

The Tower Press-Room, 1695-1727

Recoinage, Standard, and the Warden's Prosecutions

Joseph Smith

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Preface. The Tower press-room

In the second year of the Great Recoinage, in the summer of 1697, the Mint at the Tower of London operated on a schedule that had no precedent in the office's records. The rolling mills, cutting presses, and coining presses ran from four in the morning until midnight, three shifts of moneyers turning out crown, half-crown, shilling, and sixpence pieces. The returns measured bags of blanks, pounds troy of fine silver, and ounces short in the assay against the standard the House of Commons had fixed in December 1695. Newton read the tallies as warden and recorded their results; moneyers, horse-minders, assayers, and clerks produced

the coin whose surviving accounts bear his name most visibly.¹

The situation the presses answered was neither obscure nor recent. Since the Restoration, the silver currency of England had suffered progressive attrition by clipping, and by the middle 1690s the coin in ordinary circulation weighed, on Lowndes's own sampling, not much above half what it professed to weigh. The consequence was disorder in every mercantile settlement, disorder in the pay of soldiers and sailors abroad, and disorder in the balance between the domestic price of silver and its bullion price on the continent. A guinea, tariffed at twenty-two shillings by proclamation, exchanged in London for as much as thirty. Merchants shipped good silver abroad; the coin left in the kingdom's shops and pockets was the clipped remnant no exporter would take. The Treasury faced a physical, not a fiscal, problem: a currency composed of pieces that had lost their metal.²

Parliament's answer was to withdraw the currency and re-strike it at the old weight and fineness. That was not the only proposal on the table. William Lowndes, secretary to the Treasury, argued in his September 1695 report that the currency should be re-struck at a lower weight, a reduction of about a fifth, which would spare debtors, slow the export of silver, and bring the coin into line with the market price of the metal. John Locke, in a rejoinder published within weeks, argued that the standard was not the Treasury's to alter, that Parliament held it in trust, and that the crown should re-strike at the old weight and let the loss fall where the clipping had already put it. The vote in December 1695 followed Locke. The Mint's schedule for the summer of 1697 was the consequence.³

Around the machinery ran a second operation, less visible in the account books because it required none. The warden of the Mint, an office recently converted from a nominal patent to an active jurisdiction, prosecuted counterfeiters and clippers under the King's Bench. Newton took depositions from informers, corresponded with the Attorney General, and pressed indictments; the watching itself was the work of informers, paid watchmen, and parish constables, not of the warden in person. The pursuit of the counterfeiter William Chaloner, from 1697 to March 1699, became, a century after Newton's death, the material of a popular literature that named Newton a detective. The depositions do not sustain the detective; they sustain the warden, and the network of informers and officers whose watching he is often credited with doing himself.⁴

¹"Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)," University of Oxford, 2016, <https://newtonandthemint.history.ox.ac.uk>; John Craig, *Newton at the Mint* (Cambridge University Press, 1946); Ming-Hsun Li, *The Great Recoinage of 1696 to 1699* (Weidenfeld and Nicolson, 1963).

²William Lowndes, *A Report Containing an Essay for the Amendment of the Silver Coins* (Charles Bill and the executrix of Thomas Newcomb, 1695), <https://archive.org/details/reportcontaining00lowndes>; Li, *The Great Recoinage of 1696 to 1699*; Christine Desan, *Making Money: Coin, Currency, and the Coming of Capitalism* (Oxford University Press, 2014).

³Lowndes, *A Report Containing an Essay for the Amendment of the Silver Coins*; John Locke, *Further Considerations Concerning Raising the Value of Money* (A. and J. Churchill, 1695), https://archive.org/details/bim_early-english-books-1641-1700_further-considerations-c_locke-john_1695_0; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

⁴University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Thomas Levenson, *Newton and the Counterfeiter: The Unknown Detective*

Two decades on, in September 1717, the master submitted to the Treasury a short report on the ratio between gold and silver. Its immediate purpose was administrative: it lowered the tariff of the gold guinea from twenty-one shillings and sixpence to twenty-one shillings. Its consequence was not administrative. The guinea, still overvalued at the new tariff against its market price in gold, remained more profitable to hold and spend at home than to melt for export; silver, undervalued at the same tariff, remained more profitable to ship abroad than to spend at home. By the second quarter of the eighteenth century the silver currency had largely emigrated, and the gold guinea, by attrition rather than design, had become the effective standard of English payments. The historiography that later named this arrangement the gold standard did not descend from the 1717 report as from a founding text; it descended by administrative accident from a note the master had thought he was writing about a shilling and sixpence.⁵

The reconstruction draws on four bodies of evidence: the Mint's own administrative papers at The National Archives, catalogued under MINT 15 (the warden's papers) and MINT 19 (Newton's papers); the University of Oxford's Newton and the Mint transcription project and the Newton Project's edition of the master's memoranda and correspondence, which supply the operative texts; the Royal Mint Museum's collections at Llantrisant, for machinery and specimen questions; and a secondary literature anchored in John Craig's *Newton at the Mint* (1946) and *The Mint* (1953), Ming-Hsun Li's *The Great Recoinage of 1696 to 1699* (1963), Thomas Levenson's *Newton and the Counterfeiter* (2009), Christine Desan's *Making Money* (2014), and Artemis Manolopoulou's 2022 article in *Notes and Records of the Royal Society*.⁶

The crisis and its aftermath ran in four acts. Lowndes and Locke fought first over where the clipping loss should fall. The Great Recoinage followed, an industrial throughput problem the Mint's peacetime organisation had never been built to solve. Alongside the presses ran the warden's jurisdiction over the counterfeiters and clippers the recoinage was meant to stop. The 1717 report on the gold-silver ratio, an administrative note that set the terms of a monetary settlement its author did not name, closed the sequence; what survived Newton's death, and what did not, measures the office he left. And beside the Mint's metal answer to the 1690s disorder ran the Bank of England's paper one, from the start: two answers, both kept.

Career of the World's Greatest Scientist (Houghton Mifflin Harcourt, 2009); "MINT 15: Warden's Records, Prosecutions and Depositions," The National Archives (UK), 1696.

⁵University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Artemis Manolopoulou, "The Science of Money: Isaac Newton's Mastering of the Mint," *Notes and Records of the Royal Society* 76, no. 3 (2022): 507–28; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

⁶"MINT 19: Newton Papers," The National Archives (UK), 1696; "MINT 15: Warden's Records, Prosecutions and Depositions"; University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; "The Newton Project," University of Oxford, 2006, <https://www.newtonproject.ox.ac.uk>; "Royal Mint Museum: Catalogue and Research Collection," Royal Mint Museum, 2024, <https://www.royalmintmuseum.org.uk>; Craig, *Newton at the Mint*; John Craig, *The Mint: A History of the London Mint from A.D. 287 to 1948* (Cambridge University Press, 1953); Li, *The Great Recoinage of 1696 to 1699*; Levenson, *Newton and the Counterfeiter: The Unknown Detective Career of the World's Greatest Scientist*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Manolopoulou, "The Science of Money: Isaac Newton's Mastering of the Mint."

Chapter 1. Act One, 1695: Lowndes's Essay and the clipping crisis

William Lowndes was fifty-three years old in September 1695, secretary to the Treasury under Charles Montagu, and a career official whose knowledge of the coinage was closer to the counting-house than to the schools. His *Report Containing an Essay for the Amendment of the Silver Coins* was delivered to the Lords Justices of the Regency, who governed while King William was in Flanders, and printed at London for public consideration by Charles Bill and the executrix of Thomas Newcomb. It runs to one hundred and sixteen quarto pages, of which the first sixty rehearse the physical condition of the silver currency and the last forty argue a remedy. It reads as an administrator's brief, not a scholar's treatise; but its diagnostic pages remain the closest reading of the 1690s currency by anyone in office.⁷

The physical condition was as follows. The silver coin of the kingdom had been struck at a fixed weight and fineness since Elizabeth's proclamation of 1601, which coined sixty-two shillings from one troy pound of sterling silver: a shilling of ninety-two and nine-tenths grains, or three pennyweights and twenty-one grains on the Mint's reckoning of twenty-four grains to the pennyweight. The old hammered pieces from the Tudor and Stuart reigns circulated alongside the milled coin of the Restoration, which was rimmed with a lettered edge to defeat the clipper's file; the hammered pieces had no such rim. By 1695 the milled coin had largely disappeared from ordinary circulation, either hoarded or exported as bullion. The coin left in the market was overwhelmingly the older, unmilled sort, and it had been shaved on every transit until the ordinary shilling weighed, on Lowndes's own bagged samples, not much above half the statutory weight. In plain terms, the coin was a token of about half its face.⁸

The consequence was chaos in the ordinary machinery of payment. Merchants weighed coin rather than counting it, and a shilling was worth its actual metal, not its impressed value. Excise farmers refused clipped money at the crown's rated value; the excise commissioners refused the farmers' remittances at any but their own valuation; the sheriffs, at the sessions, took what they could and remitted less. The army in Flanders required specie of a weight the domestic currency could not supply, and the paymasters bought good silver on the London market at a premium, or drew bills on Amsterdam and Hamburg at rates reflecting the guinea's inflated London value rather than any settled tariff. The guinea itself, coined in gold from 1663, had been proclaimed at twenty-two shillings by the mid-1670s and had drifted upward against the shilling as the shilling lost its metal; by August 1695 it was passing in London at as much as thirty shillings, and in the country at higher rates still.⁹

The criminal side of the disorder was less regulated than the excise side. Clipping was a capital felony, treated as a form of the ancient treason of counterfeiting the King's money;

⁷Lowndes, *A Report Containing an Essay for the Amendment of the Silver Coins*; Li, *The Great Recoinage of 1696 to 1699*.

⁸Lowndes, *A Report Containing an Essay for the Amendment of the Silver Coins*; Li, *The Great Recoinage of 1696 to 1699*.

⁹Lowndes, *A Report Containing an Essay for the Amendment of the Silver Coins*; Li, *The Great Recoinage of 1696 to 1699*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

but conviction required a jury's finding that a defendant had, of his own act, reduced the metal of a specific coin, and the coins prosecuted travelled anonymously through every hand in the market. The assize courts convicted a scattering of clippers in each circuit through the early 1690s, and hangings at Tyburn and the county towns were regular; the volume of clipped coin continued to grow regardless. A Bristol jury in 1694 convicted six for clipping and coining; a Yorkshire jury convicted eight the same year. The convictions did not reduce the flow because the offence had become industrial: small shops in the alleys off Aldgate and along the Southwark bank operated as clipping houses, buying good coin from tavern-keepers and river porters, shaving it, and re-issuing it with the file marks disguised by the wear of ordinary handling. The Bank of England, chartered in July 1694, had already begun refusing clipped coin at its counter; its first-year deposits came in at a mixture its clerks had to weigh, not count.¹⁰

Lowndes treated the criminal question in one paragraph and passed to the fiscal. He proposed that the recoinage, whatever weight it settled on, be accompanied by a proclamation withdrawing clipped coin at a stated deadline, after which unclipped coin would circulate at the new tariff and clipped stock would be received by the Mint at metal weight only. The proposal implied that the crown would bear the loss between the nominal value of the currency withdrawn and the metal weight of what was returned, and that a substantial part of that loss corresponded to the profit of the clippers themselves, already dissipated in the market. On this point Lowndes was neither confident nor confused: he wrote that the clippers had "already had the benefit of their frauds," and that the loss on the crown's books was the arithmetic residue of a crime already committed, an accountant's statement of what the crown could and could not recover.¹¹

Lowndes assembled the diagnosis with the patience of an accountant. He tabulated bagged samples of coin remitted to the Exchequer from receivers in twelve counties, and reported an average shilling weight of roughly half the statutory three pennyweights twenty-one grains. He tabulated the guinea's country rate against the silver tariff by month for the past three years, and showed the gap widening. He tabulated the price of bar silver at the Mint (five shillings twopence per ounce at the standard weight) against its market price in London (five shillings eightpence, and rising), and showed that at the Mint's tariff no bullion dealer would bring silver to be coined; the coin would be lighter as an ingot than the ingot itself was worth. The Mint had struck almost no silver from 1690 through 1694; the presses stood idle while the currency dissolved.¹²

The remedy followed from the diagnosis. The market price of silver had risen, Lowndes argued, so the coin ought to be re-struck at a weight consonant with the market: the metal in the shilling reduced by about a fifth, to somewhere near seventy-four grains against the old ninety-three, with the crown, half-crown, sixpence, and other denominations re-struck

¹⁰Li, *The Great Recoinage of 1696 to 1699*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Craig, *Newton at the Mint*.

¹¹Lowndes, *A Report Containing an Essay for the Amendment of the Silver Coins*.

¹²Lowndes, *A Report Containing an Essay for the Amendment of the Silver Coins*; Li, *The Great Recoinage of 1696 to 1699*.

at proportionate weights. The face value of the coinage would be preserved (a shilling would still be called a shilling), but its silver would not. The saving to the Treasury would be about a fifth of the value of the recoin stock, applied against the shortfall between the nominal value of the currency to be re-struck and the physical weight of the clipped pieces the Treasury would receive.

The proposal is best read as three claims of unequal robustness. The first is the diagnostic claim: that the clipping had already reduced the ordinary currency to roughly half its statutory metal. That claim was, and is, correct, and it is the part of Lowndes's essay to which even his sharpest critics later gave assent. The second is the fiscal claim: that a re-strike at the reduced weight would spare the Treasury the loss the alternative course would inflict. That claim was arithmetically true given the physical situation, though it framed the loss as a Treasury problem rather than a private one, and buried the fact that holders of clipped coin would be paid at the reduced tariff for coin they had received at the old. The third is the economic claim: that a lighter coin would bring the domestic price of silver into line with the market, halt the export of good silver, and restore the Mint to operation. That claim was contested at the time and remains contested in the historiography.¹³

Ming-Hsun Li, in his 1963 monograph, judged Lowndes's diagnostic pages closer to the operating condition of the market than the arguments Locke would deploy against them. A re-strike at the old weight, Li showed, would require the Treasury to buy silver at a bullion price several pence above the Mint's tariff, leaving a permanent gap between the Mint's incentive to strike and the market's supply. That gap is Li's standing explanation for the near-cessation of silver coinage after 1699: the Mint could not attract silver at its own statutory tariff, and by 1720 the recoinage silver had begun to emigrate as merchants bought it at face and sold it as bullion. On this reading the debate of 1695 was decided against Lowndes at the cost of a silver currency that could not be replenished.¹⁴

The counterreading, which begins with Locke and continues through Christine Desan's 2014 study, defends the parliamentary decision on grounds Lowndes's fiscal arithmetic missed. Desan argues that the standard is a public commitment of the coining authority, and that a re-strike at reduced weight is not a re-strike but a renegotiation of the terms on which private wealth denominated in coin will be honoured. Lowndes had counted the loss on one side of the ledger only: the debtor whose clipped shilling was revalued at four-fifths of a shilling would not discharge his obligation at four-fifths of its nominal amount, but would lose the fifth in the settlement, or force the creditor to extract it some other way. The disagreement between Li and Desan turns on which loss counts: the loss to the currency, which could not be replenished at the Mint's tariff, or the loss to the credit system, redistributed unevenly among debtors and creditors. Neither reading supports the rhetorical use later made of the essay, which cast Lowndes as an early inflationist and Locke as a defender of sound money. Lowndes's own language was an accountant's, not a projector's: he wrote of aligning the

¹³Lowndes, *A Report Containing an Essay for the Amendment of the Silver Coins*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Li, *The Great Recoinage of 1696 to 1699*.

¹⁴Li, *The Great Recoinage of 1696 to 1699*.

coin with “the true and intrinsic value of silver,” a phrase that would not have consoled a debtor but proposed no manipulation of the market either.¹⁵

The political situation gave the essay’s reception a shape the arithmetic alone would not have produced. King William was at the Flanders siege of Namur through the late summer of 1695 and returned to London only in October, after Namur’s capitulation and a general election that returned a Whig-dominated Commons. Charles Montagu, thirty-four and a rising Whig, had entered the Treasury the year before as First Commissioner and was the architect of the Bank of England’s 1694 charter. He was also Newton’s former colleague at Trinity, and their correspondence through the summer of 1695 preserves the standard framing Newton would carry into the Mint the following year. A partial devaluation proposed by Montagu’s own Treasury Secretary reached the House at a moment when Montagu could not accept it without appearing to convert the Bank’s paper credit into a means of writing down the Bank’s own settlements at the counter. Locke’s *Further Considerations* was in press at Awnsham Churchill’s shop by the middle of November.¹⁶

Parliament heard Lowndes read to the Commons in December 1695; the reading is recorded in the *Journals of the House of Commons* for the eighth and ninth of that month. A committee of the whole House considered the essay through the middle of December and reported on the seventeenth, resolving (by a margin the *Journals* do not preserve) that the currency should be re-struck at the old weight and fineness, and that the Treasury should sustain the loss. Locke’s *Further Considerations* was in members’ hands through the debate. On the twentieth of December the Commons passed a bill authorising the recoinage; the King’s assent by commission carried it into statute the next day, before Christmas.¹⁷

The Treasury had not yet decided how the loss would be met. Lowndes’s essay had estimated it, between the nominal value of the clipped currency at old weight and the actual metal to be received, at somewhere between two and three million pounds, a sum equivalent to a normal year’s excise revenue and a quarter of the state’s peacetime budget. Parliament spent the winter and spring of 1696 assembling the means to sustain it: a window tax of two shillings a house, with additional shillings on houses of more than ten windows, from April 1696, filled out with lotteries and excise supplements. The recoinage was funded on the taxable capacity of the state as a physical operation, not as a fiscal manoeuvre.¹⁸

Two things had happened. Parliament had settled a monetary question by legislative act, on the terms of a scholar’s brief rather than an official’s. And the settlement had produced a physical problem the Mint would have to solve: the currency to be re-struck was clipped, the silver to be received was priced above the Mint’s tariff, the presses had stood idle for years,

¹⁵Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Lowndes, *A Report Containing an Essay for the Amendment of the Silver Coins*.

¹⁶Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Craig, *Newton at the Mint*; Locke, *Further Considerations Concerning Raising the Value of Money*.

¹⁷Locke, *Further Considerations Concerning Raising the Value of Money*; Craig, *Newton at the Mint*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

¹⁸Li, *The Great Recoinage of 1696 to 1699*; Craig, *Newton at the Mint*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

and the machinery of receiving, weighing, assaying, and re-striking a national currency had never been operated at the scale the statute now required. Newton, at the beginning of 1696, was in Cambridge and was not yet warden of the Mint; Montagu had not yet asked him to take the office, which Thomas Neale still held as a projector more interested in his lotteries than in the coining trade. The Commons had passed a bill; someone would have to run the presses.¹⁹

Chapter 2. Act One, 1696: Locke's Further Considerations and the standard held

John Locke's *Further Considerations Concerning Raising the Value of Money* was printed at London for Awnsham and John Churchill in November 1695, carrying that imprint date, though it circulated among members of the Commons through the first three weeks of December, ahead of the committee report of the seventeenth. It was a rejoinder to Lowndes rather than an independent treatise, running to some 197 octavo pages, of which the first hundred are a close, sometimes contemptuous, dissection of Lowndes's paragraphs, and the remainder an argument for the position Locke had already published in his *Considerations of the Consequences of the Lowering of Interest, and Raising the Value of Money* of 1691. Locke was sixty-three, a commissioner of the Board of Trade in nomination if not yet appointment, and the intellectual authority to whom Montagu had turned when the Whig ministry required a philosophical answer to Lowndes's fiscal one.²⁰

Locke's central argument stood on a distinction between two ways of describing the coin. The coin, he wrote, is silver of a fixed weight and fineness stamped with the King's mark; its value in trade derives from its metal, not its stamp. To alter the weight of a shilling by proclamation, and still call the lighter coin a shilling, does not change the value of silver; it only changes what the crown chooses to call silver. "Silver is measured by its own weight," Locke wrote, and no proclamation can make less silver equal more. A shilling coined at reduced weight and called a shilling purchases only what its metal will purchase; debts denominated in the old shilling will be settled at the metal-weight ratio, and the settlement will be a partial one. On this view, Lowndes's proposal was not a re-tariffing of the coin but a partial default by the crown on the coinage as a public commitment.²¹

The distinction is philosophical in one register and constitutional in another. Philosophically, Locke maintained that the coin is a natural object measured by nature's laws (the weight of silver as it exchanges against any other commodity), which no public authority can alter by fiat; the crown can stamp a piece of metal, but it cannot make the metal weigh more than it weighs. Constitutionally, he maintained that Parliament had, by long practice, established a silver standard whose terms private contracts had incorporated, so that altering those terms is an act of legislation, not an administrative adjustment by proclamation of the King in

¹⁹Craig, *Newton at the Mint*; Li, *The Great Recoinage of 1696 to 1699*.

²⁰Locke, *Further Considerations Concerning Raising the Value of Money*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

²¹Locke, *Further Considerations Concerning Raising the Value of Money*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

Council. Both registers are present throughout the essay, but the second registered more strongly with the Commons, which was being asked to authorise legislation rather than to ratify a Treasury circular, and Locke's phrasing invited members to see themselves as trustees of a public commitment rather than executors of a Treasury proposal.²²

Where Lowndes counted the loss on the crown's books, Locke counted it on private accounts. A debtor who had borrowed a hundred pounds at the old standard and repaid a hundred at the Lowndes standard would repay in metal about eighty pounds; the creditor would lose twenty pounds by the operation of a proclamation, not by consent. That arithmetic touched every long-dated loan, rent-charge, annuity, and settlement of dower, and the whole of the funded debt of the state, by 1695 some six or seven million pounds. The crown, Locke argued, could not alter these terms by altering the coin without a legislative act directed at each instrument; the fairer course, painful as it was, was to sustain the loss fiscally, where the crown could raise taxes to cover it and the burden fell on the nation's taxable capacity rather than on individual creditors' balance sheets.²³

The argument is easier to state than to defend on economic grounds. Ming-Hsun Li showed that the fiscal cost of Locke's position exceeded that of Lowndes's by the entire metal-weight difference of the recoin stock (some two and a half million pounds to the exchequer) while transferring to creditors a valuation increment equivalent to perhaps a fifth of the outstanding long-term debt, and that the resulting deflation fell disproportionately on debtors whose obligations had been contracted at clipped-era prices. Li's language is that of an accountant, not a partisan: Locke's position was fiscally more expensive and privately more redistributive than the alternative. Christine Desan's 2014 reading does not dispute Li's numbers but treats them as beside Locke's point. Locke argued that the coinage is a constitutional commitment of the crown to the contracts denominated in it, so any alteration is by definition an alteration of those contracts; to weigh the fiscal cost of preserving the commitment against the cost of breaking it is already to have conceded the question the constitutional argument asks. On Desan's reading the deflation and disrupted balance sheets Li documents are not the cost of Locke's position but the consequence of the clipping crime itself, a reckoning suspended while clipped coin passed at face and arriving only when the currency was drawn in and re-struck at the standard.²⁴

The two readings do not converge. What neither disputes is that Locke's argument, whatever its economic character, carried the Commons. The vote of December 1695 was not a vote to bear a cost denominated in Li's terms; it was a vote to preserve the character of the coin as a public commitment, the cost accepted as the incidental price of preservation. Whether the members understood the arithmetic as Li would later reconstruct it, or as Desan would, is a question the *Journals* do not settle; the vote is recorded, the reasoning behind it is not.²⁵

²²Locke, *Further Considerations Concerning Raising the Value of Money*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

²³Locke, *Further Considerations Concerning Raising the Value of Money*.

²⁴Li, *The Great Recoinage of 1696 to 1699*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

²⁵Locke, *Further Considerations Concerning Raising the Value of Money*; Li, *The Great Recoinage of 1696 to 1699*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

Peter Laslett, in his 1960 edition of the *Two Treatises*, drew attention to Locke's letters of the period, which treat the coinage question as continuous with the political philosophy of the *Second Treatise*: money is a convention entered by consent, its terms are the trustee's to maintain rather than alter, and the crown's power over the coin is fiduciary, like its power over the laws. Contemporaries in the Board of Trade and the Whig ministry received the *Further Considerations* on those terms, as a philosophical statement of the character of money rather than a piece of fiscal advice, which helps explain its disproportionate influence: it recruited the language of trusteeship and consent to a technical question and made the technical question constitutional, in a way a purely fiscal argument from Lowndes could not have managed however sound its arithmetic.²⁶

A political element entered as well. The session of December 1695 was the first of a new Commons dominated by the Whig junto, less inclined than an established administration to accept a proposal from a Treasury official whom Montagu had already, in effect, disowned. The Tories had no fondness for a proposal that would benefit an unspecified class of debtors while cutting the currency's metal; the country members, largely landed, saw in Locke's argument a defence of rents and long settlements against a currency-driven writedown. The recoinage bill passed the Commons on the twentieth of December, passed the Lords the same week, and received royal assent by commission on the twenty-first, with no division recorded in the *Journals*. Parliament had chosen Locke's answer, whether or not every member who voted for it had followed Locke's argument to its philosophical root.²⁷

Locke's prose, particularly in its first fifty pages, is closer to Restoration polemic than to the ordered exposition of the *Essay Concerning Human Understanding*. He quotes Lowndes at length, restates the quotation in his own paraphrase, and answers the paraphrase; the impression left is of a philosopher visibly annoyed at an official's incursion into a subject he had already claimed. Members who had read the *Two Treatises* and the *Essay* were now reading Locke arguing that Lowndes had confused the coin with the metal in the coin, a confusion Lowndes's plain fiscal arithmetic could not answer in kind. Locke's claim that silver is measured by its own weight is not exactly a monetary theory; it is an ontological claim about what silver is. A "shilling" of less silver is not a shilling but a lighter piece whose stamp lies. Where Lowndes wrote of "the intrinsic value of silver" and "the market price of bullion," Locke wrote of silver itself and refused to name a market whose fluctuations could be authoritative for the coinage. It is not, in modern economic terms, a correct position; it is the position that carried December 1695.²⁸

Between the vote and the summer of 1696, an office had to be filled. Thomas Neale, master of the Mint, was a projector whose interest ran to the lotteries he had promoted through the 1690s rather than to the coining trade; he was suspected, at the least, of inattention. The wardenship, traditionally a patent executed by deputy, had been vacant in effect for a decade.

²⁶Locke, *Further Considerations Concerning Raising the Value of Money*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

²⁷Craig, *Newton at the Mint*; Locke, *Further Considerations Concerning Raising the Value of Money*.

²⁸Locke, *Further Considerations Concerning Raising the Value of Money*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

Charles Montagu, in a private letter of March 1696 that survives in Newton's papers, offered it to Newton at Cambridge and asked him to take it up in April. Newton accepted by return; he was in London by the twenty-second of April and installed at the Mint by the second of May. The wardenship had been converted, in the writing of the letter and the acceptance of it, into an active administrative post at the head of a re-coinage operation the December statute had made obligatory: the philosophical argument had produced a legislative act, the legislative act a personnel decision, and the personnel decision a schedule the presses had never yet run.²⁹

Locke's argument, generalised, implies that Parliament itself could not alter the coin's weight without renegotiating the private contracts denominated in it, a stronger claim than the one Parliament had actually acted on. Later practice did not adopt the stronger form: in 1717 the master would alter the guinea's tariff by administrative order the Treasury countenanced without a legislative act. Craig, whose institutional loyalties incline toward the Mint's administrative discretion, treats the 1717 change as continuous with the Locke position; Desan treats it as a departure whose subsequent success was more accident than principle. The disagreement returns with the 1717 report itself.³⁰

The winter of 1695–96 closed with a currency Parliament had defined and a Mint that would have to produce it. The parliamentary argument was concluded; the physical operation was not begun. The distance between the two was to be filled by an office, the wardenship, that had just changed hands.

Chapter 3. Act Two, 1696–1699: The Great Recoinage as throughput

Newton entered the Tower on the second of May 1696 and found the Mint in a condition its administrative papers had not disguised. The receiving office had taken in, since the December vote, some hundred and twenty thousand pounds sterling of clipped hammered coin against the standing tariff, and the presses had struck against those receipts about seventy thousand pounds in new milled crown and half-crown. The gap between receipts and coining was the physical expression of an operation the office had not been built to run: receiving officers weighed and stamped bags of clipped coin at the counter, but the melting-house and assay office proceeded at their old, unhurried speed on the mixed sterling silver those bags produced, and the rolling mills and presses stood behind the assay's throughput waiting for metal that had not yet been certified fit to strike.³¹

The Tower and its constraints

The Mint occupied a triangle of ground between the Bell Tower and the western wall: the Assay Office along the wall, the melting houses to the south, the rolling mills and cutting

²⁹Craig, *Newton at the Mint*; University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)."

³⁰Craig, *Newton at the Mint*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

³¹University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Craig, *Newton at the Mint*; Li, *The Great Recoinage of 1696 to 1699*.

presses in a covered range at the centre, and eight coining presses ranged against the eastern boundary. The offices of master, warden, and moneyers ran along the north side; the master's counting-house, where the tallies were kept, opened onto the yard through which the horses driving the mills were led each morning. Visitors of the period estimated the whole compound at less than half an acre. Its physical constraint had never mattered under the old, sedate rate of coining, when the presses ran a few days a month and the assay handled what the presses gave it without difficulty; in 1696 the same small compound became the operation's principal problem, and every later administrative decision was, in one way or another, a decision about how to make more of a fixed space.³²

Newton's first written orders, preserved in the master's clerk's papers, are administrative rather than technical: the hours of the moneyers, the accounts of the assayers, the rate of the horses' feed, the security of the receiving office. Technical orders still came from Thomas Neale, whose warrant as master the parliamentary vote had not amended and whose attention to the physical operation of the presses exceeded, on the surviving letters, his more general reputation for absenteeism. Between the two men, and increasingly at Newton's direction after the summer of 1696, the office began working three shifts of moneyers rather than two, kept the rolling mills turning across morning and afternoon by relieving the horses in rotation, and ran the assay office through the night on the previous day's receipts. The presses needed daylight or clear lamp; the assay did not, and so it ran around the clock while the moneyers, cutters, and horse-teams worked their shifts in relay, an arrangement of labor rather than a piece of invention.³³

What the presses produced

Craig's 1946 study and Li's 1963 monograph document the output, though their figures do not quite agree. Craig, from the Mint's own returns, gives the total silver coined between 2 May 1696 and 31 December 1699 as £5,706,004 by weight: £3,921,000 at the Tower, £884,000 at Bristol, £457,000 at Exeter, £395,000 at Norwich, £59,000 at Chester, and the balance at York. Li, reworking the master's accounts against Treasury correspondence, gives £5,527,000, lower at Bristol and Exeter. The three-percent gap is not the kind that unsettles the general figure, but it repays attention: Craig, a former Deputy Master, accepted the master's returns at face; Li, without institutional loyalty to the Mint, cross-checked them against the Treasury's Warrants for Payment and the receiving office's own daybooks, and took the lower figure where the sets disagreed. The likely cause is a branch-mint counting practice, especially at Bristol, that recorded bagged coin twice: once as a receipt from the receiving office, once as a delivery to the Tower. Newton's autumn 1697 correspondence with Bristol suggests he was aware of the ambiguity; whether Craig's higher figure or Li's lower one is right depends on how the ambiguous receipts are accounted, and neither historian is exactly wrong. Li's

³²Craig, *Newton at the Mint*; Royal Mint Museum, "Royal Mint Museum: Catalogue and Research Collection"; University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)."

³³University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Craig, *Newton at the Mint*; Li, *The Great Recoinage of 1696 to 1699*.

figure is the safer round number; Craig's is the upper bound.³⁴

The multiplier is easier to state in ratio than in absolute weight. In the ten years before the recoinage, 1686 through 1695, the Tower struck an average of about £80,000 in silver a year. Taking Li's figure across three years and eight months, the Tower alone averaged close to £1,050,000 a year, thirteen times the pre-recoinage rate. Including the five branch mints, which had not existed as active operations in 1695, the six-centre average approached £1,500,000, about nineteen times the earlier rate. Whether the multiplier is thirteen or nineteen depends on the denominator chosen; the order of magnitude does not, and either figure describes an office that had been converted, for a bounded interval, into something closer to an industrial operation than a coining trade.³⁵

Mills, presses, and the bottleneck

The rolling mills, which reduced ingots of sterling silver to strips for the blanks, were driven by horses at the Tower and by water where it was available at the branches (Chester and York) and by horses elsewhere. Cutting presses, worked by treadle, produced the blanks; coining presses, worked by men swinging counterweighted arms across a screw, impressed crown, half-crown, shilling, and sixpence dies at about thirty pieces a minute per press: eight presses at the Tower, seven at Bristol, four to six at each other branch. The bottleneck was neither cutting nor coining but the assay, which the statute required for every parcel of new coin and which, before Newton's reorganisation of the winter of 1696–97, could not keep pace with the presses. Cupellation to determine fineness required a controlled fire for several hours, and the assay office had two furnaces where it needed six; Newton's letters to the Treasury in October and November 1696 explain the problem in terms an assay chemist would recognise, and by January 1697 the office had its six furnaces.³⁶

The clipped coin to be withdrawn was scattered across the kingdom, and transporting bulk silver to London and new coin back was, by the receiving office's own arithmetic, costlier than running provincial mints for the operation's two-year span. The Treasury established the branch mints by warrant in the summer of 1696, staffing them with moneyers sent from London and dies cut at the Tower; they were distributed nodes of the Tower's operation rather than survivals of any older provincial minting tradition, and they closed within weeks of the July 1699 deadline. Their combined share of the coining, on both Craig's and Li's figures, was about a third of the whole. Projecting that operation across the country on the roads of the 1690s, with no rail and no telegraph to coordinate it, was itself an administrative achievement distinct from the coining figures, and one that depended on moneyers willing to relocate, at short notice, to towns where the Mint had never before struck a coin.³⁷

³⁴Craig, *Newton at the Mint*; Li, *The Great Recoinage of 1696 to 1699*.

³⁵Li, *The Great Recoinage of 1696 to 1699*; Craig, *Newton at the Mint*; Manolopoulou, "The Science of Money: Isaac Newton's Mastering of the Mint."

³⁶University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Craig, *Newton at the Mint*; Manolopoulou, "The Science of Money: Isaac Newton's Mastering of the Mint."

³⁷Craig, *Newton at the Mint*; Li, *The Great Recoinage of 1696 to 1699*.

The receiving side was more disorderly than the coining side. Sheriffs and receivers-general collected clipped coin against the Treasury's proclamations and forwarded it in bags that arrived unweighed, unassayed, and mixed; the receiving offices spent the first weeks of summer 1696 sorting and weighing before coining could begin. Bank of England paper filled part of the gap in London; goldsmiths' bills and shopkeepers' credit filled part of it in the country; and through the summer and autumn of 1696 there was a real monetary contraction whose effects on prices and wages contemporary sources describe in terms a modern reader recognises; Macaulay's narrative account and Li's tabulated one agree on the fact if not the register. The parliamentary settlement had moved the disorder from the counter, where clipped coin had passed at face, to the market, where for some months no coin passed at any face.³⁸

Newton's part in it

Newton's correspondence and the clerk's daybooks preserve three specific habits: attention to detail at the level of the assayer's furnace and the moneyer's press; refusal to let receipts be balanced by fiat (when the clerk proposed in the winter of 1697 that Bristol's returns be accepted without an independent weighing, Newton refused); and willingness to spend to relieve a bottleneck, authorising the four additional assay furnaces of January 1697, at sixty pounds each, without a Treasury order in council. Whether these were the philosophical mind at work in an administrative field, or simply the ordinary attention of a competent administrator who happened to be Newton, the sources do not settle; what they agree on is that the operation ran, and that its running is not adequately described by treating Newton as either a genius transplanted or an ordinary administrator dignified. Manolopoulou's 2022 article traces some of this competence to Newton's earlier experimental work on copper and tin alloys, arguing that his alchemical papers of the 1670s and 1680s gave him a working chemist's vocabulary for the assay problem; the argument bears more directly on the confidence behind the 1717 ratio report.³⁹

None of this ran itself. Behind the tally figures stood several hundred moneyers, cutters, and press-men working paid shifts around the clock, horse-teams relayed to keep the mills turning without a break, and assayers whose furnace-work determined, piece by piece, whether a day's coining met the statute. The master's clerk's daybooks name few of them individually (a moneyer appears as a wage line, a horse as a feed bill), but the throughput figures Craig and Li reconstruct are throughput figures for this labor, not for Newton's administration considered apart from it. Newton set the shift pattern and authorised the furnaces; the men and horses who worked the pattern are the reason the pattern produced coin.⁴⁰

³⁸Li, *The Great Recoinage of 1696 to 1699*; Craig, *Newton at the Mint*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

³⁹University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Craig, *Newton at the Mint*; Manolopoulou, "The Science of Money: Isaac Newton's Mastering of the Mint."

⁴⁰University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Craig, *Newton at the Mint*; Li, *The Great Recoinage of 1696 to 1699*.

The Trial of the Pyx stood as the external audit against which the master's returns were checked: under a statute of Edward III, samples of each week's coining were sealed into a locked chest and opened at intervals by a jury of goldsmiths who assayed them against a plate of standard silver. The trial of 25 March 1697 examined pieces struck through the height of the recoinage; that of July 1699 examined the last of the branch output. Both returned verdicts within tolerance, evidence that the assay office's fineness control held, though the trials assayed fineness, not weight, and so cannot settle Craig's higher output figure against Li's lower one.⁴¹

By the deadline of 4 July 1699, the operation was substantially complete: the clipped hammered coin withdrawn, the new milled coin in circulation, the branch mints closing, the assay office back to its sedate rate, and the master's clerk's daybooks showing a return to a few hundred pounds of silver coined per week. Thomas Neale had died in December 1699, and Newton, on Montagu's warrant of the twenty-fifth of that month, moved from the wardenship to the mastership, an office he held until his death in March 1727. The branch mints closed by summer warrants; the moneyers sent from London returned to the Tower or their private trades; the assay furnaces fell from six to two. The Mint returned to a sedate coining office at a lower scale than it had run even under Neale before the recoinage, and no comparable episode would recur in the eighteenth century. What survived was an office that had, for three years and eight months, produced a currency at thirteen to nineteen times its normal rate, run not by Newton alone but by the moneyers, assayers, horse-teams, and branch staff his administration had coordinated, and a master who had learned, by running it, what an administrative operation could do.⁴²

Chapter 4. Act Three, 1699: Chaloner hanged and the warden's prosecutions

William Chaloner was hanged at Tyburn on the twenty-second of March 1699. The King's Bench roll for the previous term records the indictment: coining and uttering counterfeit guineas at the parish of St Botolph without Aldgate, between May 1697 and October 1698, together with further charges of coining French pistoles and other foreign gold pieces in the same interval. The jury at the sessions of 15 March returned a verdict of guilty on the first indictment and a general verdict on the rest. Chaloner had been in Newgate since the previous March, on evidence the warden's office had gathered over the sixteen months since the summer of 1697.⁴³

An office made active

Before 1696 the wardenship had been treated as a patent whose income the incumbent collected and whose duties his deputy performed; under Neale as master and Sir John Stanley

⁴¹Craig, *Newton at the Mint*; Li, *The Great Recoinage of 1696 to 1699*.

⁴²Craig, *Newton at the Mint*; Li, *The Great Recoinage of 1696 to 1699*; University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)."

⁴³University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; "MINT 15: Warden's Records, Prosecutions and Depositions"; Levenson, *Newton and the Counterfeiter: The Unknown Detective Career of the World's Greatest Scientist*.

as warden, it was, in effect, a title on the Treasury's books, drawing a fee and doing little else. Newton's appointment in April 1696 converted it into an active administrative post, and the recoinage act made the office responsible, in the specific matter of counterfeiting and clipping, for investigating the offences the recoinage was meant to end. From May 1696 through July 1699, Newton took depositions from informers, arranged arrests, corresponded with the Attorney General, and prepared briefs for the King's Bench; the activity survives in the MINT 15 class at Kew and in the transcriptions at Newton and the Mint.⁴⁴

The number of prosecutions is easier to name than to characterise. Craig, drawing on Newton's own summary papers, gives the total between the summer of 1696 and the summer of 1699 as approximately two hundred, of which some fifty ended in capital convictions for counterfeiting or clipping and the remainder in acquittals, discharges, or misdemeanour convictions. Ten of the capital convictions ended at Tyburn or the county assize scaffolds; the rest were reprieved, transported, or pardoned. Levenson's 2009 account, drawn principally from the Chaloner correspondence and the more colourful of the depositions, offers a lower running figure but treats each of the more sensational cases as a chapter in a narrative built for pace rather than for a ledger. The two figures do not exactly disagree: Craig counts the docket as an administrator would, Levenson selects the cases whose depositions carry a story, and both readings stand if the running total is understood in Craig's terms and the narrative colour in Levenson's.⁴⁵

The Chaloner case

The case began in the summer of 1697 with an informer named Thomas Holloway, who told the warden's office that Chaloner had run a coining press at a house in Knightsbridge. Chaloner was already known to the Treasury as a projector: in 1694 and 1695 he had published a series of pamphlets on the Mint's operation and the counterfeiting question, offering himself in each as a man whose advice the Mint ought to purchase. The pamphlets reached Newton's notice in the winter of 1696–97 and produced a growing file of correspondence in which Chaloner offered technical proposals and Newton refused them, a file that suggests, without quite proving, that Newton had formed an opinion of Chaloner as a counterfeiter before Holloway's deposition supplied grounds for an indictment. What followed was a story of counter-informers, false witnesses, an escaped confederate, and depositions taken at Newgate. Chaloner, first indicted in October 1697, was acquitted at the Old Bailey the following March on defence witnesses Newton subsequently proved to have been suborned; the acquittal provoked a more careful preparation of the second indictment, laid at the King's Bench in March 1699, which produced the conviction and the sentence.⁴⁶

⁴⁴"MINT 15: Warden's Records, Prosecutions and Depositions"; University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Craig, *Newton at the Mint*.

⁴⁵Craig, *Newton at the Mint*; Levenson, *Newton and the Counterfeiter: The Unknown Detective Career of the World's Greatest Scientist*.

⁴⁶University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Levenson, *Newton and the Counterfeiter: The Unknown Detective Career of the World's Greatest Scientist*; "MINT 15: Warden's Records, Prosecutions and Depositions."

The surviving depositions do not sustain the more novelistic pieces of the popular literature. They record what informers said they had seen, heard, and done with coined pieces; they do not record Newton conducting the surveillances he is sometimes represented as conducting. His role was that of the taking magistrate, not the investigating officer: he heard depositions, examined witnesses at his lodging or at the Tower, and, where the evidence appeared sufficient, prepared a brief for the Attorney General or the sessions. The active watching was carried out by informers, by watchmen paid from the warden's contingency fund, and by the constables and beadles of the parishes concerned. Newton's own contribution was administrative: he organised the file, cross-checked depositions against one another, and pressed cases a less patient warden would have let go. The distinction is not trivial. The transcriptions sustain the reading of an administrator who had learned the criminal side of the Mint's jurisdiction as he had learned the technical side, working through a small standing establishment of paid watchers and parish officers rather than through any personal detective talent.⁴⁷

Method

Newton's prosecutorial method rested on a small number of practices that later criminal-procedure historians would recognise. The first was corroboration: after the first Chaloner acquittal, he refused to prefer an indictment resting on a single informer, and required at least two independent depositions before pressing a case to trial. The second was pre-trial examination of adversary witnesses: he would examine, before trial, the witnesses the defence proposed to call, and where their evidence appeared false he prepared an information for perjury alongside the principal indictment. The third was pursuit of confederates: rather than treating each coining operation as an isolated offence, he pursued the network of receivers, engravers, and utterers around a principal offender, and frequently secured a coiner's conviction by first securing a confession from a utterer eager to escape a capital charge. None of these practices was new in kind; what was new was the systematic form Newton gave them at the warden's office, a form that passed, at some remove, into the Treasury Solicitor's practice in the following century and, further removed still, into the modern conduct of prosecutions.⁴⁸

The severity of the punishment deserves comment, because it constrains how the depositions should be read. Counterfeiting the coin was a treason under the statute of 25 Edward III, ordinarily commuted at the scaffold to hanging alone for offenders below the rank of gentleman; clipping was a felony carrying the ordinary sentence of hanging. Reprieve, transportation, and pardon ran through Restoration and Williamite criminal practice regardless of the formal sentence, so that only a fraction of persons capitally convicted of coinage offences were in fact hanged. Newton's papers show him active in pressing the Attorney General not only for the indictment but, on occasion, for the sentence itself; he does not appear to have pressed

⁴⁷"MINT 15: Warden's Records, Prosecutions and Depositions"; University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Levenson, *Newton and the Counterfeiter: The Unknown Detective Career of the World's Greatest Scientist*.

⁴⁸University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; "MINT 15: Warden's Records, Prosecutions and Depositions."

for reprieve, and in the Chaloner case he appears to have pressed against it. Levenson, on this point, reads Newton as vindictive; Craig reads him as diligent. What the sources settle is narrower than either reading: Newton ran the warden's office as one that would not defer criminal enforcement to a more lenient Treasury.⁴⁹

What the office had become

Chaloner's conviction, and the smaller sensations of his hearings at Newgate, gave the warden's office a public visibility it had not previously possessed; his name stayed in the newspapers for weeks, where lesser prosecutions passed in a day. The visibility was useful to the office: it signalled to the counterfeiting network in the alleys off Aldgate that the Mint's warden was in earnest, and new prosecutions in the twelve months after the March 1699 execution fell from an average of about sixty a year in 1697 and 1698 to about twenty in the year to March 1700. Whether the fall reflects real deterrence or the network's redistribution beyond the informers' reach, the depositions cannot say. Either way, the warden's office had become, in three years, an institution the counterfeiting network took seriously, and the achievement belonged to the office more than to the Chaloner case alone.⁵⁰

The residue, at the close of 1699, was administrative and doctrinal. Administratively, the Mint had acquired a police function its charter had contemplated only in the vaguest terms; the function survived into the eighteenth century as a routine responsibility of master and warden, and became, by mid-century, one of the standing responsibilities the Mint carried alongside the coining. Doctrinally, the standard Parliament set in December 1695 had been defended not only by the operation of the presses but by the operation of the criminal law: the counterfeiter was prosecuted as an offender against a coin the parliamentary act had made the crown's commitment, and the prosecution was carried by the same institution that struck the coin. The annexation outlasted Newton and remained the Mint's public role well into the eighteenth century, when a separate prosecuting office under the Treasury Solicitor took over the criminal side and left the Mint the standard alone.⁵¹

A comparison with the Bank of England, which faced its own counterfeiting problem in the same interval, is instructive. The Bank had, from its opening in 1694, been embarrassed by forged running cash notes and falsified goldsmiths' bills; its clerks investigated the forgeries much as the warden's office did, calling watchmen and informers, examining suspects on the Bank's own premises, and pressing indictments in the King's Bench. The Bank did not, however, acquire a jurisdictional character that carried enforcement outside its own building; note forgeries were tried under the ordinary criminal law by the Attorney General as ordinary indictments. The Mint's practice, by contrast, treated the coinage offences as offences against the Mint's own charter jurisdiction, and Newton pressed the indictments as

⁴⁹Levenson, *Newton and the Counterfeiter: The Unknown Detective Career of the World's Greatest Scientist*; Craig, *Newton at the Mint*; "MINT 15: Warden's Records, Prosecutions and Depositions."

⁵⁰University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; "MINT 15: Warden's Records, Prosecutions and Depositions"; Craig, *Newton at the Mint*.

⁵¹Craig, *Newton at the Mint*; "MINT 15: Warden's Records, Prosecutions and Depositions"; University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)."

a Mint officer rather than a private complainant. The distinction did not last (by the middle of the eighteenth century the Mint's practice had converged on the Bank's), but through the recoinage years it separated an active jurisdiction from a defensive one, and shaped the subsequent institutional character of both.⁵²

The transcriptions do not decide between an early modern police force and an ordinary prosecuting practice unusually well organised. They show, between 1696 and 1699, a warden's office at the Tower becoming, in operation if not in title, a systematic prosecuting authority for coinage offences, the systematic character being Newton's contribution to an effort carried out, case by case, by informers, paid watchmen, and parish constables whose names the surviving papers keep far less carefully than his. The Chaloner case was not the culmination of a detective career; it was the visible fraction of a warden's ordinary work at the end of a three-year operation whose scale had made the ordinary work extraordinary.⁵³

Chapter 5. Act Four, 1717: The gold-silver ratio and the standard set

The report Newton submitted to the Lords Commissioners of the Treasury on 21 September 1717 ran to eleven manuscript pages in the master's clerk's fair copy, headed "Representation Concerning the Gold and Silver Coins," and closed with a recommendation that the guinea be received at the Exchequer at twenty-one shillings, a reduction of sixpence from the twenty-one shillings and sixpence at which it had passed since 1699. It survives in transcription at Newton and the Mint; the manuscript fair copy is in MINT 19 at Kew. The Treasury received it, laid it before a Committee of the Whole the following month, and issued the corresponding proclamation on 22 December 1717, reducing the guinea's Exchequer tariff and changing nothing else in the standing statute. It has since been read, by scholars whose readings differ substantially, as the founding paper of the gold standard, though the document itself never uses the phrase.⁵⁴

Since about 1710 the guinea had traded on the London bullion market at a rate close to twenty shillings ninepence to twenty-one shillings, while the Exchequer received it at twenty-one shillings sixpence, the Mint's tariff on gold set above the market's. The arbitrage this opened was straightforward: a merchant could bring gold into England, exchange it for silver coin at the generous official rate, and take the silver back out, where it was worth more as bullion abroad than its face value at home. Gold, overvalued at the Exchequer relative to its market ratio against silver, was drawn in and kept in circulation; silver, undervalued at the same tariff, was drawn out; and the domestic silver stock contracted accordingly, transaction by

⁵²University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Craig, *Newton at the Mint*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

⁵³Craig, *Newton at the Mint*; Levenson, *Newton and the Counterfeiter: The Unknown Detective Career of the World's Greatest Scientist*; University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)."

⁵⁴University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Manolopoulou, "The Science of Money: Isaac Newton's Mastering of the Mint"; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

transaction, faster than the Mint's own sedate coining could replace it. Newton documented the market rate against the Mint tariff for 1710 through 1717 in tables accompanying the September representation, and concluded that the guinea's tariff should be cut by sixpence or a whole shilling, or that the silver parity should be raised, or some combination undertaken. He recommended the sixpence reduction, as least disturbing to existing contracts, and the Treasury accepted it.⁵⁵

Three readings of one report

What the report did, in its own terms, is plainer than what scholars have made of it doing. Craig treats it as an administrative response to a market situation Newton had watched since the beginning of the century: the guinea, proclaimed at twenty-two shillings after the recoinage and reduced to twenty-one shillings sixpence in 1699, was still tarified above its market ratio to silver in 1717, and Newton's report adjusted the tariff toward the market in the Mint's ordinary administrative terms. The master had the technical authority to recommend such adjustments, the Treasury the political authority to accept or refuse them, and the 1696 parliamentary standard was neither altered nor threatened by an adjustment of the ratio at which gold and silver would be received at the counter. Desan treats the report as constitutively different: the market situation it addressed had itself been produced by the 1696 standard-setting act, so the 1717 adjustment was not a technical correction but a further public choice about the coin's character, a piece of legislation without a legislature, made by the master with the Treasury's concurrence and without the parliamentary reconsideration Locke had treated as constitutive of any change of standard. On this reading Newton is not innocent of the standard-setting later commentators attribute to him; he is its author, though not on the terms that attribution usually implies. Manolopoulou reads the report as administrative in intent and consequential in effect, made possible by the assay reforms of the 1690s and 1700s, which had by 1717 sharpened the Mint's ability to fix the gold-silver ratio at the counter with a precision an earlier assay office could not have supported. The three readings share the facts and differ on what the report was for; none is disproved by the others, and the disagreement is the material of the doctrinal history the report has become.⁵⁶

The 1717 report was not Newton's first intervention. He submitted a shorter memorandum on the ratio in 1702 and returned to it in 1711; the Treasury acted only on the third recommendation. Newton's correspondence treated each as administrative advice whose reception the Treasury would decide. That sequence supports Craig's account of recurring tariff administration while leaving Desan's constitutional question intact.⁵⁷

⁵⁵University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Li, *The Great Recoinage of 1696 to 1699*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

⁵⁶Craig, *Newton at the Mint*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Manolopoulou, "The Science of Money: Isaac Newton's Mastering of the Mint."

⁵⁷University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Craig, *Newton at the Mint*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

What followed

Between 1717 and 1774 the domestic silver stock kept contracting as merchants shipped silver abroad against gold received at the Mint's tariff. Under George I and George II the Mint struck almost no silver; the coin in circulation was the recoinage silver of 1697–99, worn down by ordinary use and never meaningfully replenished. By the middle of the eighteenth century the effective medium of English payments was the gold guinea and, for small change, a shilling and sixpence of increasingly dubious weight. The 1774 silver recoinage act, under George III, reset the currency by a smaller re-strike than 1696 had required, but did not restore the silver stock to its 1699 level. The Coinage Act of 1816 (associated with Lord Liverpool's monetary recommendations and the 1816–17 recoinage that followed it) formalised gold as the principal standard and reduced silver to a token coinage, making statutory what Newton's tariff had made administrative a century before. On this sequence, the 1717 tariff reads as the operational origin of the gold standard even though it never named itself as such, and even though the century that separates the report from the statute is exactly the space in which the three readings above compete for the credit, or the blame.⁵⁸

The proclamation of 22 December 1717 settles what the Treasury actually did, as distinct from what Newton had recommended. Issued in George I's name, it reduced the guinea's Exchequer tariff to twenty-one shillings, the half-guinea and quarter-guinea in proportion, and made no other change; an appended schedule set the rates for foreign gold pieces (the moidore, the pistole, the ducat) at levels consistent with the new guinea tariff. It left the 1696 silver tariff, five shillings twopence per ounce troy, untouched, and it made no reference to a standard, a metal, or a doctrine. In this respect it fits Craig's administrative reading plainly: a specific tariff altered, in the office where such alterations had always been made, with the standing statute of 1696 left in place. Its larger consequence belongs entirely to the market response that followed over the next century.⁵⁹

One comparison sharpens the doctrinal question. The 1695 silver standard had been set by three weeks of Commons deliberation, evidence taken from the Treasury and private commentators, and a bill receiving royal assent before Christmas. The 1717 tariff adjustment was made by proclamation of the Crown-in-Council, without parliamentary debate or a bill, in the same administrative channel through which the Mint had always set its buying and selling tariffs for bullion. On Locke's argument these were acts of different constitutional character, the first a legislative commitment and the second a mere adjustment beneath it; on the Treasury's practice, both were exercises of the crown's authority over the coinage, and the eighteenth-century masters after Newton took the Treasury's view without recorded dissent. Whether that is what Locke would have said in 1717, or what Newton believed he was doing when he wrote a report he never called a standard-setting document, the surviving

⁵⁸Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Manolopoulou, "The Science of Money: Isaac Newton's Mastering of the Mint"; Li, *The Great Recoinage of 1696 to 1699*.

⁵⁹University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; Craig, *Newton at the Mint*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

papers leave open.⁶⁰

None of this was visible to the men who signed the proclamation. The Lords Commissioners who accepted Newton's recommendation in December 1717 were adjusting a single tariff among the many the Treasury set and reset in the ordinary course of its business: the price of foreign coin at the Exchequer, the discount on worn silver, the terms on which the Mint would buy bullion in a given quarter. What made this adjustment different from the others was not its form but its durability: unlike a discount schedule, a tariff on the coin most commonly used in large payments could not easily be reversed once merchants had built their arbitrage around it, and by the time anyone thought to reverse it, reversing it would itself have been a disruption of the settled expectations Locke's argument had said the crown could not disturb without a legislative act. The mechanism that fixed the gold standard in place, in other words, was not a decision anyone made in 1717; it was the ordinary reluctance of an administrative office to unsettle a tariff that had, by inertia, become load-bearing.⁶¹

Epilogue. 1727 and after: what did and did not persist

Isaac Newton died at Kensington on 20 March 1727, at eighty-four, having held the mastership for twenty-seven years. His warrants were signed at Kensington by hand until November 1726 and by attested proxy in the four months to his death, but the office did not falter: John Conduitt, his deputy since 1721, ran it in the ordinary course and succeeded him by the King's warrant of 2 May 1727. The transition was smooth, uncontested, and administratively continuous. What changed is not visible in a personnel record.⁶²

Conduitt's mastership, from May 1727 to his own death in May 1737, has been read in the historiography as a caretaker administration, and the master's papers of the interval support the reading: a return to the sedate pre-recoinage coining rate, a further contraction of the silver stock, and a growing reliance on Bank of England notes and goldsmiths' credit for large payments. The Trials of the Pyx of 1728 through 1736 returned verdicts within tolerance, and nothing coined in the interval deviated from the 1696 standard. Three specific measures of the office's reduced activity survive in the Mint's own papers. The assay furnaces Newton had raised from two to six in the winter of 1697 fell to three in 1701, as the recoinage wound down, and to two in 1728, the year after his death; the assay office returned to the slower cupellation practice that had preceded his reforms, though the reduced assay was adequate to the reduced coining. The warden's office ceased to keep an active prosecution docket: the MINT 15 papers for 1727 through 1760 are markedly thinner than those for 1696 through 1699, and informer reports were forwarded to the Treasury Solicitor rather than acted on at the Mint, which returned, in effect, to the patent character it had held before Newton. And no master after 1717 recommended a further tariff adjustment; the standing ratio was treated

⁶⁰Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Locke, *Further Considerations Concerning Raising the Value of Money*; Craig, *Newton at the Mint*.

⁶¹Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Craig, *Newton at the Mint*.

⁶²Craig, *Newton at the Mint*; University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)."

as fixed until the silver recoinage act of 1774.⁶³

The absence of further tariff adjustments has been read variously: by Craig as evidence the 1717 tariff was in fact the right one, by Desan as evidence the master's office had lost the standing to recommend further changes, by Manolopoulou as evidence that post-Newton assay precision no longer supported a confident recommendation. The readings are not mutually exclusive, and none is required to explain what is otherwise a plain fact: what Newton's mastership had integrated (the administrative, technical, and criminal jurisdictions of the office, coordinated personally by one master), his successors did not repeat, because the Mint of the eighteenth century did not need the integration to keep the standard.⁶⁴

Sir John Barnard, member for the City of London, raised the question directly in 1745 and 1749, proposing in the associated Commons debates on the funded debt that the silver currency be re-struck either at the 1696 standard or at a reduced one consistent with the market ratio the 1717 tariff had produced. The master of the time, Andrew Fountaine, gave no evidence to the committee and proposed no position on the surviving papers; the Treasury deferred the question, and no further silver recoinage occurred until 1774. Where Newton would have prepared a technical brief and pressed a recommendation, Fountaine did not. The master's chair had ceased to be a source of policy proposals for the coinage question.⁶⁵

At the level of the standard, the position by mid-century was this: the 1696 silver standard remained the law, but was in effect nominal, because the silver currency it defined had substantially emigrated; the 1717 gold tariff remained administrative, but was in effect operative, because the guinea and half-guinea were the medium of large payments. The gap between the legal standard and the operative one, opened by the 1717 tariff, was not closed by any master before the 1774 recoinage act, and was fully reconciled only by the Coinage Act of 1816. The Mint after Newton held that gap open by administrative inaction rather than closing it by reform, a course no eighteenth-century master left any account of having weighed.⁶⁶

The master's chair passed, at Newton's death, to men with narrower policy autonomy, smaller willingness to run the office actively, and fewer technical resources. The Mint under Newton is intelligible as a specific episode at the intersection of administrative, technical, and criminal jurisdictions; the Mint after Newton is intelligible as a technical office of the standard, its several jurisdictions disaggregated and its ordinary operation competent but sedate. What Newton's mastership had integrated, his successors kept in the several offices where it had found them.

⁶³Craig, *Newton at the Mint*; Li, *The Great Recoinage of 1696 to 1699*; Manolopoulou, "The Science of Money: Isaac Newton's Mastering of the Mint"; "MINT 15: Warden's Records, Prosecutions and Depositions"; University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)."

⁶⁴Craig, *Newton at the Mint*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Manolopoulou, "The Science of Money: Isaac Newton's Mastering of the Mint."

⁶⁵Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Craig, *Newton at the Mint*.

⁶⁶Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Craig, *Newton at the Mint*; Manolopoulou, "The Science of Money: Isaac Newton's Mastering of the Mint."

Coda. The metal answer to the paper promise

The two institutions faced the same 1690s crisis with different instruments, and both instruments survived. The Bank of England, chartered in July 1694 as a company of subscribers to a government loan secured on a new excise, met the fiscal side of the crisis by monetising a public debt and issuing paper against it. The Mint, restored to operation in the spring of 1696 under Newton's wardenship, met the physical side by re-striking the nation's clipped silver at the old standard. The two instruments were unequal in their first years: the Bank's notes circulated principally in London and among mercantile houses, while the Mint's coin circulated across the kingdom, from the Cornish tin markets to the port of Newcastle. The Bank's paper answered a shortage of large denominations for wholesale settlement; the Mint's coin answered a shortage of any denomination for retail exchange. Neither answered the other's shortage, and both were required for the crisis to be met and kept after it had passed.⁶⁷

The reciprocal accounting of the two institutions makes the pairing easiest to see. The Bank accepted clipped hammered coin at its counter, weighed it, and issued running cash notes against its metal weight; its clerks in the summer of 1696 spent as much time weighing as writing. The Mint, through the Treasury's receivers-general, took in both clipped coin and Bank paper as payment on the excises funding the recoinage; the master's clerk's daybooks record Bank paper as an ordinary form of settlement from the summer of 1696 onward. The two were not competitors but complementary instruments of a single monetary system: the Bank's paper bridged the gap while the coin had been withdrawn and not yet re-struck; the Mint's coin was, in the end, the material against which the Bank's paper was convertible.⁶⁸

The eighteenth century carried the two institutions further apart. The Bank became progressively more active as a monetary institution: developing note issue, the clearing of goldsmiths' bills, the lender-of-last-resort function Bagehot would later name, and the exchange dealing that made London the dominant financial centre by the mid-nineteenth century. The Mint became progressively less active as an administrative one: it maintained the standard, struck the coin, and answered to the Trials of the Pyx, but did not resume the character of an active monetary authority until the Coinage Act of 1816 and the reorganisation that followed it. By 1800 the two institutions were unequal in the way the century had made them.⁶⁹

Two readings of that divergence are current, and both are compatible with the evidence. On the first, Craig's, the divergence is a natural specialisation of function: the Bank as monetary institution, the Mint as technical office of the standard, each finding its level in a settled division of monetary labour. On the second, Desan's, the divergence works out a specific choice made by the 1696 standard-setting act and the 1717 tariff adjustment together: the choice to define the coin as a public commitment alterable only by legislation, alongside the practice of letting the Treasury and the Mint adjust the tariffs at which coin was received without further legislative sanction. On the first reading the Mint's reduced role is an office

⁶⁷Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Craig, *Newton at the Mint*.

⁶⁸Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Craig, *Newton at the Mint*; Li, *The Great Recoinage of 1696 to 1699*.

⁶⁹Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Craig, *Newton at the Mint*.

finding its level; on the second it is the consequence of an unresolved tension in the underlying settlement. Both stand.⁷⁰

Neither institution could have absorbed the other's task. The Bank's subscribers had put up capital against a government annuity; they had no presses, no assayers, no moneyers, and no statutory jurisdiction over the physical coin. The Mint had presses, assayers, and moneyers, and after 1696 a warden's jurisdiction over the coin's imitators, but no capital to lend and no mechanism for issuing a promise to pay against future revenue. The 1690s crisis needed both kinds of instrument at once, a government that could borrow against the future and a currency that could be trusted in the present, and it got them from two institutions chartered and re-founded within two years of each other, staffed by men who moved between them (Montagu had built the Bank's charter before he sent Newton to the Mint) but who ran, from 1696 onward, genuinely separate operations.⁷¹

The 1690s crisis had two answers, and a historiography that remembers only the Bank tells half the story. The Bank's answer would not have sufficed alone; the coin had to be re-struck and the standard preserved if the paper was to be a redeemable instrument at all. The Mint's answer (less visible in later financial histories, less flattering to the ordinary narrative of financial modernisation) was the physical foundation on which the Bank's paper stood. Newton's administrative accomplishment at the Mint through the recoinage years is not a picturesque episode in the biography of the *Principia*'s author; it is one of two institutional accomplishments without which the crisis of the 1690s would not have been met, alongside the moneyers, assayers, informers, and provincial mint staff who carried it out under his direction. The other accomplishment, the Bank's issue of paper against a monetised public debt, is by common consent one of the founding events of modern finance. The Mint's recoinage deserves to stand beside it, and so, in any account of the Bank's own founding, does the physical currency its paper depended on.⁷²

The whole of it comes to this: a re-strike at the old standard; an administrative operation at a scale the office had never before attempted; a warden's jurisdiction that annexed the criminal law to the defence of the coinage; a tariff adjustment whose subsequent history made an administrative note the founding document of a doctrinal standard; and a passage after the master's death that closed the integration and left the several offices in the sedate operation of their several jurisdictions. Two answers, both kept.⁷³

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⁷⁰Craig, *Newton at the Mint*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

⁷¹Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*; Craig, *Newton at the Mint*.

⁷²Craig, *Newton at the Mint*; Li, *The Great Recoinage of 1696 to 1699*; Desan, *Making Money: Coin, Currency, and the Coming of Capitalism*.

⁷³University of Oxford, "Newton and the Mint (Transcriptions of Newton's Mint Memoranda, Correspondence, and Warden's Depositions)"; "MINT 19: Newton Papers"; "MINT 15: Warden's Records, Prosecutions and Depositions"; Royal Mint Museum, "Royal Mint Museum: Catalogue and Research Collection"; Craig, *The Mint: A History of the London Mint from A.D. 287 to 1948*.

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