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The Rise of the Gold Standard, 1660-1819

1663 May 19

Excerpt from the diary of Samuel Pepys, which gives an account of the processes involved in the manufacture of coinage at the Royal Mint using the new 'milled' method. Theoretically, the methods employed at the Mint were secret, and the publication of any description of the methods was forbidden, even though other countries using similar methods made no restrictions on publication. Owing to the proscriptions against the publication of production methods in England, however, Pepys' account is of especial interest.

19. [...] And thence with Sir John Minnes to the tower and by Mr. Slingsby and Mr. Howard [*recte* James Hoare], Controller of the Mint, we were shown the method of making this new money from the beginning to the end; which is so pretty that I did take notes of every part of it and set them down by themselves for my remembrance hereafter. That being done, it was dinner-time, and so the Comptroller would have us dine with him and his company, the King giving them a dinner every day; and very merry, and good discourse about the business we have been upon; and after dinner went to the Essay-Office and saw there the manner of assaying of gold and Silver, and how silver melted down with gold doth part again being put into aqua fortis, the silver turning into water [i.e., liquid] and the gold lying whole in the very form it was put in, mixed of gold and silver; which is a miracle - and to see no silver at all, but turned into water; which they can bring again into itself out of that water.

And here I was made thoroughly to understand the business of the fineness and coarseness of metals, and have to put down my lessons with my other observations therein.

At table, among other discourse, they told us of two cheats, the best I ever heard. One of the a labourer discovered to convey away the bits of silver cut for pence by swallowing them down into his belly, and so they could not find him, though of course they search all the labourers. But having reason to doubt him, they did by threatens and promises get him to confess, and did find 7l. of it in his house at one time.

The other, of one that got a way of coining money as good as passable and large as the true money is, yet saved 50 per cent to himself; which was by getting moulds made to stamp groats like old groats, which is done so well (and I did beg two of them, which I keep for rarities) that there is not better in the world; and is as good, nay better, than those that commonly go; which was the only thing that they could find out to doubt them by, besides the number that the party doth go to put off, and then coming to the Controller of the Mint, he could not, I say, find any other thing to raise doubt upon,

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but only their being so truly round or near it; though I should never have doubted that thing neither. He was neither hanged nor burned [i.e., the usual punishments for counterfeiting, which was considered high treason], the cheat was thought so ingenious and being the first time they could ever trap him in it, and so little hurt to any man in it, the money being as good as commonly goes. [...]

The most observables in the making of money which I observed today is in the steps of their doing it.

1. Before they do anything, they essay the Bullion - which is done, if it be gold, by taking an equall weight of that and of Silver; of each a small weight, which they reckon to be six ounces or half a pound Troy; this they wrap up in thin leade.

If it be Silver, they put such a quantity of that alone and wrap it up in lead; and then putting them into little earthen cupps made of Stuffe like tobacco pipes and put them into a burning hot Furnace; where after a while the whole body is melted and at last the lead in both is sunk into the body of the cup, which carries away all the copper or dross with it and left the pure gold and silver embodied together, of that which hath both [been] put into the cup together, and the silver alone in those where it was put alone in the leaden case. And to part the silver and the leade in the first experiment, they put the mixed body into a glass of boyling aqua fortis, which separates them by spitting out the silver into such small parts that you cannot tell what it becomes; but turns into the very water and leaves the gold at the bottom clear of itself, with the silver wholly spewed out; and yet the gold in the form that it was double[d] together in when it was a mixed body of gold and silver - which is a great mystery; after all this is done, to get the silver together out of the water is as strange.

But the nature of the Essay is thus. The piece of gold that goes into the Furnace, 12 ounces, if it comes out again, 11 ounces; and the piece of silver which goes in, 12, and comes out again 11 and 2 penny-weight, are just of the allay of the standard of England [i.e., $\frac{925}{1000}$ pure silver and $\frac{75}{1000}$ alloy]. If it comes out, either of them, either the gold above 11, as very fine will sometimes within very little of what it went in, or the silver about 11 and 2 pennyweight, as that also will sometimes come out 11 and 10 pennyweight or more, they are so much above the goodness of the standard; and so they know what proportion of worse gold or silver to put to such a quantity of the Bullion to bring to the exact standard. And on the contrary, [if] they comes out lighter, then such a weight is beneath the standard and so requires such a proportion of fine mettall to be put to the Bullion to bring it to standard. And this is the difference of good and bad, better and worse then the standard, and also the difference of standards, that of Sivill being the best and that of Mexico worse; and I think they said none but Sivill is better then ours.

2. They melt it into long plates; which, if the mould do take ayre, then that plate is not of equal heavynesse in every part of it, as it often falls out.

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3. They draw these plates between rollers, to bring them to an even thickness all along and every plate of the same thickness. And it is very strange how the drawing it twice easily between the rowlers will make it as hot as fire, you cannot touch it.
4. They bring it to another pair of Rowlers, which they call adjoustring - which brings it to a greater exactnesse in its thickness then the first could do.
5. They cut them into round pieces, which they do with the greatest ease, speed and exactness in the world.
6. They weigh these; and where they find any to be too heavy, they file them which they call Sizing them; or light, they lay them by; which is very seldom but they are of a most exact weight. But however, in the melting, all parts by some accident not being close alike, now and then a difference will be. And this fying being done, there shall not be any imaginable difference almost between the weight of 40 of these against another 40 chosen by chance out of all their heapes.
7. These round pieces having been cut out of the plates, which in passing the rollers are bent, they are sometimes a little crooked or swelling out or sinking in; and therefore they have a way of clapping a hundred or two together into an engine, which with a screw presses them so hard that they come out as flat as possible.
8. They blanch them.
9. They mark the letters on the edges, which is kept as the great secret by Blondeau (who was not in the way and so I did not speak with him today).
10. They mill them; that is, put on the marks on both sides at once, with great exactness and speed - and then the money is perfect.

The Mill is after this manner; one of the dyes, which hath one side of the piece cut, is fastened to a thing fixed below; and the other dye (and they tell me a payre of Dyes will last the marking of 10,000/. before it be worn out, they and all other their tools being made of hardened steel, and the Duchman [i.e., Roettier, probably John, the mint graver] who makes them is an admirable artist, and hath so much by the pound for every pound that is coyned, to find a constant supply of dyes) to an engine above, which is moveable by a screw which is pulled by men; and then the man with his finger strikes off the piece and claps another on; and then the other men they pull again and that is marked, and then another and another, with great speed.

They say that this is more charge to the King then the old way. But it is neater, freer from clipping or counterfeiting, the putting of words upon the edges being not to be done (though counterfeited) without an engine of that charge and noise that no counterfeit will be at or venture upon. And it imployes as many men as the other, and speedier.

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They now coyne between 16 and 24,000/. in a week.

At dinner they did discourse very finely to us of the probability that there is a vast deal of money hid in the land, from this:

That in King Cha[r]les's time time there was near 10 millions of money coyned - besides what was then in being of King James's and Queen Elizabeths, of which there is a good deal at this day in being.

Next, that there was but 750,000/. coyned of the harp and Cross-mony [i.e., Commonwealth coins, so-called from the English cross and the Irish harp on the reverse], and of this there was 500,000/. brought in upon its being called in, and from very good arguments they find that there cannot be less of it in Ireland and Scotland then 100,000/.; so that there is but 150,000/. missing; and of that, suppose that there should be not above 50,000/. still remaining, either melted down, hid or lost or hoarded up in England, there will then be but 100,000/. left to be thought to have been transported [i.e., taken abroad].

Now, if 750,000/. in twelve yeares time lost but a 100,000/. in danger of being transported, then 10,000,000/. in 35 Years time will have lost but 3,888,880/. and odd pounds. And as there is 650,000/. remaining after 12 years' time in England, so after 35 years' time, which was within this two years, there ought in proportion to have been resting 6,111,120/. or thereabouts besides King James and Queen Elizabeth mony.

Now, that most of this must be hid is evident as they reckon, because of the dearth of money immediately upon the calling-in of the State's money, which was 500,000 that came in; and yet there was not any money to be had in this City - which they say to their own observation and knowledge was so. And therefore, though I can say nothing in it myself, I do not dispute it.

Source: Latham and Matthews, eds., 1971, pp. 142-148.