.,¹⁴ their comparative rarity, combined with the fact that specimens in the finest state of preservation frequently fall considerably below 421 grs., points to the conclusion that the traditional weight of an ounce was nominally retained for the *sestertius*, while the standard of orichalcum was regulated by the *dupondius* of normally $\frac{1}{20}$ lb.

It was probably mainly on grounds of economy that the heavier standard of $\frac{1}{10}$ lb. was not adopted for the *sestertius*; but that its weight frequently exceeds an ounce is not difficult to explain, since, in consequence of the depreciation of orichalcum, it was eminently politic to issue the coins above, rather than below, the nominal weight.

The maintenance of a high orichalcum standard and the slight reduction in that of the gold and silver brought the three metals into harmony. But since pure copper appears to have retained its original relation to gold and silver, the reduction in the weight of the *aureus* and *denarius* necessitated a slight

¹⁴ An unusually heavy *sestertius* of the "Port of Ostia" type weighs 536 grs.

diminution in the weight of the *as*. Thus the copper *as* appears to have been issued at 168.4 grs. or $\frac{1}{30}$ of a pound.

The monetary reform of A.D. 63 was an undertaking of a bold and elaborate character, and Nero's reformed coinage has been not inaptly described by M. Soutzo as the most important monetary system of antiquity.¹⁵ Certainly it presented the most complete gradation of denominational values ever current at the same time. In its practical result, however, it is impossible to regard it as other than an interesting experiment. Meritorious as it undoubtedly was in theory, it came to an abrupt termination at Nero's death, and no attempt to revive it in its entirety was made by any of his successors in the Principate.

The weights of Nero's reformed coinage may be tabulated as follows:—

		Number of coins to the pound.	Normal weight.		Average weight in Grs.
			Grs.	Grms.	
Gold	Aureus	45	113.75	7.27	
	Quinareus aureus	90	56.87	3.635	
Silver	Denarius	96	52.64	3.41	
	Quinarius argenteus	192	26.32	1.70	
	Sestertius	12	421.0	27.28	420.0 (50)
Orichalcum	Dupondius	20	252.6	16.37	232.7 (30)
	As	40	126.3	8.185	125.5 (6)
	Semis	80	63.15	4.09	57.7 (13)
	Quadrans	160	31.5	2.045	33.5 (6)
Copper	As	30	168.4	10.91	166.9 (27)
	Semis	60	84.2	5.45	86.8 (10)
	Quadrans ¹⁶	120	42.1	2.72	53.1 (3)

§ 13. *The Readjustment of the Coinage after Nero.*

The reign of Galba is remarkable amongst other things for the prolific output of coins from the imperial

¹⁵ *Rev. Num.*, 1898, p. 659.

¹⁶ Some uncertainty exists as to the normal weight of the smallest denominations of brass and copper.

and senatorial mints. In fact there is probably no period of similar duration (barely seven months) in the history of the Roman coinage when coins were produced in so great number or with so many varieties of type. The result seems to have been rather an over-production of specie, at any rate as regards brass and copper; consequently, from the death of Galba, January 15, A.D. 69, until the late autumn of the same year the senatorial mint appears to have taken a complete rest. This incidentally explains the non-existence of bronze coins of Otho and the comparative rarity of those of Vitellius.

The point of main importance, however, so far as our present consideration is concerned, is the change in the monetary system that took place after the death of Nero. The elaborate brass and copper system, introduced in A.D. 63, disappears, and Galba's coinage returns to a modified form of the Augustan system, consisting of only three denominations, viz. *sestertius*, *dupondius*, and *as*. Further, it is evident from the coins that the brass, or orichalcum, pieces were no longer issued at the heavier standard. The *sestertius* seldom weighs more than an ounce (421.0 grs.) and the *dupondius* reverts to its original weight of half an ounce (210.5 grs.) No change appears to have been made in the weight of the *as*; and the *aureus*, *denarius*, and *quinarius* (A and R) continue in accordance with the Neronian standard, with the exception of certain *aurei* issued at Tarraco (av. wt. 117 grs.).

Thus the coinage of the Empire settled down to the form that became stereotyped under the régime of the Flavians and Antonines, and, in spite of the growing corruption that eventually undermined both

the fabric and credit of the currency, this form lasted in theory down to the time of Gallienus.

The dominant factors of the system are the *denarius* and *sestertius*; and, judging from the profusion in which these coins were issued from the time of Vespasian onwards, we may infer that they constituted the principal medium of exchange. The weight of the *sestertius* remained more or less steady until the reign of Commodus, its average being highest under Antoninus Pius.

Gold and silver *quinarii* were issued in small quantities and they seem to have been used mainly for donative purposes.

The fractions of the *as*, i.e. *semisses* and *quadrantes*, occur more or less continuously between the reigns of Vespasian and Commodus, although they exhibit considerable variation in the matter of weight.

Under Trajan the average weight of the *semis* (orichalcum) is 50.36 grs.; that is to say, it probably conforms to the Neronian standard. Under Hadrian it appears to be somewhat heavier, and shows an average of 68.0 grs. Its weight falls, however, during the reigns of Antoninus Pius and M. Aurelius.

Vespasian struck *quadrantes* of orichalcum and copper, although rather curiously the same weight standard and the same types appear to have been used for coins of either metal. From Domitian to Trajan copper *quadrantes* were issued at an average weight of 41.49 grs., while under Hadrian the *quadrans* appears to have been struck in orichalcum only, with an average weight of 37.7 grs. Thus, Hadrian's standard of both *semis* and *quadrans* appears to have been slightly in excess of the Neronian.

A series of small brass and copper coins, frequently described incorrectly as "tesserae", belongs in all probability to the period from Domitian to Hadrian. The obverse type is the head of a divinity such as Mars, Venus, or Mercurius, with a corresponding reverse type as a cuirass, dove, or caduceus. The coins are without legends, but the S·C· found invariably on the reverse denotes that they are of senatorial mintage and consequently should be regarded as factors of the monetary system. Thus, in spite of their erratic weights, they are probably *semisses* and *quadrantes*, and it may be conjectured that they were issued for distribution among the populace on public festivals.¹⁷

§ 14. *The Decline of the Augustan System.*

Under the Flavians and Antonines the weight, style, and metallic purity of the coinage were maintained more or less consistently. It is during the latter part of the reign of Commodus that the signs of decadence first became conspicuous by the inequality of his coins in the points mentioned, and by the sudden restriction in the issue of gold. From the death of Commodus the tendency grows apace and deterioration is observed in every species of coin. The gold began to be issued at erratic weights; the silver became more and more debased and, after the reign of Gordian III, practically ceased; the bronze dwindled in size and gradually lost the fine quality it possessed under the earlier emperors.

Such attempts as were made to resuscitate the

¹⁷ Some coins of smaller size than the *quadrans* may possibly be *sextantes* or *unciae*.

coinage by Caracalla, Alexander Severus, or Decius, were attended with ill success, and, in their results, tended for the most part to add confusion to a system that was fast becoming unintelligible. The unwieldy size of the Empire, a succession of incapable or avaricious rulers, the increasing demands for military payments, alike contributed to the difficulty of maintaining the credit of the currency. Disaster was inevitable; and the reign of Gallienus witnesses to the *débâcle* of the once splendid coinage of Imperial Rome.

The general decadence that pervades the coinage of the third century is not easy to analyse, nor does it appear possible to discover any regular gradation in its progress. Chaos resulting in collapse is perhaps the most accurate description of the coinage of the period.

Before entering upon a detailed consideration of the more salient aspects of the decline or attempted revivals of the coinage, it is important to note that the key to the whole chapter of disaster lies in the debasement of the silver coinage.

Silver obviously presented greater opportunities of fraud than any of the other metals used in currency. To debase gold was futile, since the fraud would immediately be revealed by the weight or colour of the metal; and in all important transactions gold appears to have been reckoned by weight in ancient times. Brass and copper, on the other hand, were not of sufficient value intrinsically to be worth tampering with.

Thus the practice of adulterating the silver coins existed from very ancient times. Excluding the

purely fraudulent device of issuing plated or *fourré* coins, such as was common enough under the Republic and early Empire, the first official debasement of the *denarius* occurred under Nero (A. D. 63), when the amount of alloy was about 10 %.

This has sometimes been looked upon as the first step in the downward direction that ultimately brought the imperial coinage to ruin. But since we have already suggested more cogent reasons for the Neronian reform than either lust of gain or dire necessity, the debasement of the *denarius* under Nero may be regarded as an incident in a great financial scheme rather than the initiation of a fraudulent practice on the part of the State.

The subversive element does not arise until the debasement of the silver was carried on irrespective of the relative value of the *aureus*.

Under the Flavians and Antonines the prevailing tendency was to increase the percentage of alloy in the *denarius*, as may be gathered from Hammer's analysis. Thus the amount appears as follows:—Vespasian 15–20 %, Trajan 10–22 %, Ant. Pius 10–30 %, Commodus 30 %, Sept. Severus 25–55 %.¹⁸

Under Septimius Severus the *denarius* is seen almost at its worst. Not only is the average percentage of alloy greater than in the preceding reigns, but the metal of which the coins are composed shows the most extraordinary variation of quality. Some specimens, indeed, are merely of plated copper.

It is obvious, then, that one of two results follows. Since 25 *denarii* could no longer be exchanged for an

¹⁸ J. Hammer, *op. cit.*, p. 98 seq.

aureus, either gold ceased to be a regular and intelligible factor of the monetary system and came to be regarded merely as bullion, or the number of *denarii* tariffed as the equivalent of the *aureus* underwent a change. Further, the debasement of the *denarius* involved a reduction of the brass and copper. Thus the *sestertii* are frequently struck on such small flans that they compare unfavourably with *dupondii* of the first century. The small denominations of bronze gradually disappear and the *dupondius* and *as* seem to have been issued only in small quantities. It may be mentioned in passing, that, owing to the extremely poor quality of the orichalcum of the period, it is often difficult to distinguish between the two denominations commonly described as "second brass". The old rule—which by the way was not always observed—that the radiate head denoted the *dupondius* and the laureate or bare head the *as*, certainly breaks down altogether after the time of Commodus.

§ 15. The "*Antoninianus*".

The most serious effect of the policy of Septimius Severus was that the silver coinage was in imminent danger of losing credit entirely. Hence the motive for the pseudo-reform of Caracalla (A.D. 214), the most striking feature of which was the introduction of a new denomination, generally known as the "*Antoninianus*".

It is convenient for the present to refer to this coin by its popular designation, although the name rests on no better authority than a chance allusion in a letter of Bonosus, which is included in the *Augustan*

History—a late compilation of singularly untrustworthy character.¹⁹ Elsewhere in the same work we find mention of such coins as *aurei Antoniniani*, *argentei Aureliani*, and *aerei Philippei*,²⁰ but they appear to be merely descriptive terms invented at a later date.

Apart from its larger size the new coin was readily distinguished from the ordinary *denarius* on account of its bearing the radiate bust of the emperor instead of the bare or laureate head, which had been the unvarying tradition of the silver coinage.

The first question that arises in connexion with the "Antoninianus" is, what was its current value?

Some writers have maintained that the new coin was a "double denarius".²¹ This theory, however, calls for little comment, since it has been conclusively disproved by Professor Oman in an important article on "The Decline and Fall of the Denarius".²²

The average weight of Caracalla's "Antoninianus" is shown to be 78.3 grs.,²³ and the proportion of pure silver in its composition is about 0.55. The quality

¹⁹ *Scriptores Historiae Augustae*, xxix. 15. On the general question of the numismatic details in the *Scriptores*, see K. Menadier, *Die Münzen und das Münzwesen bei den Scriptores Historiae Augustae*, Berlin Univ. Diss., 1913.

²⁰ *Ibid.*, xxviii. 4 (5).

²¹ Mommsen, *Röm. Münz.*, p. 828, "Binio oder Doppeldenar"; also Gnechi, *Roman Coins*, p. 122: "... the double Denarius or Argenteus Antoninianus, weighing about 5.45 grms. and containing not more than 20 % of silver". The last statement is certainly untrue of Caracalla's "Antoniniani"; cf. Hammer's analysis.

²² *Num. Chron.*, 1916, pp. 37-60. This article contains much valuable information with regard to the "Antoninianus" and the silver coinage generally. I shall not attempt to reproduce what Professor Oman has so ably said, but rather I shall venture to use his article as the basis of the present section.

²³ *Ibid.*, p. 39.

of the metal was therefore practically identical with that of the *denarii* of the period.

Professor Oman estimates the normal, or theoretical, weight of the original "Antoninianus" at 80 grs.; but, although this is approximately correct, it is evident that such a weight would have been unintelligible to the Roman mind. In Caracalla's time the Neronian weight for the *denarius* was still in force. That is to say, the coin weighed, or was supposed to weigh, 3 scripula (= 52.5 grs.). It seems clear, therefore, that the new coin was issued at the weight of $4\frac{1}{2}$ scripula (= 78.75 grs.) or one-and-a-half times the weight of the *denarius*. Thus the "Antoninianus" would be worth 6 *sestertii* or 24 *asses*.

A difficulty arises, however, when we inquire what was the probable relationship of the "Antoninianus" to the *aureus*. Caracalla's *aurei* vary in weight from about 100 to 112 grs. They were, moreover, evidently struck in comparatively small numbers and were little circulated. Professor Oman has suggested that in all probability Caracalla's lighter *aurei* of 100 grs. were intended to exchange for 25 "Antoniniani", which would involve a ratio between gold and base silver of 20 to 1, or, taking the average of pure metal contained in the coins, the ratio of gold to silver would work out at about 12 to 1.

This is clear and in itself perfectly reasonable; but how does the *denarius* fit into the scheme? Reckoning the *denarius* at two-thirds of the "Antoninianus" it follows that the light *aureus*, equivalent to 25 "Antoniniani", would have been worth $37\frac{1}{2}$ *denarii*—a most inconvenient sum. Or again, if the "Antoninianus" was worth 6 *sestertii* it would require 150

sestertii to equal the value of an *aureus* of 100 grs. It is true that from the time of Commodus the weight of the *sestertius* had become somewhat erratic, yet we can scarcely imagine that so radical a change in the relation of the denominations was made.

It is scarcely conceivable that, when Caracalla attempted to reform the currency, he committed so egregious a blunder as to sever the relationship of gold and the baser metals, or that he framed a dual system of base silver on so impractical a basis as that just indicated. Down to the reign of Gallienus it seems practically certain that the *aureus* was tariffed at a definite number of *denarii*. But since the *denarius* had evidently fallen below its theoretical value there seems no reason why in 214 its original relation of $\frac{1}{25}$ of an *aureus* should not have been readjusted.

It has been suggested by Mr. Mattingly—and I venture to think that the suggestion has much to commend it—that Caracalla tariffed his *aureus* at 30 *denarii* or 20 “Antoniniani”. This agrees with the ratio of the “Antoninianus” to the *denarius* at $1\frac{1}{2}$ to 1, and at the same time offers an intelligible basis for the system.

Possibly Caracalla’s experiment proved unpopular; however, the fact remains that no “Antoniniani” appear to have been issued by the short-lived Macrinus, and although, in the early part of his reign, Elagabalus struck both *denarii* and “Antoniniani” he very soon discontinued the issue of the latter.²⁴ The explanation, suggested by Professor Oman, is that the withdrawal of the “Antoninianus” became necessary

²⁴ An “Antoninianus” of Alex. Severus is known; but, needless to say, the coin is excessively rare.

in consequence of Elagabalus having reduced the weight of the *aureus* below Caracalla's minimum of 100 grs. "The moment that *aurei* of 96 or 98 grs. began to appear in numbers, the convenient relation of one to twenty between the silver and the lighter gold ceased to exist."²⁵

It seems pretty certain, however, that when Elagabalus reduced the weight of the *aureus* he also diminished the intrinsic value of the "Antoninianus". Not only are his coins lighter than those struck by Caracalla—that is to say, on the average they fall considerably below the theoretical $4\frac{1}{2}$ scripula—but they are composed of inferior metal. According to Hammer, the "Antoninianus" of Elagabalus contained only 0.428 of pure silver. It may be noted in passing that, as regards quality, the silver coinage of Elagabalus shows the acme of confusion, and the percentage of pure metal in his *denarii* varies from 0.750 to 0.4340.

§ 16. *The Attempted Reform of Alexander Severus.*

The quality of the *denarius*, which was bad enough under Elagabalus, became even worse under Alexander Severus.²⁶ However, about the year A.D. 227 (TR.P.VI) Alexander took steps to reform the silver currency, and his attempt has been memoria-

²⁵ *Op. cit.*, p. 46.

²⁶ A *denarius* of Alex. Severus, which Professor Oman very kindly lent me, after it had been analysed showed the wretchedly small proportion of silver to be 0.334 (the weight of the coin is only 39.8 grs.). Unfortunately the tribunician date is cut off the flan, but since the coin corresponds almost exactly in style, weight, and legend with one in my collection dated TR.P.V, there seems no doubt that the analysed coin belongs to the earlier part of the reign, *i.e.* before the reform.

lized on his coins by such legends as **RESTITVTOR MON(etae)** and **MON·RESTITVTA** (Coh. 516, 180). He undoubtedly effected an improvement not only in the style but also in the composition of the *denarius*. His portrait with slight beard, which appears on the coins struck after A.D. 227, is almost invariably in high relief and compares very favourably with the style of his earlier *denarii*. His finer *denarii* average 49.5 grs., which shows clearly that the 3 scripula standard was aimed at. He did not, however, succeed in raising the percentage of silver in his *denarii* much above 5,²⁷ although many examples seem to be made of very much purer metal, so far as one can judge by their general appearance without having actually tested them.

There seems good reason for supposing that the aim of Alexander's reform was to restore the silver currency to its original status of 25 *denarii* to the *aureus*. Thus having raised the value of the *denarius* somewhat, his next step was to reduce the weight of the *aureus* to about 92 grs. Yet in spite of this alteration he failed to strike the true balance of the metals. The amount of pure silver contained in twenty-five of Alexander's *denarii* is certainly not equivalent to the value of even the reduced *aureus*, reckoning the ratio of gold to silver at 11.5 or 12 to 1, which appears to be a fair estimate for the period. Thus the attempted reform of A.D. 227 was essentially superficial and consequently lacked permanency.

Alexander's successor, Maximinus, issued practically

²⁷ *Denarii* of Alex. Severus analysed by Hammer show 0.5, 0.476, 0.45, 0.406, 0.353, 0.35, 0.337, but he does not give the dates of the coins.

no gold and allowed the *denarius* to fall slightly below the standard fixed in A.D. 227.

In the year A.D. 238 Pupienus and Balbinus revived the "Antoninianus", which they issued in large quantities. In spite of the discredit into which the "Antoninianus" had fallen under Elagabalus, its renaissance appears to have given it a popularity and stability such as it never had before. Although outside evidence is lacking on the point, it is almost certain that this must have been due to some readjustment made in A.D. 238 in the value of the "Antoninianus" relatively to the other factors of the currency. The *denarius*, as a coin, was rapidly becoming extinct, and it is not unreasonable to suppose that it was being crushed out of existence by the "Antoninianus" rated at $\frac{1}{25}$ of an *aureus*. Professor Oman, however, suggests that the revival of the "Antoninianus" was rendered possible by the almost total absence of gold coins during the joint reigns of Pupienus and Balbinus.

In A.D. 242, however, Gordian III did the logical thing and abandoned the issue of the *denarius*; thus the "Antoninianus" became henceforth the *unit* for reckoning silver values. From the reign of Gordian III to that of Gallienus *denarii* and *quinarii* of base silver continued to be issued in infinitesimally small quantities. It is clear, therefore, that they were no longer factors of the regular currency. Probably these smaller coins were in little demand as their relation to the "Antoninianus" of respectively two-thirds and one-third was inconvenient, and the larger coin was found sufficient for all ordinary purposes. We may conjecture, too, that they were rather of the nature of pattern pieces, and that the reason for their

continuance was merely in order to preserve the theoretical structure of the base silver currency.

§ 17. *The "Double Sestertius".*

The reign of Trajanus Decius is marked by the introduction of a new denomination of bronze, which is generally described as a "Double Sestertius", although its actual weight falls considerably below that of two *sestertii*.

The average weight of the *sestertius* under Trajanus Decius is about 310 grs., and an ordinarily fine specimen weighs 333 grs., whereas the weight of a fine example of the "Double Sestertius" is 488 grs., which is approximately one-and-a-half times that of the *sestertius*. It seems, therefore, more in accordance with the weight of the coins to regard the larger bronze coin as equal to a *sestertius* and a half.

Since the coins themselves frequently show signs of having been in circulation they were evidently not issued merely as ornamental or ceremonial pieces. The term Medallion which has sometimes been applied to them is, therefore, inaccurate. Regarding these rather ponderous coins, then, as factors of the regular currency, how are we to account for the introduction of a denomination representing a *sestertius* and a half? A possible explanation is that the traditional relation of four large bronze coins to one silver coin was eminently convenient, but since the "Antoninianus", which was equal to 6 *sestertii*, had become dominant this relation ceased to exist. Thus Decius tried the experiment of issuing bronze coins, worth $1\frac{1}{2}$ *sestertii* apiece, four of which were equal to an "Antoninianus", in order that the old 4 to 1 relationship

should be restored. It is perhaps not altogether without significance that, whereas it had been the invariable custom on the senatorial large brass to portray the emperor either bare-headed or with the laurel wreath, these coins represent Decius wearing the radiate crown, which was the distinctive feature of the "Antoninianus".

The experiment of the so-called "Double Sestertius" appears to have met with small success, and none of these large coins were issued after the reign of Decius.

§ 18. *The End of the Augustan System.*

Never in the whole course of Roman history was the coinage plunged into so wild a state of confusion as during the disastrous reign of Gallienus. Thus the final collapse of the Augustan system was inevitable. The gold was issued regardless of any weight standard. The debased silver "Antoninianus" degenerated into a mere apology of plated copper, in which form it lingered until the first year of Aurelian. The senatorial bronze, which constituted the basis of the Augustan system, after having lost almost every vestige of its former dignity, terminated abruptly, since the introduction of worthless plated coins made the continuance of bronze impossible.

Every disruptive force seemed to have been let loose upon the discredited Roman coinage. Yet the coins of Gallienus abound in surprises. At a time when it might be expected that artistic feeling and refined treatment were almost dead we come across many examples of extreme beauty, worthy of the best period of Roman art. Even amongst the coins of the Gaulish Postumus, whose coinage as a whole is full of

vagaries of all sorts, we find specimens of style and execution that proclaim the work of genuine artists. Few periods can boast of a greater variety of coin-types than when Gallienus misruled the Empire; and, amidst the general heedlessness of the essentials of a satisfactory coinage, considerable attention appears to have been devoted to relatively unimportant matters, such as the devising of new types or the flattering portrayal of the emperor.

§ 19. *The Reform of Aurelian.*

A revolutionary demonstration organized by the moneyers. (A.D. 271) resulting in much bloodshed,²⁸ compelled Aurelian to turn his attention to the lamentable state of the coinage, and to the many abuses that had sprung up in connexion with the mint. No doubt Aurelian designed to carry out a sweeping reformation of the monetary system, but so many other matters, political, military, and economic, pressed for immediate settlement that the indefatigable emperor had to content himself with a somewhat unpretentious scheme, which was of too superficial a character even to restore the discredited Roman coinage to a sound footing.

After the disappearance of the *sestertius* and *dupondius*, the imperial currency was, for all practical purposes, reduced to one denomination, namely the silver-washed copper coins, which were the disreputable remnants of the "Antoninianus".²⁹ In their

²⁸ *Script. Hist. Aug.*, xxvi. 38.

²⁹ Gold coins were issued in small quantities down to the time of Diocletian, but, although they appear to fall into three denominations, their weights are so erratic that they can scarcely be regarded as regular factors of the monetary system.

last phase, under Claudius Gothicus, these coins vary considerably in size and weight and are usually untidy in appearance; their average being 49.9 grs. with a maximum of 70 grs. (25 coins).³⁰ The earliest coins of Aurelian are in general appearance similar to those of his predecessor, and even his portrait is scarcely distinguishable from that of Claudius. The weight of the coins appears, however, to have fallen slightly, as their average works out at 47.55 grs. with a maximum of 58 grs. (9 coins).

After the year 271 a very marked change takes place. The coins are issued at a far more consistent weight and, for the most part, exhibit a very creditable degree of artistic excellence. Aurelian, however, did more than merely effect an improvement in the style and fabric of the coins, since we find unmistakable evidence of his purpose not only to fix, but definitely to state their current values, in the symbol **XXI** or its Greek equivalent **KA** (sometimes **XX** or **K**) which frequently occurs on the larger plated coins and the corresponding symbol **VSV** on the smaller.

Aurelian's system comprised four principal denominations:—

- | | |
|----------------------------------|---|
| (1) Plated copper or mixed metal | $\left\{ \begin{array}{l} (a) \text{ with mark of value } \mathbf{XXI}. \text{ Size } 22\text{--}23 \text{ mm.} \\ (b) \text{ with mark of value } \mathbf{VSV}. \text{ Size } 19\text{--}20 \text{ mm.} \end{array} \right.$ |
| (2) Copper . . . | |
| | $\left\{ \begin{array}{l} (c) \text{ Sestertius (?). Size } 27\text{--}30 \text{ mm.} \\ (d) \text{ As (?). Size } 24 \text{ mm.} \end{array} \right.$ |

In addition to these were issued—but apparently in

³⁰ The unequal composition of the coins of Claudius Gothicus—some being of base silver or billon, while others are practically pure copper—may probably be explained as the result of careless fusion of the metals. Silver, being the heavier of the two metals, would tend to collect at the bottom of the melting pot.

very limited quantities—copper of larger dimensions than (c), probably “Medallions”, and, later on, small plated coins of approximately half the value of (b).

The most important member of the system is the plated coin (a) which resembles the original “Antoninianus”. That is to say, the emperor is always portrayed wearing the radiate crown, and the coin weighs on the average 62·5 grs. with a maximum of 73 grs. (32 coins), which possibly implies a normal standard of 70·15 grs. or $\frac{1}{72}$ of a pound.³¹ Although the general appearance of the coin seems to suggest that it is a survival of the “Antoninianus” it is far more probable that in reality it is a new denomination.

To have attempted to reinstate the discredited “Antoninianus” would have been almost hopeless, since it had lost all pretensions to being even a base silver coin, and its purchasing power must have dwindled to a minimum. It is, moreover, contrary to all the canons of Roman monetary reform to find an attempt made at restoring credit to a declining or decadent coin by suddenly issuing it at a higher weight standard; and, if we except the temporary augmentation in the weight of the *dupondius* that occurred in the middle of the first century, we find that the very opposite procedure is the rule.

These new coins of Aurelian are apparently alluded to by a writer of the Augustan history as “argentei Aureliani”³²—obviously an invented term, which may be placed on a level with “argenteus Antoninianus”; yet, slight as this authority undoubtedly is, there

³¹ The specimens weighed were all in the finest condition; twenty being selected from the Bodleian Collection.

³² *Script. Hist. Aug.*, xxvii. 4 (5).

seems a certain significance in thus applying a distinctive name to Aurelian's coins instead of calling them "Antoniniani", which would have been appropriate if the coins were merely revivals of the older denomination.

The feature of these coins that calls for special consideration is the introduction of the mark of value **XXI**, since it gives the clue for determining the principle on which Aurelian's reform was based, and marks a step in the evolution of the Roman monetary system.

Before venturing on a conclusion as to the probable meaning of the symbol **XXI** it is necessary to refer briefly to some of the theories already advanced by numismatists.

(1) De Salis interprets **XXI** (or **KA**) as indicating that, according to Aurelian's reform, twenty-one of the plated coins were equal to a silver *denarius*, the twenty-fifth of an *aureus*.³³ This theory, however, presents two difficulties. In the first place, since Aurelian issued no silver coins of any sort, it is evident that, if he took the *denarius* as the basis of value, either he must have adopted the standard of one of his predecessors—a manifestly difficult undertaking in view of the enormous fluctuation in the value of the *denarius* during the last fifty years of its existence—or, failing this, he must have assumed a purely hypothetical value for the *denarius*, reckoning it, that is to say, not as an actual coin but as the twenty-fifth part of the current *aureus*. This again would scarcely have been possible, since Aurelian's gold coins show a gradation in weight ranging from 9.1 to 3.5 grms. (= 140.4

³³ *Num. Chron.*, 1867, N.S., vol. vii, p. 325.

to 54.0 grs.).³⁴ The term "denarius" was used for reckoning money down to the time of Diocletian, but the amount represented by the term tended to diminish. Therefore, in 271 it is inconceivable that it could have implied so great a value as twenty-one of the plated coins.

Secondly, it is obvious that twenty-one is a most inconvenient number to reckon; and it is inconceivable that the twenty-first part of the obsolete silver *denarius* should have been adopted as the basis of any scheme for the improvement of the monetary system.

With reference to the numeral **XX** (or **K**) occasionally found in place of **XXI** (or **KA**), De Salis goes on to state that "in the provinces reclaimed from Tetricus, the proportion of the old to the base *denarius* seems to have been, till the middle of the reign of Probus, as one to twenty instead of twenty-one".

This, however, only leads to worse confusion, since it means that the same denomination would stand in an alternative relation of either one-twentieth or one-twenty-first to its unit.

(2) Dattari in his article, "La cifra **XXI** sopra i così detti Antoniniani",³⁵ rightly points out that the formula cannot be regarded as 21 as the **I** is frequently separated from the **XX**, or occasionally omitted entirely. He maintains, further, that the **I** is not strictly a numeral but the traditional symbol of the *as*, such as occurs on the early Republican bronze. Thus **XX·I** signifies 20 *asses*. It is unnecessary here to attempt to reproduce Dattari's arguments in support of this

³⁴ Seeck, *Zeit. für Num.*, xvii, p. 39; and cf. Rohde, *Die Münzen des Kaisers Aurelianus*, etc., p. 288 f.

³⁵ *Riv. it.*, 1905, pp. 443-9.

theory. But while admitting their ingenuity a serious difficulty is presented by the occurrence of **VSV** on coins approximately half the weight of those marked **XX·I**. Thus if **XX·I** stands for 20 *asses* we should naturally expect to find on the smaller coins **X·I** or **VV·I**, whereas it is clear that the two **V**'s are only equal to a semis (**S**) or half that of the other.

(3) It has been suggested that the **XX** indicates that the coin was a piece of 20 *denarii*. This, however, presupposes a decline in the value of the *denarius* far beyond what appears to have actually occurred. It would, in fact, no longer be a coin but a mere standard of reckoning values. It may be pointed out, moreover, that the term *denarius* was in common use at any rate down to the time of Diocletian's *Edictum de pretiis*, when it is clear that it denoted a value considerably greater than $\frac{1}{20}$ of the plated coins marked **XX·I**.

(4) Mr. Hill, who follows Seeck and Missong, suggests that the **XXI** (or **KA**) signifies the equation 2 *denarii* = 1 unit. "The **XX** or **K**", he says, "must signify that the coin is a double *denarius*, and the **I** or **A** that it is the unit of reckoning." ³⁶

One is naturally diffident in advancing a fresh

³⁶ *Handbook of Greek and Roman Coins*, p. 51 (also cf. Seeck, *op. cit.*, p. 118). Mr. Hill is referring primarily to the coins of Diocletian with **XXI**, but his note applies equally to those of Aurelian.

It is a little puzzling to find that **XX·I** also occurs on certain "folles" or reduced "folles", issued under the Tetrarchy about the year 303. Evidently these larger coins were not of the same current value as the small plated coins issued between A.D. 271 and 303, although Dattari has attempted to identify the two groups. We shall, however, deal more fully with the point in the next section.

theory on a subject already overburdened in this respect; but, since none of the foregoing appears to offer a complete explanation of Aurelian's coinage, I feel justified in making a suggestion which may, I trust, prove a step towards a final solution.

Obviously the symbol **XXI** on the larger plated coins cannot be considered apart from the **VSV** occasionally found on the smaller. In these two symbols the **I** and the **S** must stand for *unit* and *semis* respectively; and it appears probable that Seeck and Missong are right in regarding **XX**, not as the numeral 20, but as two **X**'s. Thus the symbols may be translated as 2 **X**'s = 1 (unit) and 2 **V**'s = $\frac{1}{2}$ (semis).

Referring to the monetary conditions of the period we have shown that during the reign of Claudius Gothicus the "Antoninianus" had been running its downward course, and it seems pretty certain that in the first year of Aurelian it came to an end. We may believe, however, that while it lasted, its relation to the *denarius* was theoretically the same as formerly, although the *denarius* as a coin had long ago disappeared from circulation. That is to say, small as the actual value of the "Antoninianus" had become, it was still in theory half as much again as that of the *denarius*.

Aurelian evidently took this theoretical ratio as the basis of his monetary system, and accordingly issued bronze coins containing a small percentage of silver at approximately two-thirds the weight of the debased "Antoninianus".

These smaller coins (*b*), on which Aurelian is invariably portrayed wearing the laurel wreath, and Severina is minus the crescent, weigh on the average

39.5 grs., with a maximum of 46.0 grs. (20 coins). This is, as a matter of fact, somewhat in excess of two-thirds the average weight of the "Antoninianus" and seems to indicate a normal standard of 42.1 grs. or $\frac{1}{120}$ of a pound. However, the discrepancy is considerable, and, in their general appearance, the coins certainly recall the older *denarii*.

The symbol **VSV** found on these coins thus indicates their value as 2 *quinarii* (**VV**) or half (**S**) the larger coin with **XX**. Logically, then, we might regard the larger coin as a "double denarius", yet the occurrence of **I** in the symbol shows clearly that it was not a multiple of some lesser denomination, but was itself the unit of reckoning. How is this to be explained?

I think there is no question that Aurelian's larger coin was never known as a "double denarius", but was simply called by the familiar name of *denarius*. Thus the full interpretation of the two symbols would be as follows:—**XX.I** implies that two debased *denarii* of the standard existing prior to A.D. 271 are equal to one newer *denarius* (or "Aurelianus"—to quote the generally discredited *Scriptores Historiae Augustae*, although the term may have some point after all)—and correspondingly **VSV** implies that two debased *quinarii* are equal to $\frac{1}{2}$ the newer *denarius*.

What Aurelian did, apparently, was to substitute a plated *denarius* for the defunct "Antoninianus"; although the new *denarius* was intrinsically less valuable its weight was almost the same as that of Caracalla's "Antoninianus", and decidedly greater than the very decadent "Antoninianus" of A.D. 270.

The copper group comprises two regular denominations (*c*) and (*d*), sometimes described as medallions;

although more probably they represent an attempt to revive the older *sestertius* and *as*, without SC.

The former range in weight from about 250 to 350 grs. and the latter from 105 to 150 grs.³⁷ The larger coins, *sestertii*, are without exception of considerable rarity, and, although they were struck by Aurelian and by each of his successors down to Numerian, it is evident that their issue cannot have been otherwise than on a very limited scale. Those of smaller size, *asses* (?), are comparatively common with the heads of Aurelian and Severina, but their issue becomes exceedingly scanty after Probus.

The notice of these coins opens up a question that has exercised the minds of numismatists in recent years, as to the value of the mixed-metal coins (*i.e.* coins of plated copper or copper containing a small percentage of silver) relative to the ordinary bronze or copper coins, issued during the latter part of the third century.

The consideration of the question involves a slight anticipation of our subject in one or two points, but its bearing on the coins of Aurelian is so evident that it seems fitting to include it in the present section.

The mixture of a small proportion of silver with the main bulk of copper added slightly to the intrinsic value of the metal, but it seems more than doubtful whether some of the theories based upon this fact can be entertained seriously. For example, Seeck,³⁸ Dattari,³⁹ and others, reckoning the percentage of silver and copper at 0.045 and 0.955 respectively, have

³⁷ Fourteen very fine examples of the latter give an average weight of 122.9 grs.

³⁸ *Zeit. f. Num.*, xviii, p. 118.

³⁹ "La cifra XXI", &c., *Riv. it.*, 1905, p. 446.

attempted to determine the intrinsic value of the mixed-metal coinage in relation to ordinary bronze. Thus, these writers maintain that Diocletian's *folles* was intrinsically of the same value as the Neronian *sestertius*.

Dattari's argument is undoubtedly ingenious and is in itself logical, but it should be pointed out that, so far as analyses of the coins have been made, the only result is to show considerable variation in the amount of silver present. To adjust the intrinsic value of a copper coin by the addition of a small proportion of silver, so that the resultant metal should be two-and-a-half times the value of unalloyed copper, involves a process of such extreme delicacy that it is difficult to believe that either the appliances or requisite skill would have been forthcoming at the close of the third century.

The further difficulty of guaranteeing so enhanced a value in actual currency would have been enormous, especially as the Roman public had had a long and bitter experience of debased, and often fraudulent, money. Moreover, since the percentage of silver tended to vary, the appearance of a coin gave but little indication of its intrinsic value.

Turning to the evidence of the coins themselves we find the ratio between the pure silver and mixed-metal or plated coins definitely shown in the time of Diocletian by the fact that 20 *folles* were equal to a silver *denarius*. That is to say, the value of pure silver relative to the mixed metal was 60 to 1. It is evident, therefore, that the value of the mixed-metal or plated coins was intrinsically very little, if any, greater than that of ordinary bronze.

On the other hand, there seems very little doubt that the silver coating was something more than a merely ornamental device and was intended to give to the coins an increased value in currency. Evidently the actual purchasing power of the plated coinage had become exceedingly small by about the year 271; it is possible, therefore, that in the resuscitation of bronze coins, corresponding with the *sestertius* and *as*, we see an attempt to force up the plated currency to a fictitious value.

This policy was, of course, thoroughly dishonest, and as the ratio between plated and copper coins was entirely artificial, the break-down of the system became inevitable. Hence the gradual disappearance of the *sestertius* and *as* under Aurelian's successors. It, moreover, goes some way towards explaining why Diocletian abandoned the copper or brass currency and issued all his lower denominations in plated copper.

Aurelian's system may be tabulated thus:—

Copper.	Plated Copper.
4 <i>Asses</i> = 1 <i>Sestertius</i> .	
8 „ = 2 <i>Sestertii</i> = 1 <i>Quinarius</i> VSV.	
16 „ = 4 „ = 2 <i>Quinarii</i>	= 1 <i>Denarius</i> XX.I.

Apparently in consequence of the discontinuance of copper *sestertii* and *asses* as regular factors of the currency, there was issued, during the reigns from Probus to Carinus, a plated denomination of about half the value of the **VSV** *quinarius*. On these small coins, which are as a rule of remarkably beautiful workmanship, the emperor's head is always laureated. The weight of finely preserved specimens ranges from 22 to 35 grs., the average being 30.9 grs., thus in all

probability implying a normal standard of 33.6 grs. or $\frac{1}{150}$ of a pound.

In actual practice, however, it would appear that they were only issued in very small quantities, and the **VSV** *quinarii* very soon dropped out of circulation. Probably there was no great demand for these small coins, and the plated **XXI** *denarius*, whose purchasing power cannot have been very great, sufficed for ordinary transactions.

§ 20. *The Reform of Diocletian.*

The reign of Diocletian has been said to mark a new era in the world's history. It was indeed an age of many reforms, and during the joint reign of Diocletian and Maximian as Augusti with Galerius and Constantius as Caesars, no department of State administration, either military, civil, economic, or religious, escaped the most rigorous overhauling.

In no direction was the need of reform greater than in the matter of the currency. For nearly a century the Roman coinage had been steadily going from bad to worse, and during the baleful existence of the "Antoninianus" it reached the lowest depth of degeneracy and as a system lost all coherency. The attempts at revival that occurred during the third century were, as we have seen, merely evanescent. However, Aurelian's unpretentious "reform" had at any rate achieved a result of some importance by the institution of a new plated denomination of definitely fixed value, which had so far proved successful in arresting the tendency to further debasement of the coinage. Aurelian's scheme, however, had proved altogether too inadequate, and so it fell to Diocletian

to grapple seriously with the problem of the currency. This he did with a thoroughness and originality such as had not been seen since the time of Nero, and his reform must be accounted successful in so far as it placed the coinage on an intelligible basis and in a large measure restored the shattered credit of Roman finance. That it was not permanent was due to the unsoundness of the economic principles on which most of Diocletian's schemes were based, and the utter impossibility of arbitrarily enforcing a uniform standard of values throughout the Empire.

Diocletian's reorganization of the Roman coinage was a work that extended more or less throughout the reign in a series of experiments the aim of which was to establish a universal system comprising coins of gold, silver, and plated copper, their relative values being adjusted on a decimal, as opposed to the time-honoured duodecimal basis.

(a) *Gold*. Diocletian's first objective was to restore the *aureus* to its place as an integral factor of the monetary system. When Caracalla (A.D. 214) began to issue gold coins at irregular weights, the relation of the *aureus* to the silver and bronze naturally became confused; added to which the introduction of the base "Antoninianus" proved an entirely subversive element that in the end not only drove the silver coinage out of existence but destroyed all relationship between the different metals of the currency.

The establishment of a gold unit bearing a fixed relation to silver and copper was a matter involved in considerable difficulty.

Seeck⁴⁰ has aptly pointed out that the relative

⁴⁰ Seeck's important article on the coinage of Diocletian (*Zeit.*

values of gold and silver were not universally fixed, and that in provinces where one or other of the precious metals occurred naturally, or owing to the exigencies of local trade, the value of gold relatively to silver varied. Prior to the time of Diocletian no attempt had been made to set up a central standard of values, nor indeed would any such attempt have been practicable.

This no doubt largely explains the changes that occur in the weight of Diocletian's *aurei*.

Seeck⁴¹ has divided Diocletian's gold coins into five classes, which may be summarized as follows :

(1) A.D. 286. Coins issued at irregular weights, frequently falling below 4 grms.

(2) Before A.D. 290. The *aureus* = $\frac{1}{70}$ of a pound (i.e. 4.68 grms. or 72.2 grs. normal). This standard was adopted at Antioch, and coins of this mint not infrequently bear the mark of value O (=70).

(3) *circ.* A.D. 290. The *aureus* = $\frac{1}{60}$ of a pound (i.e. 5.45 grms. or 84.2 grs. normal), with mark of value Z (=60).

(4) A.D. 301. The *aureus* = $\frac{1}{50}$ of a pound (i.e. 6.55 grms. or 101.1 grs. normal), without mark of value.

(5) A.D. 302. The *aureus* = $\frac{1}{50}$ of a pound (i.e. 5.45 grms. or 84.2 grs. normal), with mark of value Z (=60). This standard survived in the East probably till the year A.D. 324, in Italy and Africa till A.D. 312, and in Illyria till A.D. 314.

The alternation between *aurei* of $\frac{1}{60}$ and those of $\frac{1}{50}$

für Num., vol. xvii, pp. 36 ff.) is frequently referred to in the course of this section.

⁴¹ *Op. cit.*, p. 40; cf. also Hill, *Handbook of Greek and Roman Coins*, p. 54.

seems to indicate the empirical character of the system, or more probably an attempt to fix the value of the *aureus* artificially at a standard which did not wholly coincide with the natural rate of exchange.

There seems good reason to believe that at the time of the Edict Diocletian really intended the weight of the *aureus* to be $\frac{1}{50}$ of a pound, since this produces a perfectly symmetrical system on a decimal principle. Thus the pound of gold would be equal to 50 *aurei*, 1,000 *denarii argentei* (*miliarensia*), 50,000 *denarii aerei*, or 100,000 *contenionales*. When, however, it became necessary to reduce the weight of the gold coin to $\frac{1}{60}$ there naturally followed a proportionate increase in the number of all coins relatively to the value of a pound of gold as follows: the pound of gold = 60 *aurei* = 1,200 *denarii argentei* = 60,000 *denarii aerei* = 120,000 *contenionales*.

(b) *Silver*. The restoration of the silver currency, which was obviously necessary in order to bring the *aureus* into definite relation with the lower denominations, was undoubtedly the most important achievement of Diocletian's reform.

Diocletian's silver coinage appears to have undergone a series of changes corresponding with the variation in the weight of the *aureus*. In the earlier years of the reign, at any rate as early as A. D. 290, according to Seeck and Dattari,⁴² the *aureus* was equal to 25 silver *denarii*, i.e. 1,500 silver coins were the equivalent of a pound of gold. The weight of this newly introduced *denarius* was based on the Neronian standard of A. D. 63, namely 52.64 grs. or $\frac{1}{96}$ of a pound. On some

⁴² G. Dattari, "Il sistema monetario della riforma di Diocleziano", *Riv. it.*, 1906, p. 375-96.

specimens there occurs the numeral *XCVI*, thus leaving no doubt as to the intended normal standard. By the monetary reform of A.D. 296 the number of silver *denarii* equivalent to the *aureus* was reduced from 25 to 20; and if, about the year 301, the weight of the *aureus* was raised to $\frac{1}{50}$, it is evident that a corresponding increase must have occurred in the weight of the *denarius*. Thus the *denarius*, or as it may perhaps be designated the *miliarensis*, since it was supposed to represent the value of $\frac{1}{1000}$ of a pound of gold, seems at this period to have been issued at the standard of $\frac{1}{84}$ or 60.14 grs.

Subsequently, when the weight of the *aureus* was reduced from $\frac{1}{50}$ to $\frac{1}{60}$, the *miliarensis* returned to its original standard of $\frac{1}{60}$, still, however, retaining its relation to the *aureus* of 20 to 1; and although this necessarily changed the equivalent of the pound of gold from 1,000 to 1,200 silver coins the latter were apparently still known as *miliarensia*.

(c) *Copper*. Diocletian's copper, or more correctly mixed-metal, coinage (since all the coins contain a small percentage of silver) opens up several questions upon which somewhat divergent views are held by numismatists.

Excluding coins of unusual size, commonly called "medallions",⁴³ the reformed system of the Tetrarchy consisted of three regular denominations, the *follis*, the *denarius aereus* or *communis*, and the *quinarius* or *centenionalis*.⁴⁴ Of these the *follis* was the predomi-

⁴³ The larger bronze coins are probably multiples of the *follis*.

⁴⁴ Objection may be raised to the terms *miliarensis*, *follis*, and *centenionalis*, as applied to the coins of Diocletian, on the ground that any clear authority for their use is lacking. But the common

nant factor. Prior to 296 the plated *denarius* had been struck in enormous quantities and, even if its issue was discontinued, must have formed a substantial part of the currency. The *centenionalis* appears to have been in small demand, and its issue was probably confined to the metropolitan mint. In addition to these regular denominations we find others of an extraneous nature described by Cohen as "entre MB et PB". Unsatisfactory as the term undoubtedly is, it will be necessary to retain it for the present, since we possess no evidence as to the true nomenclature of the coins.

(1) *The Follis*. The largest and by far the most important member of the group is the *follis* (described by Cohen as MB). After the year 296, the *miliarense* or *denarius argenteus*, according to Seeck, was worth 25 *folles*; Lépaulle,⁴⁵ however, puts the number at 20, and Dattari at 16. With regard to its weight, Lépaulle gives 140.3 grs. (= 9.08 grms.) or $\frac{1}{36}$ of a pound, while Dattari estimates its normal weight at 154 grs. (= 9.99 grms.) However, having weighed 60 fine examples of the *follis* issued under the Tetrarchy I find the average weight works out at 162.3 grs., with a maximum of 185 grs. This naturally leads one to infer that the normal weight standard must be decidedly higher than that assigned by either Lépaulle or Dattari.

It appears beyond question that Diocletian's method of reckoning coin-weights was according to fractions of the pound. The numerals O and Z on the gold, and

employment of this terminology seems to justify its adoption in the present section.

⁴⁵ E. Lépaulle, *Rev. Num.*, 1889, pp. 119-25. Cf. also Blanchet, *Les monnaies romaines*, p. 15.

XCVI on the silver, are incontestible evidence of this; and since this method was adopted for the gold and silver it is natural to suppose that it was also employed for the copper. Again, since Diocletian reverted to the Neronian standard for fixing the weight of his silver coin, it seems by no means improbable that the weight of his copper was determined by the same standard. Thus Nero's copper *as*, issued at $\frac{1}{30}$ of a pound (168.4 grs.), supplied an eminently convenient weight, which corresponds so closely with the average weight of Diocletian's *folles* that there seems very little doubt that the latter was normally issued at this standard.

The difficulty of ascertaining the theoretical weight of the *folles* is enormously increased by the fact that towards the end of the Tetrarchy the coin began to dwindle, and since the coins are undated it is not always possible to decide which of them belong to the earlier part of the period.

Assuming then that the normal weight of the *folles* was originally 168.4 grs., it is quite inconceivable that a silver coin of 52.64 or even 60.1 grs. should have been worth as many as 25 *folles*; in spite of the fact that bronze had apparently depreciated in relation to gold and silver since the time of Nero. A revival of the old equation of 16 copper *asses* of $\frac{1}{30}$ to a *denarius* of $\frac{1}{96}$ of a pound would seem perfectly natural had the relative values of the metals remained the same. But in the year 301, when the *miliarense* was issued at $\frac{1}{84}$, it is evident that this proportion was impossible. Further, since Diocletian manifested a partiality for a decimal system we can only conclude that the *miliarense*, or silver *denarius*, was worth 20 *folles*. This relation between the coins continued even when the

miliarense was reduced to $\frac{1}{96}$ of a pound, although, as a natural consequence, we find a tendency to reduce the weight of the *follis*.

(2) The connecting links between Diocletian's system and the coinage that preceded it are the "*denarius communis*" and *quinarius* or "*centenionalis*." From the time of Aurelian's reform (A.D. 271) the chief factor of the currency was, as we have shown, the plated copper coin with **XXI** described as a "new *denarius*". Diocletian and his colleagues continued to issue this coin in large quantities down to about the year 296. No alteration was made in its general appearance, *i.e.* the emperor is invariably portrayed wearing the radiate crown and almost always the cuirass, and the numeral **XX·I** frequently appears on the reverse.

The **XX·I** seems to have been retained simply with a view to preserving the continuity and traditional aspect of the coins.

It seems pretty clear, however, that the coin, either with or without **XXI**, issued under the Tetrarchy, was known as a "*denarius communis*" or simply a *denarius*; and further that it is the coin that is taken as the basis of values in the *Edictum de pretiis*, according to which 50,000 of these *denarii* were rated as the equivalent of a pound of gold.⁴⁶

Under Diocletian, however, a slight reduction appears to have been made in its weight, and Aurelian's standard of $\frac{1}{72}$ of a pound was replaced by the

⁴⁶ According to our modern standard 1 lb. of almost pure gold is worth 42,240 halfpennies. Thus Diocletian's *denarius communis* may be expressed as equal to about $\frac{1}{16}$ of a modern penny, which appears to be about the value of the coin termed a *denarius* in the Edict of prices.

newer standard of $\frac{1}{75}$. Thus the normal weight of the coin would be 67.36 instead of 70.15 grs. The difference is only trifling, and one is bound to admit that it is impossible to state categorically, merely on the evidence deduced from weighing specimens, that such a change actually took place. But since 50 of Diocletian's coins, with **XXI** on the reverse, all in the finest condition,⁴⁷ give an average weight of 61.29 grs., which is slightly lower than the average of Aurelian's coins (*vide supra*), and since the proportion of $\frac{1}{75}$ theoretically fits in with the rest of Diocletian's system far better than $\frac{1}{72}$, we may conclude that this change of weight is, at any rate, highly probable.

During the latter part of Diocletian's reign the **XXI** *denarius* was superseded by a coin of somewhat similar appearance, without mark of value, but of reduced weight.

The authorities on the coinage of Diocletian already cited state that the "*denarius communis*" was worth half a *folles*. Yet despite this consensus of opinion I find it impossible to accept this estimate of the relative values of the two coins.

Whether we estimate the normal standard of the *denarius* at $\frac{1}{72}$ of a pound, as Lépaulle and others, or at $\frac{1}{75}$, as seems to me the more probable, in either case it falls considerably below half the weight of the *folles*. The equation of 1 *folles* = 2 *denarii* involves putting the normal weight of the *folles* at $\frac{1}{36}$ of a pound or 140.3 grs. (Lépaulle's estimate), which is evidently far too low. If, however, the *folles* was issued normally at $\frac{1}{30}$ (= 168.4 grs., *vide supra*) and the *denarius* at $\frac{1}{75}$

⁴⁷ These specimens were selected mainly from the Bodleian Collection.

(67·36 grs.) we have an exact ratio between the coins of $2\frac{1}{2}$ to 1.

In corroboration of this conclusion we have evidence, outside that of the coins themselves, to show that in the year 301 a pound of gold was worth 50,000 *denarii*; and as we have already shown that the *aureus* was worth 20 *miliarensia* and the *miliarense* was worth 20 *folles*, it follows that the pound of gold = 50 *aurei* = 1,000 *miliarensia* = 20,000 *folles* = 50,000 *denarii*. That is to say, the *follis* was worth $2\frac{1}{2}$ *denarii*. This, at any rate, appears to have been the relation between the coins at the time the new currency was inaugurated. Within a few years, however, the weight of the *follis* became considerably diminished, consequently its relation to the *denarius* changed.

Some light is thrown upon the question of the current value of the *denarius* at the beginning of the fourth century by Diocletian's famous *Edictum de pretiis*⁴⁸ referred to above. This monumental example of economic fallacy, which attempts to fix a maximum scale of tariffs from the price of an onion to the fee of a barrister, naturally contains a good deal that is of small importance to us and must have been merely tiresome to the people of Diocletian's day. Here and there, however, we find items which give some clue to the purchasing power of money at the period. For example, the wages of an agricultural labourer are fixed at a maximum of 25 *denarii* per diem, the price of beef at 8 *denarii* a pound and pork at 12. It is evident, therefore, that although the coin termed in the "Edict" a *denarius* was of low value,

⁴⁸ *Edictum Diocletiani* (Mommson, ed. by H. Blümner, 1893).

it could not have been worth less than $\frac{1}{25}$ of an Augustan *denarius*.

(3) The smallest denomination in the monetary system of Diocletian is the *centenionalis* or bronze *quinarius* (PBQ) on which the emperor's head is always laureate. Its normal weight is exactly half that of the *denarius aereus*, i.e. 33.68 grs. of $\frac{1}{150}$ of a pound. Thus it formed a continuation of the small plated coin current during the period from Probus to Numerian. The name "centenionalis" appears to be derived from the fact that it represented the 100th part of a *miliareuse*, or *denarius argenteus*, or the 100,000th of a pound of gold. Judging from the comparative rarity of these little coins at the present time, it may be conjectured that their issue was far more limited than that of the higher denominations.

(4) The coins of intermediate size between the *follis* and *denarius communis*, mostly described by Cohen as "entre MB et PB", must be considered as transitional issues rather than new factors of the monetary system instituted under the Tetrarchy.

There is no question that Diocletian aimed at arbitrarily establishing a universal monetary standard; but although the two main factors of his system, namely the *follis* and *denarius*, were current throughout every province of the Empire, it by no means follows that the exchange value of the coins was uniform. Further, the appearance of coins of intermediate sizes affords unmistakable evidence that the prescribed coinage was either inadequate or unsuitable for local requirements. Hence it is not altogether surprising to find that, in order to bring the coinage more into harmony with traditional money values or local usages,

certain alterations were made in Diocletian's symmetrical and highly artificial system, which inevitably reduced it to a state of confusion.

These developments were not confined to the East, but appear to have occurred in varying degrees throughout the greater part of the Empire.

The coins that result from these local efforts at reform are of a transitional character and naturally exhibit considerable variation in the matter of weight. However, despite the appearance of confusion presented by the coinage of this period in general, it is possible to discern two fairly defined elements: (1) a new denomination was instituted in the last year, or perhaps two years, of the Tetrarchy, and this continues down to about the year 314; (2) the *follis* passes rapidly through various stages of reduction until it finally merges into the smaller coin.

(1) The new denomination resembles the *follis* in type and style. That is to say, the Emperor's bust is laureate, and on the reverse the types most commonly met with are **GENIO POPVLI ROMANI** or other types characteristic of the *follis*. The coins weigh on the average 98.0 grs., which probably indicates a normal standard of 101.04 grs., or $\frac{1}{50}$ of a pound. This distinctive weight, and the fact that they were first issued while the *follis* retained its original standard, or at any rate was only beginning to show signs of diminution, is practically conclusive evidence that these coins form a denomination apart from the ordinary *follis*.

A somewhat limited number was issued by Diocletian and Maximian shortly before their abdication, and by Galerius as Caesar, but they become far more numerous

after Galerius assumes the title of Augustus and under Maximinus. By the year 311 they appear to have either ousted or absorbed the *follis* and consequently became the largest bronze coins in regular circulation.

The following may be taken as representative examples of this denomination :

Class 1 (under the Tetrarchy).

Obv.—IMP C VAL MAXIMIANVS P F AVG. Laur. bust of Maximian r.

Rev.—GENIO POP ROM. Genius. PTR, PLC, PLN. (Weights, 93, 94, 95, 96, 99, 103, 106 grs.)

Class 2 (after 305).

Obv.—IMP. C. GAL VAL MAXIMIANVS P F AVG. Laur. head of Galerius r.

Rev.—GENIO IMPERATORIS. Genius. ALE, &c. (Weights, 90, 93, 95, 99, 100 grs.)

Diocletian with *Rev.* QVIES AVGG. (92, 94 grs.)

Divo Constantio with *Rev.* MEM. DIVI. CONSTANTII. (Weights, 88, 93 (3), 98, 99, 100, 105, 107, 113 grs.)

It is not altogether easy to determine the relation of coins of this weight to the other current denominations. They cannot very well be "half-folles" as their weight is considerably more than half that of the *follis*. Moreover a half-follis would involve the rather awkward proportion to the *denarius communis* of $1\frac{1}{4}$. It will be seen, however, that their weight is exactly one-and-a-half times that of the *denarius* or three times that of a *centenionalis*, and presumably on the strength of this some writers have described this denomination as a "teruncius".

It must be admitted that the term has little to commend it, and since the *centenionalis*, or *quinarius*,

never obtained more than a very limited circulation it is improbable that it was taken as the unit of reckoning when the new denomination was devised.

In spite of its deficiency in the matter of weight, it seems more reasonable to suppose that in currency this new denomination was worth 2 *denarii communes* and that the *follis* gradually dropped to the same value. Moreover, the fact that the numeral K almost invariably occurs in the field on later examples, particularly those of Alexandrian mintage, seems to point to this conclusion.

(4) *The Decline of the Follis.* We have already anticipated the stages by which the weight of the *follis* dwindled from $\frac{1}{30}$ to $\frac{1}{50}$ of a pound. Since, however, it is in this connexion that some light is thrown on the meaning of the symbol XX.I found on later examples of the *follis*, it seems worth while to consider the question in detail. According to the theory advanced by Dattari⁴⁹ the Alexandrian *follis* with XX.I was equivalent to the plated *denarius*, not only in currency but intrinsically. He bases his argument on the hypothesis that the amount of pure silver in the plated *denarius* was 0.055, whereas the *follis* contained only 0.045. Even allowing that these percentages represent the average found in the coins it is impossible to overlook the utter impracticability of attempting to regulate the value of copper coins by embellishing their surface with a thin coating of silver.⁵⁰ It is, moreover, highly improbable that coins of such different appearance and size should have been regarded as of equal value.⁵¹

⁴⁹ *Riv. it.*, 1905, pp. 443-9.

⁵⁰ Cf. § 19.

⁵¹ It may be mentioned that *folles* with XX.I are not confined

A far more probable explanation of the symbol **XX·I** on the *folles* seems to be that the copper *denarii* of the Tetrarchy had become extinct, and just as Aurelian had taken the theoretical standard of the debased *denarius*, two of which were equal to the newer *denarius*, so there was no reason why the same symbol should not have been employed at a later date to indicate that a coin was the equivalent of two of Diocletian's *denarii communes*.

If, as I believe, the symbol **XX·I** does not occur on the *folles* until almost the end of the Tetrarchy, just before the coin began to show signs of losing weight, it seems probable that in certain provinces it was already beginning to pass at the rate of two instead of two-and-a-half *denarii*. Hence the employment of the symbol.

The following examples of the Alexandrian mint may serve to illustrate the decline of the *folles*:

- (a) A.D. 304 or 305. *Follis* of usual size, but showing signs of slightly reduced weight.
Maximian. Rev.—GENIO. POPVLI. ROMANI;
 164 grs., diam. 1·10 in.
Galerius Caesar (similar); 150 grs., diam. 1·10 in.
- (b) 305. Reduced size and weight.
Galerius Caesar (similar); 125 grs., diam. 0·95 in.
- (c) After 305.
Galerius Augustus. Rev.—VIRTVS. EXERCITVS;
 130 grs., diam. 0·90 in.
Diocletian (after abdication). *Rev.—PROVIDENTIA. DEORVM.*; 114 grs., 115 grs., diam. 0·90 in.

Subsequently the *folles* was reduced to about 100 grs., at which stage it became amalgamated with the

to the mint of Alexandria, but were issued elsewhere—at Siscia, for example.

denomination characterized by the numeral **K**, described above.

Although the *follis* underwent a similar process of diminution in every province of the Empire, the rate at which it was reduced does not appear to have been uniform. At Antioch, for example, its decline seems to have been less rapid than at Alexandria. Thus we find the **PROVIDENTIA DEORVM QVIES AVGG** type (after 305) occurring simultaneously on coins of two sizes, *i.e.* the ordinary *follis* of $\frac{1}{30}$ and the newer denomination of $\frac{1}{50}$. Again, at the western mints, such as Trèves and Lyons, the original standard of the *follis* seems to have been retained some time after it had been reduced at Alexandria.

The foregoing considerations, however, throw practically no light on the following bronze coin of Maximianus:—

Obv.—**IMP C MAXIMIANVS P F AVG.** Radiate and draped bust r.

Rev.—**CONCORDIA AVGG.** Diocletian and Maximian seated l. on curule chairs. In ex., **S. C.** [Coh. 46.]

The only specimen of this extremely rare coin that I have had an opportunity of examining is in the Bodleian Collection. The coin is in good condition and weighs 120 grs. Cohen classes it as MB and not as “entre MB et PB”, although it is decidedly smaller and lighter than the ordinary *follis*. Indeed, the portrayal of the emperor wearing the radiate crown instead of the wreath, the unusual occurrence of **S. C.**, and its general unlikeness to the *follis*, indicate plainly that it does not belong to this denomination. Nor, on the other hand, can it be classed among the coins of intermediate size already described.

From a single specimen it is of course impossible to conjecture its normal weight or its probable relation to other coins of the period. No coins of corresponding style appear to have been issued by Diocletian or by either of the two Caesars, Galerius and Constantius. So that this type of Maximian stands alone.

The only explanation I can offer for the occurrence of this remarkable coin is that, while Maximian was in command of the government at Rome, it is possible that he made an abortive attempt to revive the old Senatorial bronze coinage on his own initiative. But whether he was actually trying to reintroduce the old *dupondius* or whether he contemplated the issue of a new series of bronze denominations must be left an open question.

APPENDIX I.

TABLE I.

DENOMINATIONS CURRENT UNDER DIFFERENT EMPERORS B.C. 15-A.D. 258.

	Aureus.	Quinarius A.	Denarius.	Quinarius R.	Sestertius.	Dupondius.	As (copper)	As (orich.)	Semis (copper.)	Semis (orich.)	Quadrans (copper.)	Quadrans (orich.)	Antoninianus.
Augustus . . .	+	+	+	+	+	+	+	-	-	+	+	-	-
Tiberius . . .	+	+	+	+	+	+	+	-	-	+	-	-	-
Caligula . . .	}	+	+	+	+	+	+	-	-	-	+	-	-
Claudius . . .													
Nero	+	+	+	+	+	+	+	+	+	+	+	+	-
Galba	+	+	+	+	+	+	+	-	-	-	-	-	-
Otho	+	-	+	-	-	-	-	-	-	-	-	-	-
Vitellius . . .	+	..	+	..	+	+	+	-	-	-	-	-	-
Vespasian . . .	+	+	+	+	+	+	+	+	+	-
Titus	+	+	+	+	+	+	+	-
Domitian . . .	+	+	+	+	+	+	+	-	-	-	-	+	-
Trajan	+	+	+	+	+	+	+	-	-	+	+	-	-
Hadrian	+	+	+	+	+	+	+	+	-	+	-
Ant. Pius and M. Aurelius . }	+	+	+	+	+	+	+	-	-	+	-	-	-
Commodus . . .	+	+	+	+	+	+	+	..	-	-	-	-	-
Sept. Severus .	+	..	+	..	+	+	+	-	-	-	-	-	-
Caracalla . . .	+	..	+	..	+	+	+	-	-	-	-	-	+
Alex. Severus Maximinus . }	+	..	+	..	+	+	-	-	-	-	-	-	-
Pupienus . . . }	+	..	+	..	+	+	-	-	-	-	-	-	+
Balbinus . . . }													
Gordian III. . .	+	..	+	+	+	+	-	-	-	-	-	-	+
Philip I- Gallienus . }	+	..	+	+	+	+	-	-	-	-	-	-	+
Decius	+	+	+	..	-	..	+	+

The above table includes only such denominations as obtained ordinary currency, thus omitting multiples

of the *aureus*, *denarius*, *sestertius*, or *as*, popularly described as "medallions".

TABLE II.

THE DECLINE OF THE SESTERTIUS.

	Average weight of Sestertius.	Composition of Orichalcum.			
		Copper.	Zinc.	Tin.	Lead.
Claudius. . .	438.5	{ 77.44 72.2	21.5 27.7	— —	— —
Nero	419.5	81.07	17.81	1.05	—
Vespasian and Titus . . }	406.0	81.80	16.3	—	1.1
Trajan . . .	403.0	{ 78.55 88.58	16.4 7.56	3.01 1.8	— 2.28
Hadrian . . .	419.4	{ 91.24 85.67	7.14 10.83	— 1.14	— 1.73
Ant. Pius . .	422.0	87.86	8.14	3.88	—
M. Aurelius. .	409.0	85.63	6.07	4.62	2.0
Commodus . .	401.25	85.6	5.77	4.02	4.17
Sept. Severus .	378.5				
Caracalla. . .	394.0	86.98	5.0	4.27	3.23
Alex. Severus .	316.5	{ 75.0 71.56	5.63 8.79	6.82 6.45	12.0 13.09
Gordian III. .	325.5	{ 78.0 77.1	8.33 1.36	8.73 7.54	4.74 12.7
Trajan Decius .	310.0				
Gallienus . .	about 250.0				

The average weights given in the above table, as a result of having weighed several hundred *sestertii*, are not, however, much guide as to difference existing between the maximum and minimum weights of coins issued in any particular reign. From the time of Septimius Severus the margin of difference tends to widen, and under Gallienus well-preserved specimens range from about 190 to 320 grs.

The elaborate analysis of the metals composing Roman coins drawn up by J. Hammer (*Zeit. für Num.*, 1908, xxvi, pp. 1-141), an extract from which is given above, shows that the quality of orichalcum varies considerably at different periods, and even in the same reign coins not infrequently exhibit a curious inequality of composition.

It will be noticed that there is a more or less constant tendency to reduce the percentage of zinc, the metal which was essential in the production of orichalcum; whereas lead, the cheaper and far less satisfactory alloy, is used more freely. The metal was thereby reduced both in value and durability, and, as a matter of fact, during the third century it reverts to practically the yellow bronze of Republican times.

After the time of Commodus the Roman *flatores* seem to have paid little heed to the composition of the metal used for the bronze coinage. Old and worn coins, withdrawn from circulation, would have been thrown into the melting pot, to which were added variable quantities of copper, tin, zinc, or lead (as the case might be), without regard to particular proportions so long as the compound presented the desired appearance.

TABLE III.

Proportion of Silver in the Denarius (abridged from J. Hammer's analysis).

Augustus	from 0.991 to 0.9278
Nero	0.943 „ 0.910
Vespasian	0.886 „ 0.800
Trajan	0.928 „ 0.7854
Ant. Pius	0.9328 „ 0.7015
Commodus	0.720 „ 0.671
Sept. Severus . .	0.755 „ 0.431
Caracalla	0.540 „
Alex. Severus . .	0.500 „ 0.334
Gordian III . . .	0.589 „ 0.361

Proportion of Silver in the "Antoninianus".

Caracalla . .	from 0·623 to 0·520
Elagabalus . .	„ 0·428
Philip I. . .	„ 0·500 „ 0·320
Decius . . .	„ 0·750 „ 0·3964
Gallienus . .	„ 0·720 „ 0·346

The bronze coins coated with silver issued between A.D. 256 and the time of Diocletian show 0·85 to 0·96 of copper and 0·15 to 0·04 of silver; small quantities of lead and tin also occur in their composition.

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