# COMMENTS ON PAMELA NIGHTINGALE, 'ENGLISH MEDIEVAL WEIGHT-STANDARDS REVISITED'

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Dr Pamela Nightingale is a distinguished economic historian well known for her publications on medieval monetary history.[1] Her article in this volume is a response to one published in *BNJ* 2006 in which reasons were set out for rejecting troy as a weight system used in England in connection with the Edwardian and prior coinages. In addition a new interpretation was proposed for Domesday payments *de xx in ora*.[2] Dr Nightingale has now restated her previous opinions on these subjects. The meaning of Domesday terminology is a continuing source of scholarly debate and it is better to leave others to judge the merits of our respective propositions. On the other hand, in seeking to reinstate the use of troy weight from the reign of Henry II she misinterprets the numismatic content of some of her sources to an extent that warrants an immediate reply. I am grateful to the editors of *BNJ* for exceptionally agreeing to publish this short critique in the same volume.

As will have been apparent, Dr Nightingale also takes issue with me on this critique, which was prepared in response to drafts of her article and led to further development of her arguments. There has not been time to extend these comments to correspond, given the proximity of the editors' deadline.

## Henry II

Dr Nightingale has written persuasively on the significance of radical changes made by Henry II in 1158 to moneyers and minting policy, seeing them as part of an overall plan to extend royal authority over the mints.[3] Using a similar approach in her latest article, she argues that since the troy mark was used as the bullion weight in the Angevin territories by 1147 an Angevin ruler bent on harmonising his minting policy had every incentive to introduce it as the bullion weight in England, so that a pound of twelve Paris or Troyes ounces weighing 252 pence of sterling fineness could have been exchanged by the mint for 240 pence, leaving 12 pence to be divided equally between minting costs and the king's seignorage.[4] As an historian she is fully justified in considering whether and if so how Henry II or, for that matter, William I or Cnut might have wished to alter the weight systems they encountered on arrival in England so as to conform with practice in their homelands. However, establishing whether changes were actually made must depend on a valid assessment of the coins themselves and such documentary evidence relating to them as is available.

Although not necessarily relevant to the purchase of bullion, the contemporary and authoritative *Dialogue of the Exchequer* explains how a sheriff's render to the king (Henry II) was weighed and assayed.[5] As was demonstrated in the 2006 paper, it clearly describes a process where the weight used was the standard of the minted coinage, which was certainly lighter than troy.[6]

*Acknowledgments:* I am grateful to Martin Allen for encouraging me to write this critique and providing several references and sources, and also to Christopher Challis for helpful clarification of a point of difficulty in an article of his that is discussed here. I have also enjoyed an extensive correspondence with Pamela Nightingale which has helped us to clarify some of our points of difference. However, I take full responsibility for my opinions expressed herein.

[1] See especially Nightingale 1982 and 1985. Dr Nightingale's papers on weight standards and other subjects have been republished in *Trade, Money and Power in Medieval England*, Variorum Collected Series, 894 (Aldershot, 2007).

[2] Lyon 2006.

[3] Nightingale 1982, 48–50.

[4] Nightingale 2008, 183 and 191.

[5] Johnson 1983, 8–10.

[6] Lyon 2006, 229.

**Edward I–II**

By the Edwardian period the evidence that troy weight was not being used in the London mint for the purchase of bullion is quite specific. Francesco Balducci Pegolotti, an Italian banker who travelled widely in the first half of the fourteenth century, was a director of his firm's London office from 1317 to 1321. During his long career he recorded in considerable detail relationships between weights in use for gold, silver and different classes of merchandise in cities across Europe and the Mediterranean.[7] He says that in London silver plate, coin and bullion was bought and sold by the mark of the Tower of London, which was aligned with the mark of Cologne, and that no-one, neither citizen nor foreigner, could hold an exchange except the master of the mint.[8] The restriction on exchange is confirmed by a surviving mint document on the recoinage of 1279–80, 'The Form of the New Money'.[9] Pegolotti also mentions a mark 5⅓ sterlings heavier than the Tower mark, which was used by London goldsmiths when silver objects were bought and sold in trade with the public,[10] though if it had been an English troy mark the difference ought to have been twice as large.

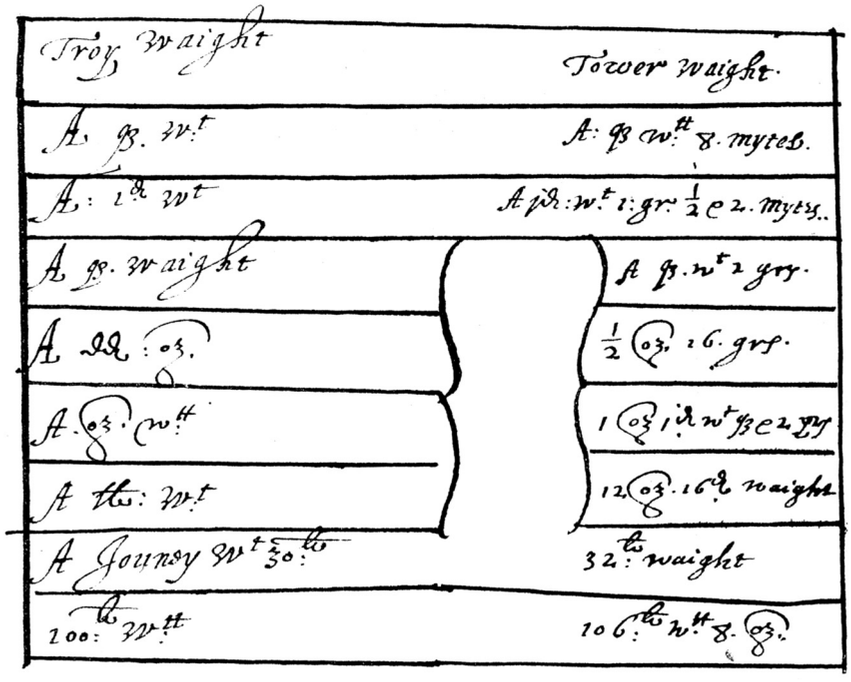
**Bury St Edmunds**

Dr Nightingale argues that the Tower pound was created after 1158 as a result of the deduction of twelve pennyweights from every (French) troy pound of bullion brought to the exchanges.[11] She accepts that bullion was bought by Tower weight after 1279 but considers that this represented a change of policy and that troy weight continued to be used in measuring the fineness of silver and the amount of alloy to be added in the minting process.[12] In support of her case, she cites the verbal instruction given to the abbot of Bury St Edmunds when he was supplied with new dies in the first Edwardian recoinage. The Harleian manuscript which records the circumstances is basically a Latin document, evidently from Bury, which incorporates, apparently verbatim, two separate passages in Norman French.[13] The first records a judgment by the king's council that the abbot of Bury should be provided with dies and informed by word of mouth of the minting standard. It is followed in Latin by a statement that Gregory de Rokesley (who was a warden of the London mint) was ordered by the council to do this. The second passage is what de Rokesley said to the abbot. Finally there is some explanatory detail in Latin that is presumably not a direct quotation.

In the record of his verbal instruction, de Rokesley describes the pound of money. This must be the Tower pound, because he says it has to weigh (or, rather, be minted into) 243 pence by tale, with a tolerance of no more than a penny either way. A departure of 1½ gr. from the correct weight of an individual penny is allowed, but for no more than six heavy and six (exceptionally seven) light pence in a pound. The final (Latin) passage states that an ounce weighs twenty pence and a penny weighs 24 gr., with heavy and light pennies of 25½ and 22½ gr. respectively.[14] If, as may be thought more than probable, this defines the upper and lower limits for the weight of the minted penny, the grains must be lighter than troy because the standard, when expressed in troy weight, was 22½ gr.

[7] Evans 1936.
[8] Evans 1936, 255.
[9] Johnson 1956, 57–8.
[10] Evans 1936, 255.
[11] Nightingale 2008, 183.
[12] Nightingale 2008, 189.
[13] Johnson 1956, 86–7.
[14] *La livere de la moneye contene xii unces. En la livere deit estre de fin argent xi unces, ii esterlings, et j ferling, et lautre alay. E la livere deit peser monee xx.s. et iij.d. Issint ke nule livere ne seit outre xx.s. iiij.d., ne meins ke xx.s. ij.d. par cunte. E deit la moneye estre talie ken la livere ne deivent estre ke vj. forz et vj. febles, de un grein e demid le fort, et de un grein e demi le feble, al dreit dener. Et cil avient ke set seyent febles utre le grein et demi en la livere trove par le assaiur; ja pur ceo ne lesse kil ses ne delivere, si plus ni seient. E tele est la moneye le rey. // Uncia ponderat xx.d. Denarius ponderat xxiiij. grana. Denarius fortis ponderat xxv. grana et dimidium granum. Denarius debilis ponderat xxij. grana et dimidium granum. . .. . . Item nota quod xi uncie, ij.d., q[a]. debent esse de ita puro argento sicut est illud de quo fiunt folia argentea. Et dicitur uulgariter tale argentum, argentum de Gutheron's Lane.* (Johnson 1956, 87.) The pound was to contain as much as 11 oz. 2¼ dwt of silver of the fineness of the silver leaf of Gutter Lane, the home of the London goldbeaters, because that leaf was itself slightly less than 12 oz. fine; the addition of 17¾ dwt of alloy would then result in the metal having the standard coinage fineness of 11 oz. 1½ dwt (Challis 1988, 82).

Nevertheless Dr Nightingale argues that the grains are troy and relate to the standard of fineness of the coins,[15] though it is not clear how that could be the case. She points out that the royal proclamation of 1526 which abolished Tower weight says that the troy pound exceeded the Tower pound by three-quarters of a (troy) ounce,[16] from which she concludes that the Tower pound must have contained either 5,400 troy grains – as, of course, we think of it today – or their equivalent in wheat grains. However, a manuscript in the library of the Society of Antiquaries (an early seventeenth-century compilation of documents relating to mint affairs) includes a table expressing units of troy weight in terms of specific units of Tower weight.[17] The table (Fig. 1) shows that the latter was based on grains, pennyweights,




| **Troy Waight** | **Tower Waight** | ***Meaning*** |
|---|---|---|
| A qr. w:$^{t}$ [¼ dwt] | A: qr w:$^{tt}$ 8 mytes | *¼ dwt 8/20 gr.* |
| A: 1$^{d}$ w$^{t}$ | A: 1$^{d}$:w.$^{t}$ 1:gr:½ & 2 mytes | *1 dwt 12/20 gr.* |
| A qr. waight [1¼ dwt?] | A: qr.w$^{t}$ 2 grs | *1¼ dwt 2 gr.* |
| A half: oz | ½ oz 16. grs | *½ oz 16 gr.* |
| A.oz. w:$^{tt}$ | 1 oz 1.$^{d}$ w$^{t}$ qr & 2gr | *1 oz 1¼ dwt 2 gr.* |
| A lb: w:$^{t}$ | 12 oz 16.$^{d}$ waight | *12 oz 16 dwt* |
| A Journey w$^{t}$ 30:$^{lb}$ | 32:$^{lb}$ waight | *32 lb* |
| 100:$^{lb}$ w:$^{tt}$ | 106:$^{lb}$ w.$^{tt}$ 8.oz | *106 lb 8 oz* |

Fig. 1. Cottonian manuscript comparison of Troy and Tower weight (Society of Antiquaries MS 116, fo.162), with the present writer's transcription and interpretation.

[15] Nightingale 2008, 187.

[16] For the full wording of the proclamation, dated 5 November 1526, see Hughes and Larkin 1964, I, 160–1.

[17] SAL/MS/116, item 11, fols 159–215, fo.162, noted by Ruding 1840, I, 7 whose transcription contains errors. According to the Society of Antiquaries' catalogue this manuscript, containing original documents and copies of documents from the fourteenth to the sixteenth centuries, was compiled mainly in the time of James I. It includes 35 items, a number of which, including item 11, bear Sir Robert Cotton's signature on the contents page. (I am grateful to the Society of Antiquaries and to Dr Elina Screen for help with this reference.) Also relevant is a mint document on gold coinage *c*.1350 or later (Johnson 1956, 83–5) which states that there are 24 carats in a pound of pure gold, each carat weighing as much as half an ounce of silver (*dimidia uncia argenti*) and containing four gold-grains (*iiij$^{or}$ granis auri*). Johnson continues: 'and every gold-grain contains sixty light grains, whereof 24 gr. make a pennyweight'. However, the Latin says *unde quodlibet granum auri continent lx grana argenti subtilia; unde xxiiij$^{or}$ grana faciunt sterlingum in pondere.* Thus it does not refer to light grains as such, but silver grains that are described as *subtilia*, underlining the obvious point that they are smaller (or lighter) than the *grana auri* and 24 of them make the [standard] weight of a sterling.

ounces and pounds, all lighter by one-sixteenth than their troy counterparts, and unless it is a seventeenth-century concoction it demonstrates that the Tower pound actually contained 5,760 grains, as the mint documents imply, with 20 mites to a grain and 24 grains to a Tower pennyweight.

Although Tower and troy each had its own characteristic grain, the traditional approach in English historical metrology following the abolition of Tower weight in the sixteenth century has been to express previous Tower measurements in troy grains,[18] much as troy weights are nowadays frequently converted to metric grams, and failure to appreciate this fact is reflected in Dr Nightingale's misinterpretation of references to grains in the Bury and other mint documents.

The Tower pennyweight is called a sterling by Pegolotti and is frequently referred to by that name in Edwardian mint documents. However, as Dr Nightingale points out, the sterling is consistently defined in treatises on weights and measures from Henry III to Henry VII as comprising 32 grains of wheat from the middle of the ear. Whether this was originally equivalent to the Tower pennyweight of 24 Tower (i.e. 22½ troy) grains or represented a pennyweight of 24 troy grains, and whether its equivalence could have changed over time as the use of troy weight became more general, are important questions that cannot be explored here.

## The fineness and alloying of silver

For the supposed involvement of troy in assaying bullion, Dr Nightingale relies on an important article by Dr Christopher Challis which has as its focus 'the calculation of fineness in the English medieval mint and the elucidation of the documents which relate to it'.[19] One of those documents, *A Treatise on the New Money* which dates from 1286–7,[20] describes the fineness in two ways: as the silver content of a pound of standard money in shillings, pence, fractions of pence and silver grains,[21] or the number of pennyweights and grains of silver in a half-ounce of ten pennyweights.[22] Since a pennyweight contained 24 grains and a half-ounce amounted to 240, it was convenient to make an assay of half an ounce so that the loss of a grain in the fire was equivalent to the loss of a penny in a pound of 240 pence or pennyweights.[23]

Throughout his article, in which he clarifies previously obscure descriptions of the purchase of bullion according to its fineness, Dr Challis refers to pounds, ounces and grains as troy. However, fineness is a relative measure and is the same whether the scale by which it is measured is troy or Tower given that both pounds were divided into the same number of units, so Dr Challis's illuminating ready-reckoner tables are valid for either system.[24] It is unfortunate that the English translation of the Treatise in the *De Moneta* refers to the half-ounce of the assay as containing ten pennyweights, each of twenty-four grains, when the original Latin describes it as the weight of ten sterlings of that number of grains,[25] and Pegolotti's international comparisons leave no doubt that the sterling was a unit of Tower weight, not troy.[26]

Just as fineness is a relative measure, so too is the number of pennyweights of alloy to be added to a given weight of pure or nearly pure silver to create a pound weight of coinage metal. Such a specification in the mint documents is valid regardless of whether the pounds and pennyweights are troy or Tower.

[18] Simpson and Connor 2004, 328–9.
[19] Challis 1988, 84.
[20] Johnson 1956, 65–81; but see Mayhew 1992, 123 for the date of this version of the Treatise.
[21] Johnson 1956, 73.
[22] Johnson 1956, 67 and 73.
[23] Johnson 1956, 67.
[24] In a recent conversation Dr Challis explained to the present writer that it had been no part of his purpose to argue the case for troy weight when discussing fineness.
[25] *Modernis ergo temporibus fieri consueuit assaium de pondere x sterlingorum, scilicet ex dimidia uncia . . .. . . Sicut ergo uiginti quatuor grana faciunt unum sterlingum, sic xxiiij*$^{or}$ *dimidie uncie efficiunt unam libram.* (Johnson 1956, 67).
[26] For example, the Bruges gold mark weighed 8 ounces 8 sterlings of the weight of the Tower of London and was the same as the Paris mark (Evans 1936, 245). The latter is well known to have weighed marginally less than eight English troy ounces.

## Accounting for bullion

In the same article, Dr Challis discusses the way in which William of Gloucester, goldsmith to Henry III and warden of the London and Canterbury Exchanges, accounted for a weight of 23,907 pounds of bullion received at the London mint in 1261. The king's seignorage at the rate of 6 dwt was 597 pounds weight. Coins at that time were sheared at 242 to the Tower pound, the extra 2*d*. going to the supplier of the bullion. For the minting of his seignorage the king was the supplier, so in addition to £597 at face value he was paid £4 19*s*. 7*d*. for the shear.[27] Although recorded as separate sums it seems unlikely that they were counted out, for it would have been much easier for the king to be paid in minted sterlings with a total weight of 597 Tower pounds. Be that as it may, it is clear that the bullion was accounted in Tower pounds, which suggests that the moneyers who at that time were responsible for the purchase of bullion would have bought it by Tower weight.[28] If, as Dr Nightingale believes, there was a change in the thirteenth century from troy to Tower as the basis for such purchases,[29] it would have occurred no later than the introduction of the Long Cross coinage in 1247.

## Conclusion

It is fair to say, notwithstanding Dr Nightingale's arguments, that none of the mint documents in the *De Moneta* provides evidence that troy weight rather than Tower is intended in any of their references to pounds, ounces, pennyweights or grains and it is hard to disagree with a statement elsewhere by Dr Challis, admittedly when referring to an Irish act as late as 1483, that the only pound used in the London Mint was the Tower pound.[30] Undoubtedly the minting process itself was based on Tower weight and, as Dr Nightingale has indicated in personal correspondence, the parallel use in the mint of two weight systems, each with a pound of 5,760 grains, would have caused confusion.

Indeed, far from troy having been involved before 1279 for the purchase, assaying and alloying of bullion and its use then discontinued solely for the purchase of bullion, the considered opinion of two recent writers on the subject is that commercial pressure from the important markets of the Low Countries almost certainly led to its formal introduction in the late fourteenth century and its alignment with the ounce of the Bruges silver mark; before this time the principal ounce used in England was the ounce of Cologne, one of the principal European bullion markets.[31]

## APPENDIX

### THE FLEMISH SILVER MARK

Although a detailed discussion of continental weight-systems is beyond the scope of this note, it is necessary to mention the small marks of Flanders. Pegolotti refers to a Bruges silver mark of six ounces, which he indirectly equates with 128 sterlings of Tower weight,[32] and therefore the equivalent also of six English troy ounces. In Belgium, C. Wyffels has identified it with a silver mark first recorded in the eleventh century,[33] although not referred to as Flemish until 1164.[34] Furthermore, sources earlier than 1300 do not divide it into ounces but into four *fiertons*, each of four *lods*,[35] which points to a *lod* equal to eight sterling-weights. In the twelfth century there appears a *petit marc de 10s. sterling*, or *marca legitimorum sterlingorum, decem solidorum pro marcha*, which Wyffels interprets as a mark of sterling silver with a value of 120 sterlings.[36] Following advice from Grierson on

[27] Challis 1988, 84, citing PRO. E372/100 m.20.
[28] Mayhew 1992, 116–7.
[29] Nightingale 2008, 186.
[30] Challis 1992, 222.
[31] Simpson and Connor 2004, 328. For a recent major review of the subject, see Connor and Simpson 2004, 105–169 (Chapter 4: 'The Early Weights: A North European View').
[32] Combining the relationship between the Bruges gold and Bruges silver marks (Allen 1936, 237) with the Tower weight of the Bruges gold mark (p. 245) produces a Tower weight for the Bruges silver mark of $16/21 \times 168 = 128$ sterlings.
[33] Wyffels 1967.
[34] Wyffels 1967, 67–8.
[35] Wyffels 1967, 83.
[36] Wyffels 1967, 71–2.

English minting practice, he takes its value as implying that it would have weighed the same number of troy pennyweights, or half a troy pound,[37] in which case, *pace* Wyffels, it would have been the same as Pegolotti's silver mark of 128 sterling-weights [38] and would enable a further recorded mark, the *petit marc de x s. et viii d.*,[39] to be seen as yet another variant name.

A ratio of 128:120 between weight and value is equivalent to 256:240 and Dr Nightingale sees it as supporting her claim that in the twelfth century the king would have bought a troy pound of bullion of sterling fineness for a Tower pound of pennies, retaining the difference to cover his seignorage and minting costs.[40] It is circumstantial evidence and, by itself, does not prove that there was troy weight in England on which the *petit marc* could have been based.

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[37] Wyffels 1967, 72.

[38] Wyffels calculated the *petit marc* to be 3 grams lighter than the silver mark because he assumed that English troy had the same weight as French troy (Wyffels 1967, 73).

[39] Wyffels 1967, 70 (n.26) and 73.

[40] A difference of sixteen pence between the two weights of twelve ounces is brought out by Flemish silver weight, against twelve pence if the Paris or Troyes weight of Henry II's Angevin dominions is used instead: compare Nightingale 2008, 191.