

Monetae Cudendae Ratio
(“The Method of Minting Coins”)
Nicolaus Copernicus
(1526)

Although there are countless plagues by which kingdoms, principalities, and republics are accustomed to decline, yet these four (in my judgment) are the most powerful: discord, mortality, sterility of the land, and cheapness of money. The first three are so evident that no one is unaware that they are so, but the fourth, which concerns money, is considered by few and only the most courageous, because it does not overthrow republics with one blow, but gradually, by some hidden reason.

Now money is gold or silver stamped, by which the prices of things that can be bought and sold are counted according to the institution of each republic or of the ruler himself. Therefore money is like a certain common measure of estimates. But that which is a measure must always be firm and maintain a fixed measure. Otherwise it is necessary to confuse the organization of the republic, and buyers and sellers are defrauded in many ways, as if a cubit, a modius, or a weight does not maintain a certain quantity. Therefore, I consider this measure to be the estimation of the coin itself, which, although it is based on the goodness of the material, must nevertheless be distinguished from the estimation; for the coin can be valued more than the material of which it consists, and vice versa.

But the reason for the constitution of the coin is necessary; for although the exchange of things could have been done by the weight of gold and silver alone, from which gold and silver are everywhere held in value by common consent of men, nevertheless, because of the great inconvenience of always having to bring weights, and because the genuineness of the gold and silver is not immediately ascertained by all, it was established that the coin be stamped with a public seal, by which it is signified that the just quantity of gold or silver is contained, and that faith is given to the authority.

It is also customary to mix coinage, and especially silver, for two reasons (as I think), namely, that it may be less exposed to the plots of those who plunder and melt it down, which would be the case if it were made of genuine silver. The second, that the mass of silver, broken into small parts and scruples of coins, when mixed with ere, retains a suitable size: a third can be added, namely, that it does not wear out faster with continuous use, but that it persists longer with the support of ere.

Now a just and fair estimate of money is when it contains a little less gold or silver than is bought for it: as much as should be deducted for the expenses of the coiners. For the sign should add some dignity to the matter itself.

This is most often depreciated by excessive abundance, as if such a large quantity of silver has passed into money until the mass of silver is desired by men more than money: namely, in this way the dignity of money is lost, when with it it is not permitted to buy as much silver as the money itself contains, and a greater progress is felt when the silver in the money is destroyed, the remedy for which is to no longer mint money until it has equalized itself, and to make it more expensive than silver.

Value is also corrupted in many ways, either because of a defect in the material alone, namely when under the same weight of coin more eris than is necessary is mixed with silver, or because of a defect in the weight, although the eris has a just mixture with silver: or, which is worst, because of both at the same time; the value also decreases by itself and is worn out by long use, for which reason alone it must be restored and renewed. The sign of which is, if silver in the coin is found in a notable quantity less than that purchased for it, in which rightly is understood a shortage of coin.

Having explained the foregoing generally about coinage, let us descend specifically to Prussia, showing first how it came to such lightness. Now it passes under the names of marches, scots, etc., and there are also weights under the same names. For the march of weight is a half pound. But the march of numbers consists of 60 solidi: all of which are commonly known. But lest the equivocation of number and weight create obscurity, wherever the march is mentioned hereafter, it should be understood of the number; In the true name of the libre, the weight of two marks, for the selibra take the weight of the march.

We find therefore in ancient recesses and literary monuments that under the magistrate of Conrad of Jungingen, that is, just before the war of Taneberg, the selibra, that is, the march of pure silver, was bought for two Pruthenic marks and eight scots, when, namely, a quarter of eris was mixed with three parts of pure silver, and from half a pound of it they made 112 solidi. To which a third part is added, and there are 37 solidi and a third of one solidi, it makes the total sum of 148 solidi and two d. hanging on one libre bessem two thirds, that is, 32 scots of silver, which undoubtedly will contain three parts (and there are half a pound of pure silver). But it has already been said that its price was 140 solidi in selibra. The remainder, however, which was lacking in 9 solidi and a third, the estimate of the coin supplied. Therefore, its estimate was conveniently continued with the value.

Coins of this kind are those of Henry, Ulrich, and Conrad, which are sometimes still found in the treasuries. Then, after the defeat of Prussia and the aforementioned war, they appeared more and more in the currency. Henry's solidi, although similar in appearance to the aforementioned, are no longer found to contain more than three-fifths of silver. And this error grew until it was accepted in the reverse order that three parts of silver were mixed with one-fourth of silver, so that it was no longer more correctly called a silver coin, but a copper coin, yet it retained the weight of 112 solidi in the selibra. But since it is not at all appropriate to introduce a new and good coin while the old one remains cheaper, how much more was the error here while the old one remains better, and by introducing a new one that is cheaper, it not only corrupted the old one, but, so to speak, it conquered it. While under the magistrate Michael Rusdorff they wanted to counteract this error and restore the coin to its former better state, they minted new solidi which we now call grossos; But since the old, inferior ones did not seem capable of being abolished without loss, they remained together with the new ones, by a notable error.

And two old solidi were exchanged for one new one, and it then happened that a double march was imposed on the people, namely, the new solidi and the old ones. The new marchi

of the former, whether good, but the old or light, were sixty solidi in both places. But the oboli remained in their use. So that only six were exchanged for the old solidi, and twelve for the new one. For it can easily be conjectured that from the beginning there was a solid of twelve oboli. For just as we commonly call the number of fifteen a mandel, so in most German lands the word schilling lasts for the number twelve. But the name of the new solidi persisted until our memory: how they finally became coarse I will tell below.

Therefore, the eight marchi of the new solidi contained one pound of pure silver: which is sufficiently evident from their composition. For they consist of half an eris and the other half of silver, and their eight marchi of the sixth weigh nearly two pounds. The old ones, as has been said, are equal to them in weight, and in value by half; For when they had only a quarter of silver, they came in sixteen marks from a pound of pure silver, hanging four times. But later, when the state of the country changed, when the cities were granted the power to mint money, and they themselves were granted a new privilege, the money increased in quantity, but not in quality. And four parts of a fifth of silver began to be mixed with the old solidi until twenty marks were exchanged for a pound of silver. And so those new solidi, when they were now more than twice as good, were made scots with the new solidi, so that they were now counted as twenty-four light marches: therefore a fifth of the quality of the coin in the march was lost. But later, when the new solidi, now made scots, had disappeared because they had also been accepted by the Marches, it was decided to recall them at the valuation of grosses, that is, at three solidi, a great error and such a completely unworthy decision of the nobles, just as if Prussia could not exist without them, although they were no better than fifteen pence of the then current coin, where the multitude was already pressing on its valuation. Therefore, the grosses disagreed with the solids, being one-fifth or one-sixth less valuable than the established ones, and their fallacious and unfair valuation detracted from the dignity of the solids. Perhaps the injury should have been avenged in the same way as the solids had previously inflicted on the grosses and had forced them to become Scots. But woe to you, Prussia, and your sorrow!

You are paying the penalty of the destruction of your ill-administered republic. Therefore, with the valuation and value of money disappearing everywhere, the manufacture of money did not cease at all, and with expenses not sufficient to make the latter equivalent to the former, a worse one was always superimposed on the former, which oppressed and extinguished the goodness of the former, until the valuation of the solids came into proportion with the value of the grosses and 24 leva marks were given for one pound of silver.

But at least some remnants of such a valuable coin should have remained, since its restoration has not been contemplated. But the custom or license of adulterating, expiating, and defiling the coin, which has been in use for so long, could not cease, and does not cease to this day. For what it has become afterwards, and in what state it is now, I am ashamed and sorry to say. For it has fallen to such a low price today that 30 marks scarcely contain one pound of silver. But what remains if no help is given, except that henceforth Prussia, empty of gold and silver, should have a purely copper coin. Whence the importation of foreign goods, and all trades,

will soon perish. For which of the foreign merchants will wish to exchange his goods for copper coin?

Finally, which of our people in foreign lands will be able to purchase exotic goods with the same coin? Yet those who are concerned despise this great Prussian republican disaster and, after piety to God, they owe not only the greatest duty, but even life itself, they allow their most sweet country to slip and perish more and more by their supine negligence.

Therefore, since the Prussian currency suffers from such vices and through it the whole country, only goldsmiths and those who are skilled in the goodness of the metal enjoy its benefits. For they collect from the mixed money the old silver from which they sell the refined silver, always receiving more silver with the mixed money from the ignorant common people: but after those old solids have completely disappeared, the next best are chosen, leaving behind a worse pile of money.

Hence that common and perpetual complaint that gold, silver provisions, family wages, the labor of craftsmen and whatever is customary in human uses, surpass in value; but we do not consider, yawning, that the love of all things comes from the cheapness of the currency. For they increase and decrease also according to the condition of the coin: especially gold and silver, which we do not value as gold or copper, but as gold and silver. For we say that gold and silver are like the base of the coin on which its estimation is based.

But perhaps someone will argue that a cheap coin is more convenient for human uses: namely, it helps the poverty of men, makes provisions and other necessities of mortal life more easily available at a low price; but by means of a good coin everything is made more expensive, and the farmers and those burdened with the annual tax are burdened more than usual.

They will praise this opinion, hoping for private gain, to whom the power of minting coin has hitherto been permitted, and perhaps the merchants and craftsmen, who lose nothing on account of it, will disapprove of it, since they sell their goods and goods at the value of gold, and the more cheap the coin is, the more money they exchange them for. But if they look to the common good, they will certainly not be able to deny that a currency that is not only beneficial to the republic, but also to themselves and to the order of all men, is beneficial, but too little is harmful. Which, although it is quite clear for many reasons, we say is also true from experience itself, the master of things: for we see that those countries flourish most of all that have good currency, but decline and perish that use worse: Prussia flourished when one Pruthenic mark was bought for two Hungarian florins and when, as has been said, two Pruthenic marks and eight Scots' selibra, that is, a pure silver mark, were exchanged. Meanwhile, however, as the currency became more and more worthless, our country was reduced to a state of near ruin by this plague and other calamities.

It is also clear that the very places that use good money are endowed with excellent arts and craftsmen and an abundance of goods; and on the contrary, where cheap money is in use,

laziness, idleness and abject idleness neglect the cultivation of both good arts and talents, and also the abundance of all things perish. It is not yet beyond the memory of men that grain and provisions were bought for a smaller amount of money in Prussia when good money was still used. But now, as it becomes worthless, we experience that the price of all things that pertain to sustenance and human use rises. From which it can be clearly seen that a light money feeds idleness rather than helps the poverty of the people; nor can the elevation of the money greatly burden the tax collectors, who, if they seem to depend more on their own dominion than usual, will sell the fruits of the land, cattle and such things of theirs at a higher price. For the reciprocal exchange of giving and receiving will be compensated by a measure proportionate to the money.

If, therefore, it is at last desirable to restore the hitherto disastrous Prussian coinage, the confusion arising from the variety of different workshops in which it is to be minted must be avoided first of all. For multiplicity prevents uniformity and it is a greater problem to maintain more workshops in the duty of rectitude than one.

Two places, therefore, at most, shall be designated: one in the lands of His Majesty; the other in the prince's jurisdiction. In the first, a coin shall be minted which on one side shall be marked with the royal insignia, and on the other with the lands of Prussia. In the second workshop, however, it shall be marked with the royal insignia on one side, and with the prince's coinage on the other, so that both coins shall be subject to the royal authority and, by His Majesty's command, shall be in use and accepted throughout the kingdom. Which thing will have no small weight for the conciliation of minds and the communion of transactions.

The value of the work shall be that these two coins shall be of the same grain, value and estimation, and shall be pressed with vigilant care in the republic according to the ordinance now to be instituted, and shall continue in perpetuity. And that the princes on both sides should not feel any profit from the minting of money, but only so much is added that the estimate itself exceeds the value, so that the loss of expenses can be repaired and the opportunity of minting money is taken away.

In order that we may not fall into the confusion of our time which the mixing of new and old coins has produced, it seems necessary that when the new one comes into being, the old one should be abolished and completely destroyed, and exchanged in the factories for the new one according to the proportion of its value. Otherwise, the work of renewing the coin will be in vain, and the subsequent confusion will perhaps be worse than the previous one. For the old one will again taint the dignity of the new coin: indeed, the mixture will yield a sum that is deficient in its just weight and excessively multiplied, which will result in the inconvenience mentioned above. If anyone still thinks that this should be avoided by this, namely that the remaining old coins should be valued at so much less in comparison with the new coin as their value is worse or more insignificant; but this cannot be done without great error. For there is now such a manifold diversity, both of grossi and solidi, and also of denari, that individual coins could hardly be valued according to the condition of their value and distinguished from one another. Wherefore the introduced variety of money would generate

inextricable confusion, and would increase labor, trouble, and other inconveniences to those who trade and contract. Therefore it will always be better to abolish the old money entirely in the restoration of the new. For it will be necessary to suffer a little loss once and for all, if only it can be said to be a loss from which a more abundant fruit and a more constant utility are born and the republic grows.

But it is very difficult to raise the Prussian money to its former dignity, and perhaps impossible after such a fall; then any restoration of it would be a matter of no small business, yet for the conditions of these times it seems that it can be conveniently renewed, so that it returns at least to 20 marks a pound of silver, in this way: for solidi three pounds of eris are taken, but one pound of pure silver less half an ounce or as much as must be deducted for expenses. A mass is made from which 20 marks are made, which in purchase will be worth one pound, that is, two marks of silver. By the same token, scots or grosses and obols can also be made, as may be desired.

It has been said above that gold and silver are the basis on which the goodness of money resides. And what has been explained about silver money can also be referred for the most part to gold. It remains to explain the ratio of exchanging gold and silver from the opposite side. First, therefore, it is necessary to investigate what is the ratio of appreciation of pure gold to pure or pure silver: so that we may descend from genus to species and from simple to composite. Furthermore, the ratio of gold and silver in shapeless form is the same as that of stamped gold in the same degree, and again the same ratio of stamped gold to shapeless form, as of stamped silver to shapeless silver under the same degree of mixture and weight. But the purest gold that is found stamped among us are the Hungarian florins; for these have the least amount of admixture and only perhaps as much as was necessary to deduct for expenses in the mints, whence they are duly exchanged for pure gold under the same weight, the dignity of the seal making up for the deficiency of the florins. It follows, therefore, that the ratio of pure, shapeless silver to gold is the same. Pure formless and of the same silver to Hungarian florins, the weights not changed, but 110 Hungarian florins of equal and just weight by grains, namely 72, fill one pound (I always understand a pound which contains two marks of weight).

By this argument we find that in common with all nations one pound of pure gold is worth only as much as 12 pounds of pure silver. We also find that 11 pounds were once for one pound of gold, for which reason it seems to have been established from ancient times that 10 Hungarian gold coins weigh one eleventh part of a pound: and if the same price were to last under that weight today, we would have an easy conformity with the Polish and Pruthenian coins according to the explained ratio: for if about 20 marks were made from one pound of silver, they would come out exactly for two gold marks, instead of 40 Polish groschen.

But after it has been accepted that twelve parts of silver are for one part of gold, the weight will be at variance with the price, so that ten Hungarian gold coins will redeem one pound of silver and eleven parts of a pound. Therefore, if twenty marks are made from a pound of silver and its eleventh part, the Polish and Prussian coins will be in the right proportion, gross

for gross, and two marks for a Hungarian gold coin. But the price of silver will be eight marks and ten solidi for each selibra, or about that. But if of course the cheapness of the country and the destruction of the country pleases and such a large restitution and adjustment will seem too difficult, and it will be seen that fifteen Polish grosses remain for a march, and two Scots for a Hungarian gold coin sixteen marks; this too will be done without great difficulty in the ways already mentioned, if twenty marks are made from a pound of silver.

This indeed happened recently when twelve marks were still the price of each silver coin and Hungarian florins were exchanged for so much money. Here they are said for the sake of example and for the sake of guidance. For there are infinite ways of establishing a currency, and it is not possible to explain them all, but common consent, by mature deliberation, will be able to define this or that, as will seem most convenient for the republic. But if the currency is rightly related to the Hungarian florin and there has been no error, other florins will easily be taxed according to the content of gold and silver in comparison with them.

It is sufficient to have said this about the restoration of the currency, so that it may be understood in what ways its dignity has fallen and how it can be restored, which I hope is clear from what has been said above.

Regarding the restoration and preservation of the coin, the following considerations seem to be necessary: First, that no coin be minted without the mature advice and unanimous decree of the nobles. Second, that only one place be designated as the mint, if possible, where it would be minted not in the name of a single city, but of the entire land with its insignia, the effectiveness of this decision being demonstrated by the Polish coinage, which alone retains its value in such a vast area of land. Third, that the publication of a new coin be prohibited and the old one abolished. Fourth, that it be observed inviolably and immutably forever that only twenty marks and no more be minted from one pound of pure silver, after deducting what must be deducted for the expenses of the mintage. Namely, the Prussian coinage will be proportioned to the Polish one, so that twenty Prussian and Polish groschens together constitute a Prussian mark. Fifth, that an excessive amount of coinage be avoided. Sixth, that the coinage should be produced in all its forms at the same time: that is, that scots or grossi, solidi and oboli should be minted equally. But as to the extent of the admixture, whether grossi and solidi should be made, or even silver denarii worth a ferton or a half march or even a whole one, it is at the pleasure of those who are interested; unless there is a limit and it is so decided that it will remain in perpetuity for the future. Account must also be taken of oboli, how they are now worth very little, so that a whole march contains scarcely more than one grossi's worth of silver. The last difficulty arises from contracts and obligations made before and after the innovation of the coinage, in which a limit must be found so that the contracting parties are not overburdened; as was done in ancient times, as is clear from what is described on the other side of this folio.