

# Counting Money: The US Dollar and American Nationhood, 1781–1820

ROBERT GARSON

The success of the Founding Fathers in building a nation has for a long time attracted a sense of marvel. That admiration is well deserved. Political leaders in post-Revolutionary America understood that hard-won liberty could only flourish if there was a popular sense of common enterprise. They needed to create a cultural settlement that gave the idea of national civilization clear meaning. The new state would have to contrast sufficiently to the league of states that had combined to overthrow colonial rule, while still protecting local interests and sensitivities. It was an era that lent itself to imaginative statecraft and the Founding Fathers supplied it through their crafting of a national government and a national society.<sup>1</sup> They appreciated that proper constitutional arrangements would not in themselves suffice to bind the common enterprise. The young republic needed to generate its own cultural and economic mechanisms that would serve to consolidate affinity to the nation. Recent studies on the formation of nationhood in the United States have identified some of these mechanisms in the shape of everyday experience in the forging of an identity that transcended the local community. For example, David Waldstreicher and Len Travers have pointed to the role of festivity and ritual in creation of a national consciousness. They have shown that celebration in the early republic served to reinforce the national implications of the American Revolution.

Robert Garson is Reader and Director of the David Bruce Centre for American Studies, Keele University, Keele, Staffs. ST5 5BG.

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<sup>1</sup> Stanley Elkins and Eric McKittrick, *The Age of Federalism* (New York and Oxford, 1993), 25–78; Robert H. Wiebe, *The Opening of American Society: From the Adoption of the Constitution to the Eve of Disunion* (New York, 1985), 36–37.

Similarly, Wilbur Zelinsky and Lester Olson have directed attention to the importance of artefact and repetitive images in the promotion of a national political orientation.<sup>2</sup> This article will build on these studies and show that the architects of the financial structure of the nation also appreciated that material things and common encounters could serve to enhance or even alter national identity.

There was one device that statesmen of the young republic employed to enable Americans to reorientate their concept of national authority. That was money. Currency, in the form of coin, banknotes, bills of credit and promissory notes was widely handled in America's commercial culture. If money performed its proper function by encouraging trade and investment, it would endear the population to the authority that was responsible for its issue. Money was an artefact as well as a trading device. The pictorial images and the promises of negotiability conveyed on coins, banknotes and other financial instruments were repetitively encountered on a daily basis. They were visual reminders of the connection between finance, stability and national authority. In both function and design money promotes specific political preferences. If the monetary system worked properly it would also convey political messages appropriate to fledgling nationhood.

This article will argue that the adoption of the dollar as a distinctive denomination was not simply a matter of financial rationalization. It performed the important task of suggesting the solidity of national authority. Nomenclature made a difference – as both proponents and opponents of the “euro” insist is the case in contemporary Europe. The addition of the decimal basis for counting money also separated the new republic from other systems of financial calculation. Decimalization required an element of mathematical reorientation by everybody who handled money and financial accounts. As a result, the issue of the new federal dollar was reinforced by a campaign to enlarge the incidence of numeracy and in the process stimulated debate on the relationship between modes of counting and national identity.

<sup>2</sup> Paul Nagel, *One Nation Indivisible: The Union in American Thought, 1776–1861* (New York, 1964); Gordon Wood, *The Radicalism of the American Revolution* (New York, 1991); David Freeman Hawke, *Everyday Life in Early America* (New York, 1998); David Waldstreicher, *In the Midst of Perpetual Fetes: The Making of American Nationalism, 1776–1820* (Chapel Hill, 1997); Len Travers, *Celebrating the Fourth: Independence Day and the Rites of Nationalism in the Early Republic* (Amherst, 1997); Wilbur Zelinsky, *Nation into State: The Shifting Symbolic Foundations of American Nationalism* (Chapel Hill and London, 1988); Lester C. Olson, *Emblems of American Community in the Revolutionary Era: A Study in Rhetorical Iconology* (Washington D.C. and London, 1991).

Money was, and is, not just an instrument to facilitate exchange. It calibrates value. Its use requires individuals to engage in an intellectual exercise. At the simplest level consumers are always being asked to make choices between available goods. The clearest and most consistent criterion for informed choice is price.<sup>3</sup> However, in late eighteenth-century America simple price comparisons were difficult because there was a vast array of currencies. Encounters with money often involved elaborate mathematical calculation. If merchants or farmers could not work out income and expenditure, credits and debits, then their businesses would struggle. Where they were involved in trade with other nations or states, an understanding of exchange rates and conversion techniques was a vital mercantile tool. Thus if the new nation's monetary system were to foster a preference for national authority, it had to be efficient, ordered and understood.

When the American Revolution broke out, the union of states was confronted with a bewildering array of currencies, based on colonial practice. Each colony had issued its own paper money in the form of bills of credit. While these were denominated in pounds, shillings and pence there was no parity of value. A pound in one colony was not worth the same as a pound in another and accordingly exchanged with sterling at different rates. International trade was conducted through bills of exchange denominated in British sterling. Intercolonial trade also used British money as the unit of account, but settlements were usually made in colonial currency. Because American pounds varied in value from colony to colony, exchange rates had to be published regularly.

Specie was also hard to obtain. English coins in particular were rare as a result of the British prohibition on their export. Nevertheless, gold and silver coins still circulated. They included the French louis d'or, or guinea, the Austrian thaler, the Dutch rijksdaalder and leeuwendaalder (lion dollar) and, the most common coin, the Spanish piastra or real, minted in units or pieces of eight that came to be called the Spanish dollar. In the Revolutionary period Spanish dollars comprised about half the coin in circulation. The situation became even more complicated when the Continental Congress issued its own paper currency, denominated in dollars. Thus, by the end of hostilities, Americans encountered

<sup>3</sup> See James Buchan, *Frozen Desire: An Inquiry into the Meaning of Money* (London, 1997); Georg Simmel, *The Philosophy of Money* (translated edition, London, 1990); David Boyle, *Funny Money: In Search of Alternative Cash* (London, 1999); Fritz Breithaupt, "Money as a Medium of Communication and Money as Individuation," *New Orleans Review*, 24 (Summer 1998), 23–29.

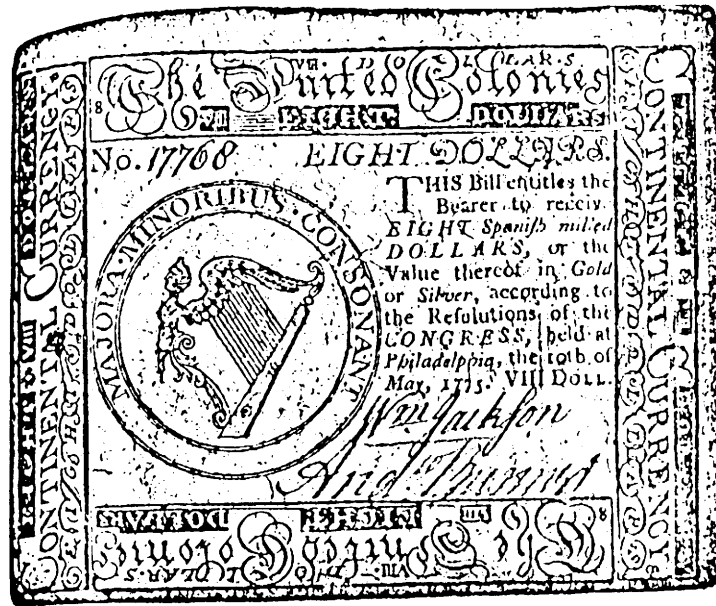


Figure 1.

Continental dollars, thirteen different state monies, sterling, and specie coins of diverse origins, including from Spain, Portugal, France, Austria and Holland.<sup>4</sup>

These problems were compounded by the obfuscation arising from the confusion of different monies. The leaders of the new nation recognized that the provenance of money could play an important role not only in clarifying the nation's accounts, but also in forging new ideas about sovereignty and, ultimately, national identity. Nationalists particularly understood that a common currency that was universally negotiable would not only put the new nation on a sound financial footing, but also would serve as a political magnet for the states as they moved uncertainly to common and modern nationhood.

The first nationwide currency preceded the formation of the Union. Notes were issued by the Continental Congress and were primarily intended to finance the war against Britain. They were denominated in

<sup>4</sup> See Edwin J. Perkins, *American Finance and Financial Services, 1700–1815* (Columbus, Ohio, 1994); John J. McCusker, *Money and Exchange in Europe and America, 1600–1775: A Handbook* (Chapel Hill, 1978); Curtis P. Nettels, *The Money Supply of the American Colonies Before 1720* (Madison, 1934); Raphael E. Solomon, "Foreign Specie Coins in the American Colonies," in Eric P. Newman and Richard G. Doty, eds., *Studies on Money in Early America* (New York, 1976), 25–42.

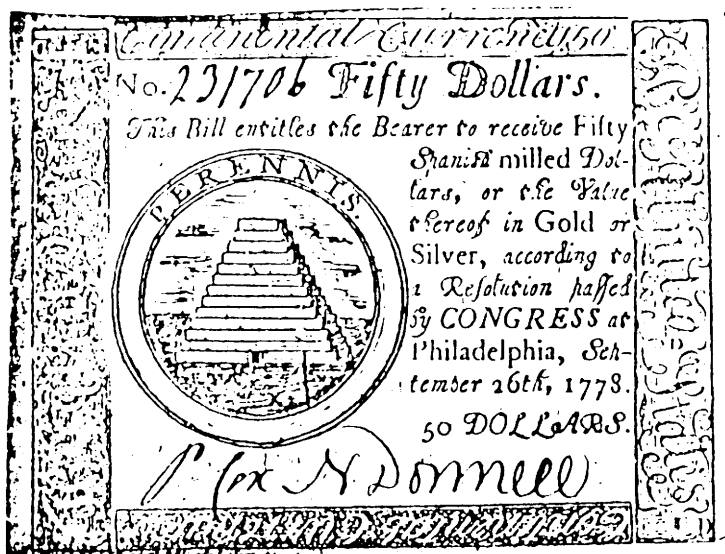


Figure 2.

dollars so as to be convertible, at least in theory, into Spanish silver dollars. The continental dollars served not merely to meet the expenses of the war, but also to generate adherence to the continental enterprise. Their designs consistently conveyed the theme of thirteen states, working in harmony. Depictions included musical instruments with 13 strings, the sun with 13 rays, and a pyramid with 13 steps. A candelabrum of thirteen candles on a New York bill carried the motto, “UNO EODEMQUE IGNI” (one and the same fire). While continual emissions resulted in massive inflation, rendering the bills almost worthless, they had the advantage of passing at a single rate of exchange against the Spanish dollar throughout the land at any one moment. State emissions, on the other hand, were exposed to varying rates of exchange and were usually not received beyond the territorial limits of each state. Thus, despite rampant devaluation, Americans were content to use the national currency. In the words of an early nineteenth-century historian, “Bad as the Continental Bills had become in the latter period of their existence, they always bore the stamp of nationality ... and during that long period worked as a most powerful state-engine ... . While that artificial currency lasted, it was a happy illusion, which worked the miracle of reality”<sup>5</sup> (see Figures 1, 2, and 3).

<sup>5</sup> Samuel Breck, *Historical Sketch of Continental Paper Money* (Philadelphia, 1843), 27, 39.



Figure 3.

The states, on the other hand, continued to issue their own bills of credit and these were generally still denominated in pounds, shillings and pence. In theory these were convertible into Spanish milled dollars, and sometimes notes bore the conversion ratio on the reverse side. For example, a South Carolina note of 23 December 1776, specified the exchange rate £6 10s 0d for four milled dollars or its equivalent in gold or silver (see Figure 4).

The different denominations of silver coins, continental notes and state bills of credit made for confusing book-keeping and commerce. The men who oversaw the nation's finances concurred unanimously that the system needed an overhaul. They agreed that a simplified and unitary currency not only would facilitate financial transactions, but also would provide the opportunity to reassess monetary convention and in the process enable a reorientation in thinking about national authority. It soon became clear that changes in monetary notation would require a reconsideration of the system of counting and the training and intellectual processes associated with numbers. Continental bills were issued in dollars and in fractions of dollars. The states continued to reckon in their respective pounds, shillings and pence. Rates were fixed against silver and varied from state to state. Merchants, therefore, had to have access to conversion tables or



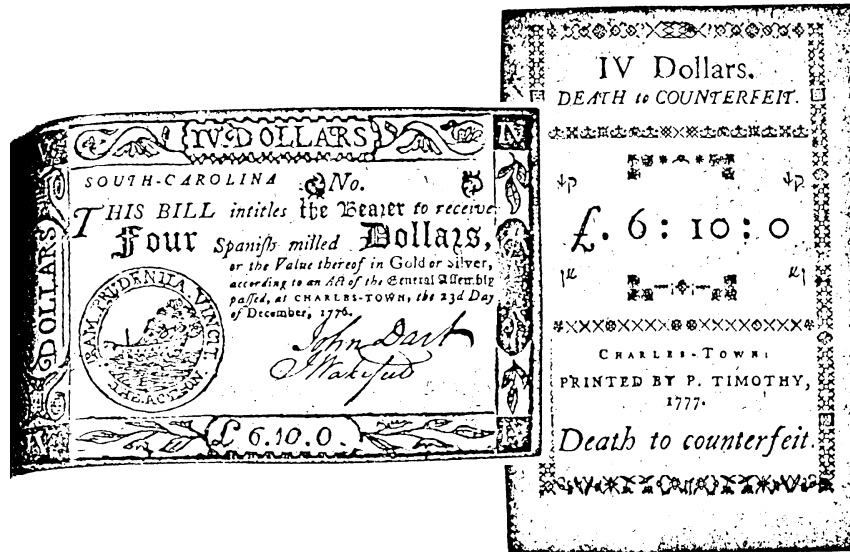


Figure 4.

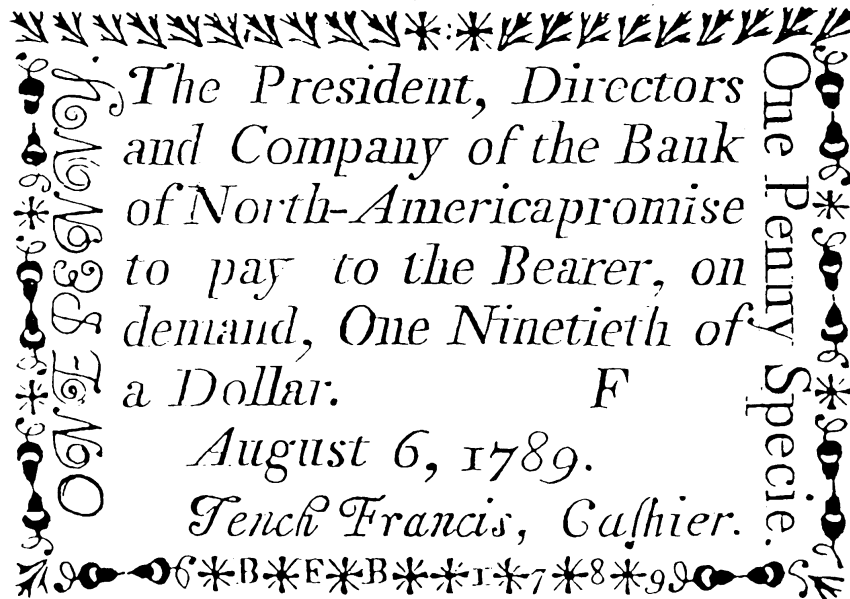


Figure 5.

master techniques for converting one currency into another. A widely used handbook, *The Schoolmaster's Assistant*, by Nathan Daboll, gives an idea of the complicated mathematical labyrinths involved. He offered the following formula for converting the identical currency of South Carolina and Georgia into the money of New Jersey, Pennsylvania, Delaware and Maryland: “multiply the given sum by 45, and divide the product by 28.” To add to the confusion, for conversion to New York and North Carolina currency he suggested: “Multiply the given sum by 12, and divide the product by 7.”<sup>6</sup>

Because each state established exchange rates against the Spanish silver dollar, the mathematics was further complicated when the dollar was divided into fractions. In Pennsylvania one milled dollar was worth 7s 6d or 90d. So subdivisions were calculated in ninetieths – a dollar and a half was one and forty-five ninetieths. In Massachusetts the dollar was worth only worth 6s (or 72d) and so the smallest subdivision of the dollar was one seventy second. In New York the bank issued sterling bills at 8s to the dollar, making the fractional unit ninety sixths<sup>7</sup> (see Figure 5).

The difficulty of ascertaining equivalents in dollars between the various state currencies prompted Robert Morris, Superintendent of Finance under the Articles of Confederation, and his deputy, Gouverneur Morris, to consider the new nation's monetary denominations. Gouverneur Morris hoped Congress would standardize currency so that “the same names of money will mean the same things in the several parts of the United States.”<sup>8</sup> The bewildering array of money had to be simplified to make life easier for both merchants and the mass of ordinary Americans. He insisted that any new currency had to be distinctly American, without infusion from the Old World. The adoption of a new national currency, backed by coinage, would drive out European issues and ease cumbersome mathematical calculations. Reform would also do away with the complicated fractions, arising from the variations in the number of pence

<sup>6</sup> Nathan Daboll, *Daboll's Schoolmaster's Assistant: Improved and Enlarged, Being a Plain Practical System of Arithmetic Adapted to the United States* (New London, Conn., 1818). The first edition of this popular work appeared in 1800. The formulae for calculating exchange rates did not change.

<sup>7</sup> Arthur Nussbaum, *A History of the Dollar* (New York, 1957), 45; Thomas M. Doerflinger, *A Vigorous Spirit of Enterprise: Merchants and Economic Development in Revolutionary Philadelphia* (Chapel Hill, 1986), 268–69. The small denominations were still called pence and not cents as they did not represent decimal fractions.

<sup>8</sup> Quoted in C. D. Hellman, “Jefferson's Efforts towards Decimalization of United States Weights and Measures,” *Isis*, 16 (1931), 267; Max M. Mintz, *Gouverneur Morris and the American Revolution* (Norman, Okla., 1970), 133–45.



to the dollar.<sup>9</sup> However, he was worried that if America completely abandoned its connections to old values and were to start from scratch, confusion would reign as ordinary Americans would be bedazzled by strange and unfamiliar units. Instead he proposed to create two different types of money, a money of account and a minted money of coinage. The first would be used in book-keeping, the latter in everyday cash transactions.

Robert Morris accepted his assistant's plan and presented it to the Continental Congress on 15 January 1782, calling for the establishment of a mint to realize these objectives. Both Morris and his assistant believed that the new monetary units would have to accommodate the varying exchange rates against the pound in the states. The monetary unit they came up with was the fourteen hundredth and fortieth part of a Spanish dollar. One thousand four hundred and forty was divisible by all denominators of existing state monetary units, except for that of South Carolina. There would be 1,440 units in one dollar. The Morrises favoured this scheme as it reconciled federal money with state money and would require little change in book-keeping, as the fractions converted into English pence, and made the maths easier as coins would be minted in decimal units of these fractions.<sup>10</sup> Thus, while their nationalist convictions drove them to espouse strong central authority, they were sensitive to federalist fears of upsetting the apple-cart too much.

The Morris' plan was challenged by a rival blueprint, but not because of any attachments to local jurisdiction over monetary issue. Thomas Jefferson proposed a root-and-branch alternative that would abandon all vestiges of the old currency and create a new financial beginning. Jefferson was convinced that a fresh start with a uniform system would be conducive to a republican culture. He had taken a particular interest in monetary denomination, not simply for its impact on the economy and general political perceptions, but because money was a central feature of a larger framework of measurement and accuracy that was so central to his cosmology. According to Jefferson, science and government were inextricably related. He embraced the Enlightenment's interest in measurement. He shared the view of his age that mathematics was the basis for understanding the world order and that a mastery of nature's calculus would enable man to effect improvements over his environment. Measurement to Jefferson was not just a matter of accuracy; it was also a matter of aesthetics. A perfect universe was capable of perfect

<sup>9</sup> Gouverneur Morris to William Hemsley, 30 Apr. 1783, *The Papers of Robert Morris, 1781-84* (8 vols., Pittsburgh, 1975-95), 7, 761-64.

<sup>10</sup> *Ibid.*, 4, 25-27.

measurement. Jefferson tried to use Newtonian physics to establish fixed correlations between different units of measurement and intended that every unit employed in America would be derived from the motion of the universe.<sup>11</sup> Those units would include coinage. Jefferson's position on the measurement of money was consistent with his general preoccupation with numbers and his desire to disengage America from the standards of Europe by introducing an exclusively American system of calibration.

Jefferson believed that Robert and Gouverneur Morris's plans for a currency were unnecessarily laboured and complicated. His counter-proposals reflected his preoccupation with symmetry and its underpinning in mathematics. While Robert Morris focused his attention on reconciling coins of different value, Jefferson elevated the role of money arithmetic. He believed that it made no sense to separate coins from the money unit of account. After all, the American Revolution had involved a reassessment of a wide range of political and ideological agendas. Jefferson always had one eye to the future and realized forthcoming generations could not be creative unless the present generation was prepared to rethink its ways.<sup>12</sup> It seemed logical to make a fresh start in arithmetical systems too. He started with money. Once Americans realized that the transition to a new way of counting money was not difficult, they could move to the next step and think about the calibration of weights, measures and even time. Jefferson wrote down his thoughts in the spring of 1784 and sent them to the Continental Congress from Paris. He began with two premises. The first was that America should have its own identifiable currency, without lingering links to pounds sterling. Second, it should be mathematically simple. A decimal basis would give it such simplicity. Decimal reckoning would not only reconcile coinage to simple number theory, but also would make the exercise of accounting apparent to the plainest inhabitant. He concluded:

Every one knows the facility of Decimal Arithmetic. Every one remembers, that, when learning money arithmetic, he used to be puzzled with adding the farthings, taking out the fours and carrying them on; adding the pence taking out the twelves and carrying them on. But when he came to the pounds, where he had only tens to

<sup>11</sup> Gary Wills, *Inventing America: Jefferson's Declaration of Independence* (New York, 1978), 106, 119–38; Morris Kline, *Mathematics in Western Culture* (London, 1954), 238–54; Brooke Hindle, *David Rittenhouse* (Princeton, 1964), 82–92.

<sup>12</sup> On Jeffersonian ideas in general see Joyce O. Appleby, *Capitalism and a New Social Order: The Republican Vision of the 1790s* (New York, 1984); Joyce P. Appleby, *Liberalism and Republicanism in the Historical Imagination* (Cambridge, Mass., 1992); Drew R. McCoy, *The Elusive Republic: Political Economy in Jeffersonian America* (Chapel Hill, 1980); Lance Banning, *The Jeffersonian Persuasion: Evolution of a Party Ideology* (Ithaca, 1978).

carry forward, it was easy and free from error. The bulk of mankind are school boys thro' life. These little perplexities are always great to them. And even Mathematical heads feel the relief of an easier substituted for a more difficult process.<sup>13</sup>

Jefferson's argument on currency was consistent with his belief that a clean sweep was often preferable to tampering. Robert Morris, in his view, was too preoccupied with reconciliation to the old system. Merchants would manage the switch to the dollar easily. At present, wrote Jefferson, they had to deal with two units of currency, the pounds of the respective states, which were still used in book-keeping, and dollars. If they could manage dual accounting, they could handle a single conversion to a single decimal currency. Jefferson appreciated that in the early phases of new coinage there would be winners and losers. Decimal fractions did not always equal vulgar fractions and so there would have to be some rounding up or rounding down. However, if coins were of sufficiently low denomination, the differences would be infinitesimal. Moreover, Jefferson believed that the architects of the new money should look to long-term convenience. Short-term hiccups in the conversion process were, in his view, a small price to pay.<sup>14</sup>

Jefferson's formulations on coinage were eventually accepted by Congress. In May 1785 it reported favourably on the dollar as a unit of account and agreed that "All accomptants must prefer Decimals." On 6 July it resolved that the money unit of the US would be a dollar and that coins "shall increase in a decimal ratio." It fixed the weight of fine silver in the dollar and the ratio of silver to alloy at 11 to 1. It also authorized the establishment of a national mint. Although some delegates preferred versions of the Morris proposals, there was broad agreement that there should be a national coinage understood by everybody. While state currency had preserved a vital facet of state sovereignty, the effects were muddled at best and corrosive at worst.<sup>15</sup>

<sup>13</sup> Notes on Coinage, March to May 1784; Jefferson to Francis Hopkinson, 3 May 1784, Julian P. Boyd et al., ed., *The Papers of Thomas Jefferson*, (Princeton, 1953), 7, 175–85.

<sup>14</sup> Robert Morris to Jefferson, 1 May 1784; Notes for Reply to Robert Morris, 7–9 May 1784, *The Papers of Thomas Jefferson*, 7, 189–94.

<sup>15</sup> Propositions Respecting Coinage, May 1785, *Journals of the Continental Congress, 1774–1789*, (Washington D. C., 1904–37), 28, 354–55; Board of Treasury to Continental Congress, 8 Apr. 1786; Proposal 1, *Journals of the Continental Congress*, 30, 162, 166–68; Nathaniel Gorham to James Bowdoin, 18 May 1786; Timothy Bloodworth to Richard Caswell, 16 Aug. 1786, in Paul H. Smith et al., eds., *Letters of Delegates to Congress, 1784–1789*. 25 vols., (Washington, D. C., 1976–98), 23, 295–96, 475; Nathan Deane's Address to the Massachusetts House of Representatives, 9 November 1786, *ibid.*, 24, 18.

Events overtook plans to establish a mint under the Articles of Confederation. The Philadelphia convention and the ensuing federal constitution barred the states from issuing their own money and gave the federal government the sole right to mint. There were no objections to what amounted to a grant of monopoly for coinage – the provision was unanimously accepted by the delegates. However, no restrictions were placed on private bank issues, which would come under state regulation. The newly formed federal government was convinced that a single, manageable currency was a *sine qua non* of viable nationality. Most contemporaries agreed that the money supply had to be brought under control and that different monies should not compete with one another. An article in the Philadelphia *Independent Gazetteer* addressed to the “Real Patriots of America” affirmed that “in modern times, *money* does everything. If a government can command this unum necessarium from a certain revenue, it may be considered as wealthy and respectable; if not, it will lose its dignity and become inefficient and contemptible.”<sup>16</sup> In the ratification debate in Pennsylvania Thomas McKean embraced the idea of a uniform currency as it would allow Americans to “know the extent and operation of our contracts, in what manner we are to pay, or to be paid ... and the traveller will not be embarrassed with the different estimates of the same coin in the different districts through which he passes.”<sup>17</sup> In similar vein Hamilton wrote in *Federalist 30*: “Money is, with propriety, considered as the vital principle of the body politic; as that which sustains its life and motion, and enables it to perform its most essential functions. A complete power therefore to procure a regular and adequate supply of it ... may be regarded as an indispensable ingredient in every constitution.”<sup>18</sup>

A stable and easily negotiable money supply was the vital ingredient of a healthy economy. Contemporary discussions of the vital elements of national wealth often alluded to the integral role of stable money. Even though America’s abundance of natural resources featured as its greatest

<sup>16</sup> See Max Farrand, ed., *The Records of the Federal Convention of 1787*. 4 vols., (New Haven, 1966 edn.), 2, 308, 3, 117–18. Alfred to the Real Patriots of America, 13 Dec. 1787, in *Documentary History of the Ratification of the Constitution, 14: Commentaries on the Constitution, Public and Private* (Madison, 1993), 433; Bray Hammond, *Banks and Politics in America: From the Revolution to the Civil War* (Princeton, 1957), 91–94.

<sup>17</sup> Thomas McKean in *Documentary History of the Ratification of the Constitution: II, Pennsylvania* (Madison, 1976), 415.

<sup>18</sup> Alexander Hamilton, James Madison and John Jay, *The Federalist Papers*, ed. Clinton Rossiter (New York, 1961), 188; also, Gerald Stourzh, *Alexander Hamilton and the Idea of a Republican Government* (Stanford, 1970); Sidney Homer and Richard Sylla, *A History of Interest Rates* (Brunswick, New Jersey, 1996), 283.

prize, commentators recognized that a sound financial framework was the key to the efficient exploitation of those resources. “A Citizen of New York” advised a substantial reduction of America’s exposure to foreign currency by encouraging domestic trade. While “trade is the road to, and fountain of riches,” he wrote, Americans could only achieve national greatness if they avoided the propensity to bring “on ourselves debts, difficulties and perplexities.” “An American,” in a long pamphlet, *The True Interest of the United States*, agreed that “a civilized nation, without commerce, is a solecism in politics. It is the rudest state of mankind only.” Barter and exchange were intrinsic to the nature of man. Sophisticated societies eased the bartering process by introducing universally understood common standards. Nations had adopted “a scale or standard for measuring the value of every species of property; thereby to ascertain the relative worth of every commodity, compared with others, and with this common standard.” In common with economists such as Sir James Steuart, author of *Principles of Political Oeconomy*, published in 1767, the “American” argued that the real wealth of a nation lay in the volume of trade and the velocity of money that negotiated that trade. Money supply had to be plentiful enough and reliable enough to encourage a selling culture. The art of statecraft was to gauge the quantity of money thus needed.<sup>19</sup>

To function properly the new nation would have to increase production, break down trade barriers and become a single market for home-produced goods. The architects of the Constitution encouraged the national market through the provisos on Congress’s power to tax and regulate interstate commerce. Alexander Hamilton hoped to expedite the opportunities afforded under the Constitution by putting certain financial arrangements into place. His proposals to establish a national bank, encourage domestic manufactures and create an efficient federal bond market were an integral part of the vision. They were all designed to create a working capital market. The single currency, emitted through a national mint, would serve as the indispensable lubricant of these other measures and as a dispassionate thermometer of economic progress.<sup>20</sup>

<sup>19</sup> A Citizen of New York, *The Commercial Conduct of the United States of America Considered and the True Interest Thereof* (New York, 1786), 5–6, 10; An American, *The True Interest of the United States, and Particularly of Pennsylvania, Considered; With Respect to the Advantages Resulting from a State Paper-Money* (Philadelphia, 1786), 1–2.

<sup>20</sup> Alexander Hamilton, “Report on Manufactures, December 5, 1791” in Jacob E. Cooke, ed., *The Reports of Alexander Hamilton* (New York, 1964), 115–205; Tench Coxe, *A View of the United States of America, in a Series of Papers, Written at Various*

Hamilton's Report on the Establishment of a Mint, communicated to Congress in January 1791, was a painstakingly and convincingly argued plan to resolve the confusion of America's currency system. In combination with his other economic proposals, it sought to consolidate the authority of the new nation by easing out other forms of legal tender that undermined affiliation with the national state. The diverse coinage and bills of credit that circulated earlier had served to confirm the political boundaries of the states. Hamilton understood this. Changes in monetary instruments entailed shifts in thinking about a national boundary. Although much of the Report was technical, addressing such issues as the valuation ratio of gold and silver, the proportion of alloy in coin, and the cost of striking, its main aim was to complete the withdrawal of state bills, retire foreign coins and replace them with a national system of money with a single unit of account, the dollar. Like Jefferson, Hamilton was mindful of the fact that the transition to a single currency might be confusing in the first stages. He was confident that this preliminary uncertainty would be counterbalanced by the convenience and ease of calculating in decimals.

Hamilton was aware that the switch to a national and uniform currency did not arouse local jealousies in the way that his proposals for the funding and assumption of state debts had done. He reminded Congress that the nationalizing reverberations of a single currency had been understood and even embraced during the Confederation. He pointed out that differences and fluctuations in the value of money adversely affected "the essential interests of trade and industry [and] the value of all property." For Hamilton, the establishment of a national mint and a common currency served to stabilize the political order and encourage a robust exchange economy. Under his plan a dollar, defined in terms of its gold and silver content, would have the same value throughout the union. He stated:

The unequal values allowed in different parts of the Union to coins of the same intrinsic worth; the defective species of them, which embarrass the circulation of some of the States; and the dissimilarity in their several Monies of account, are inconveniences, which if not to be ascribed to the want of a National Coinage, will at least be most effectually remedied by the establishment of one.<sup>21</sup>

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*Times, between the Years 1787 and 1794* (Philadelphia, 1794), 290–302; Perkins, *American Public Finance and Financial Services*, 210–21.

<sup>21</sup> "Final Version of the Report on the Establishment of a Mint," 28 January 1791, Harold C. Syrett and Jacob E. Cooke, eds., *The Papers of Alexander Hamilton*, 26 vols., (New York and London, 1961–79), 7, 571. The legal tender status of foreign coins was not cancelled until 1857.



It is important to note that Hamilton's proposals met with little opposition. After all, Hamilton had based his ideas on Jefferson's earlier recommendations. The debates in both the House of Representatives and the Senate were short. There were divisions, but these centred on the designs of the gold and silver coins. Federalists wanted to see a portrayal of President Washington on the reverse of the coins to emphasize political authority. Republicans in the House of Representatives argued for a motif that emphasized the union of separate states and an image of the Goddess of Liberty. The debates reflected the larger national divisions over the power of the executive and the meaning of federal authority. Members of Congress had seen engravers' designs, commissioned by Robert Morris, head of the Senate committee on coinage. Republicans recoiled against designs that glorified any individual and urged a motif that confirmed that the new nation was a union of states. George Washington, mindful of Republican sensitivity, let it be known that he considered prototypes with a presidential head as too monarchical. The arguments in Congress, it must be emphasized, revolved around the symbols and meaning of national authority. They were not about the wisdom of a national currency *per se*. They were about the source of that nationality.<sup>22</sup>

Washington signed the bill in April 1792, and the Mint of the United States was formally established. Thomas Jefferson, now Secretary of State, hailed the removal of monetary uncertainty and saw the new coinage as a first step towards his grand design for an integrated system of measurement. The decimalization of coinage, Jefferson believed, should clear the way for the decimalization of weights and measures.<sup>23</sup> While Hamilton saw the attractions of an integrated system, he was essentially a pragmatist who wanted to get the system off the ground as quickly as possible so that it would tie in with other aspects of his financial programme. For Hamilton a single currency was a means of consolidating the credit of the United States and assuring the merchant class that money would be circulated easily and with confidence. For Jefferson it was

<sup>22</sup> *Journal of the Senate of the United States of America, Being the First Session of the Second Congress* (Philadelphia, 1791), 65, 73, 93; *Journal of the House of Representatives of the United States of America, at the First Session of the Second Congress* (Philadelphia, 1792), 148–50. Various web pages are useful for descriptions of the various designs of coins. See <http://www.coins.nd.edu/ColCoin/ColCoinContents/Contents11.html> and ... [ColcoinIntros/WashGETZ.intro.htm](#).

<sup>23</sup> Jefferson to Hamilton, 24 Jan. 1791, *Papers of Alexander Hamilton*, 7, 451; Jefferson to John Rutherford, 25 Dec. 1792, in John Catanzariti ed., *The Papers of Thomas Jefferson*, (Princeton, 1990), 24, 782; Hellman, "Jefferson's Efforts towards the Decimalization of United States Weights and Measures," 296.

something more. A single currency would underscore the uniqueness of the new nation and reinforce its versatility in promoting new ways of thinking. He understood that an adherence to old measures of money and weight smacked of support for old lines of political authority. In Europe and especially in pre-Revolutionary France, the control of weights and measures had formed part of seigniorial privilege. The imposition of new standards of measurement from a single authority thus undercut old, local allegiances and enabled a commercial nation to compare prices in an ordered and rational way.<sup>24</sup>

According to Jefferson, the establishment and enforcement of uniform currency and measures were crucial ingredients of nationality. He believed that mathematical symmetry enabled the common man to calculate across a range of activities, thus easing his entry into the commercial marketplace. It was also a tool for enabling governments to calibrate the efficacy and efficiency of that marketplace. Numbers and the statistics that flowed from them were regarded as objective measures of social and economic progress. Secretary Jefferson thus recommended a thorough reformation of the whole system of weights and measures, by reducing them to the same decimal ratios that had been established in American coins. Gouverneur Morris agreed that a total restructuring of measures would help consolidate the new union. The standardization of “Weights Measures and Money,” he wrote, “on an easy and uniform Plan is an Object of very great Importance to America. Much more so than to most Countries. Every Man is called by our Constitution to share in the Government. A knowledge of Statics is therefore in some Measure necessary to every great American Citizen, and the obtaining of this Knowledge will be greatly facilitated by the Establishment of a Currency.”<sup>25</sup>

Jefferson’s zealous proselytizing of the decimal system reflected the growing enthusiasm for decimalization throughout the American academy. A number of mathematical texts were produced in the years following the formation of the federal government. They were usually either arithmetical reference works, in the form of ready reckoners, or school texts that sought to make pupils more familiar with decimal counting and the new federal standards in money. The authors of these

<sup>24</sup> Witold Kula, *Measures and Men* (Princeton, 1986), 115, 192, 210–35.

<sup>25</sup> Morris to Jefferson, 7 Nov. 1791, in Charles T. Cullen, ed., *The Papers of Thomas Jefferson*, (Princeton, 1986), 22, 265; Patricia Cline Cohen, “Statistics and the State: Changing Social Thought and the Emergence of a Quantitative Mentality in America, 1790–1820,” *William and Mary Quarterly*, 3rd Series, 38 (Jan. 1981), 36–41.

texts recognized that the switch to decimal currency required a parallel switch in mathematical mind sets. For generations Americans had billed and paid each other in pounds, shillings and pence. They were now required to change. This not only required mathematical skills in order to understand the financial equivalencies, but also a mental restructuring in the area of numbers. If adults were slow to change their ways, these mathematical writers reasoned, their children might strike out and ease the passage to decimalization and even metrication.

The crusade for decimalization had begun in Europe in the late sixteenth century. Simon Stevin (or Stevinus), a Dutch mathematician, established a scale to convert all fractions to decimals in 1585. His decimal notations were awkwardly superscripted and were later modified by a number of other Dutch and French mathematicians. The most important breakthrough was made by John Napier (1550–1617), the inventor of logarithms, who incorporated the point to designate decimals.<sup>26</sup> In 1699, E. Hatton published in London his *Decimals Made Easie*, a book which extolled decimals for their mathematical ease and accuracy. Since all decimals had common denominators (in multiples of ten), there was no need to specify them. Instead the decimal point contained all the necessary information. Addition, subtraction, multiplication and division were subject to the same rules as whole numbers. They were also more accurate as the movement of the decimal point to the right of a number permitted a high degree of finessing. “It is impossible there should ever be any kind of fraction invented so excellent as Decimal; because no other Fraction can be expressed without the Denominators, and wrought as though they were integers.”<sup>27</sup> Benjamin Martin’s *A New Compleat and Universal System or Body of Decimal Arithmetick* (1763) carried the same message. It commended “the Excellency and superior Usefulness of Decimal Arithmetick, above all other kinds of Computation.”<sup>28</sup>

While decimals were, to use modern parlance, more “user friendly,” they did present certain disadvantages. It was those disadvantages which explain in part the persistence of accounts in pounds, shillings and pence until well into the nineteenth century. Mathematical tidiness is not necessarily the basis on which men and women count. Man’s earliest method of counting was anthropomorphic, in which the most important

<sup>26</sup> Ronald Edward Zupko, *Revolution in Measurement: Western European Weights and Measures since the Age of Science* (Philadelphia, 1990), 120–23.

<sup>27</sup> E. Hatton, *Decimals Made Easie: Containing an Explanation of Fractions in General, More Especially Decimals, and how to Read or Write any Fraction Whatsoever* (London, 1699), 43.

<sup>28</sup> Benjamin Martin, *A New Compleat and Universal System or Body of Decimal Arithmetick* (London, 1763), 3.

measures correspond to parts of the human body. The base of ten corresponded to the digits on hands and feet, and fingers have always been used to help count. Even in biblical texts, groupings of numbers tend to be in tens and scores. But decimal progression did not always apply to division. The splitting of whole numbers, which is also an integral part of the computing process, is occasioned by the need to apportion scarcity. Decimals do not correspond with the simplest measures of division. Halves, quarters and eighths are more instantly recognizable and appear in most early numerate cultures. It is the transcendence of such fractions that may have contributed to the delay in switching to a decimal basis of counting. Moreover, Americans, in common with Europeans, still tended to quantify goods in dozens, since twelve divided conveniently by two, three, four and six.<sup>29</sup>

While the English currency did not correspond to perfect fractions, it possessed a numbering pattern with which Americans had long been familiar. The advocates of decimal currency needed to convince Americans that their alternative system was indeed more manageable and that it would assist monetary standardization. Conversion to the new scheme would also, they insisted, energize the commercial world. If financial calculations were less complicated, then the marketplace would be more accessible and efficient. In turn, if commercial arithmetic were easier, it might even serve to demystify arithmetical processes for the less numerate. Patricia Cohen has demonstrated that numeracy was highly restricted in the eighteenth century. Mathematics, she has observed, generally “remained an arcane and difficult subject.” The popularity of ready reckoners testified to the reluctance of businessmen to make their own calculations from first principle. Mathematical learning was rare and preoccupation with measurement – and again Jefferson is the best example – was confined to an elite. The advocates of reform in the numbering system believed that the spread of numeracy would make a people more aware of their economic and political surroundings. In Cohen’s words: “Quantification ... counts – and accounts in the process; it describes stationary objects and changing relationships; it uncovers patterns, evaluates risks, and predicts outcomes. Quantification can be a

<sup>29</sup> See H. Arthur Klein, *The World of Measurements* (London, 1975), 97–115; Zupko, *Revolution in Measurement*, 24–31, 103–08, 122–39; Ronald Edward Zupko, *British Weights and Measures: A History from Antiquity to the Seventeenth Century* (Madison, 1977), 94–96; W. M. Feldman, *Rabbinical Mathematics and Astronomy* (New York, 1978 edn.); Sir John Bowring, *The Decimal System in Numbers, Coins, and Accounts: Especially with Reference to the Decimalisation of the Currency and Accountancy of the United Kingdom* (London, 1872), 1–34.

powerful method of analysis and a powerful explanatory tool.”<sup>30</sup> The understanding of numbers thus made for a safer commerce and also elevated the learning of a citizenry. The propagandists for the new currency argued that the abandonment of complex pounds, shillings, pence and farthings and its replacement with decimal dollars, cents and milles would ease commercial transactions, make the parties to those transactions more confident, and reinforce a republican society through its informed citizenry. One of the most forceful arguments came from Erastus Root who, in *An Introduction to Arithmetic for the Common Schools*, first published in 1795, and reprinted in 1802, argued for the connection between decimal money and republican government. He believed that America’s innovative political arrangements equipped it to pioneer decimal arithmetic in coinage, weights and measures. “The simplicity of this alone, of this our Federal money, is its sufficient recommendation .... Almost two centuries have elapsed since the invention of Decimal Arithmetic; yet never, till lately, has it been applied to the weights, measures or monies of any nation. But it remained for the United States to make the beginning. Here, too, the Tree of Liberty first put forth its blossom.” Decimal money, he insisted, not only made mathematical sense but served America’s rejection of colonial ways and affirmed its leadership in democratic government. America had rejected the corrosive “counter-worm of feudal Gothicism” exhibited in Britain’s monetary system. Root reiterated the idea that mathematical and political systems were closely correlated. Britain’s “intricate mode of reckoning ... is suited to the genius of their government, “he contended, “for it seems to be the policy of tyrants, to keep their accounts in as intricate, and perplexing a method as possible.” British monetary denomination was deliberately difficult. By contrast “Republican money ought to be simple, and adapted to the meanest capacity.”<sup>31</sup>

After the establishment of federal money in 1792, mathematical texts generally included exercises in compound arithmetic that invariably involved calculations about money, or “mercantile arithmetic.” Authors usually praised the simplicity of decimal figures and counselled pupils that calculations would always be easier if numbers were set out properly in column form. J. B. Bordley, writing in 1789, some three years before the passage of the Coinage Act, marvelled: “The division of monies of

<sup>30</sup> Patricia Cline Cohen, *A Calculating People: The Spread of Numeracy in Early America* (Chicago and London, 1982), 44, 85–86, 127.

<sup>31</sup> Erastus Root, *An Introduction to Arithmetic for the Common Schools* (Boston, 1802); Cohen, *A Calculating People*, 129.

account and coin into tenths is wonderfully convenient ... . How easy to multiply or divide 16849 cents by dots!” The decimal method, he continued, “gives the quickest, most certain, and easy way of reduction, both for the learned and unlearned.” He was aware that “simple people” might object to the change, “but there can be no doubt, the new terms and divisions into tens will presently become familiar.”<sup>32</sup>

Most exercises in mathematical textbooks involved converting one currency into another. Thomas Dilworth in *The Schoolmaster's Assistant* (1784) justified this concentration on exchange rates by pointing out that price comparisons were the essence of a successful commercial society. Pupils, he wrote, needed to know “in a more particular manner, the Necessity of knowing how to turn the Money of one Country with the Money of another Country, value for value.”<sup>33</sup> In 1793 Thomas Sarjeant, author of the first text to “apply the Science of Arithmetic to the Money of Account of the United States of America,” hoped to make business more effective with his mathematical exercises. Simplicity was the crux of the new system. He began with layout. Sarjeant pointed out that there was no established convention for the notation of the new money. Dollars, dimes, cents and milles were often recorded by separation with dots or lines. Thus 15 dollars, 6 dimes, 4 cents and 2 milles could be written:

Dolls d c m OR Dolls d c m  
 15 . . 6 . . 4 . . 2            15    |6 |4 |2

Sargeant celebrated the decimal and advised that the neatest way of expressing the sum was 15.642 dollars.<sup>34</sup>

Authors of arithmetic books and ready reckoners recognized that mathematical transitions are not easily undertaken by the populace. Methods and units of calculation evolve over the years and tend to reflect methodologies learned in childhood. Thus Samuel Sower, author of *The Federal or New Ready Reckoner* (1793), praised the decision to create a

<sup>32</sup> J. B. Bordley, *On the Monies, Coins, Weights and Measurers Proposed for the United States of America* (Philadelphia, 1789), 1–4.

<sup>33</sup> Daniel Fenning, *The American Youth's Instructor, or a New and Easy Guide to Practical Arithmetic ...* (Dover, NH, 1795); Benjamin Workman, *The American Accountant or Schoolmaster's New Assistant* (Philadelphia, 1796); Thomas Dilworth, *The Schoolmaster's Assistant: Being a Compendium of Arithmetic both Practical and Theoretical* (Philadelphia, 1784).

<sup>34</sup> Thomas Sarjeant, *The Federal Arithmetician, or the Science of Numbers Improved* (Philadelphia, 1793), 83–86. The dollar sign as we know it (\$) was not yet in use. See Eric P. Newman, *The Dollar Sign: Its Written and Printed Origins* (New York, 1995). J. B. Bordley recognized early on the confusion that would arise in not having a consistent sign for the dollar. See J. B. Bordley, *A Supplement to the Essay on Monies, Coins & c. Proposed for the United States of America* (Philadelphia, 1790).



uniform currency throughout the United States saying “it may be justly said, that there is not a better regulated money in the Universe.” But he also appreciated that habits die hard and anticipated that Americans would continue to think in terms of familiar currencies. As long as people stuck to the old denominations, there would be a need to produce conversion tables in ready reckoners and mathematical exercises to enable the population to compare value properly. Erastus Root agreed and so justified his inclusion of old monies in his text on decimal money. “I have given many of the examples in Pounds, Shillings, & Pence, supposing it necessary to instruct our youth in the *old way*, for some time yet to come. The customs of a great nation cannot be wholly changed in a month, nor a year.”<sup>35</sup>

Root’s observation was prescient. Even though the United States had adopted the decimal dollar as its sole money, Americans continued to think and trade in the old sterling-based currencies. The persistence of old money was not just the consequence of man’s difficulty in adjusting to new systems of money and counting. It was reinforced by the provision of ready reckoners and other conversion tables that took away the incentive to reorientate to a new system of counting.

The Coinage Act of 1792 provided that all federal accounts were to be kept in the new currency. The provisions did not compel the states or individuals to follow suit. Indeed, private financial transactions continued to be conducted in a mixture of US dollars and the pounds, shillings and pence of the various states. Surprisingly, the two parallel systems lasted for about a generation. It was only in the late 1820s that transactions in pounds, shillings and pence became virtually extinct. Thus at least one of the fundamental ideas behind the single currency – the enabling of simple price comparisons – did not hold. It appears that many Americans not only coped with the dual system but preferred it. A few examples illustrate the coexistence of the two currencies. In Pennsylvania traders in arts and crafts throughout the 1790s advertised their wares in dollars and pounds. Engravers tended to offer their portraits and landscapes priced in dollars. J. J. Boudier offered portraits using a “Physiognotrace” at 2 dollars each in December 1796, although a miniature painter offered his portrait services at 5 pounds each. Individuals clearly thought interchangeably. In March 1794 Joseph Cooke, a goldsmith, advertised for journeymen with a pay of 9s a day, and in the same advertisement offered a bonus of “a pair

<sup>35</sup> Samuel Sower, *The Federal or New Ready Reckoner, and Traders Useful Assistant; in Buying and Selling Commodities, either Wholesale or Retail Adapted to the Federal Money* (Philadelphia, 1793); Root, *An Introduction to Arithmetic for the Common Schools*.

of silver shoe buckles worth 8 dollars.”<sup>36</sup> Similarly, rewards in Pennsylvania offered for the return and recovery of runaway apprentices or lost animals were sometimes in pounds, sometimes in dollars, although, by the turn of the nineteenth century, pounds were rarer. Land prices and rents tended to be quoted in pounds, but this is explained by the fact that tax and lease assessments predated the formation of the republic.<sup>37</sup> An advertisement in the *Aurora General Advertiser* on 23 February 1795 offered a 4 dollar reward for the return of a lost black pocket book that contained five bank notes, “3 of three dollars of the Bank of the United States, 2 of five dollars of the Bank of Pennsylvania and an account of £7 16 3 payable to Alexander Stockburn.”<sup>38</sup>

Mixed denominations obfuscated financial comparisons, particularly in assessing the performances of state treasuries. In December 1791 the Governor of Pennsylvania, in an address to the general assembly, directly referred to the cumbersome effect of a dual monetary system. He believed that financial reforms in the state would not be transparent unless the monies of account were properly standardized. “I am prompted by a desire,” he told assemblymen, “of preserving uniformity in pecuniary transactions and statements, as well as by the greater conveniency of the method, which has been adopted at the treasury of the union, and at the several banks, to recommend that the legislature should prescribe a period, after which all accounts between the state and her officers, shall be kept in dollars and cents.”<sup>39</sup>

Although the accounts of Pennsylvania and other states were standardized shortly after the adoption of the federal dollar, private accounts continued to be kept in mixed format as some people paid in pounds and some in dollars. Even Thomas Jefferson, the most prominent proponent of the single decimal currency, continued to be billed in Virginia pounds and had to convert invoices into decimal dollars. Throughout the 1790s and early 1800s, Jefferson amended his detailed personal account books in order to provide uniformity in his book-keeping. It must have been confusing. In 1803 he was sent an account for groceries for £268.23 1/2 which he converted to 739.11 dollars. Five days later he received another account from the same person, this time in

<sup>36</sup> Alfred Coxe Prime, ed., *The Arts and Crafts in Philadelphia, Maryland and South Carolina, 1786–1800* (Philadelphia, 1932), 3, 67, 103.

<sup>37</sup> *Aurora General Advertiser*, 12 Jan., 3 Sept. 1795; *Pennsylvania Gazette*, 29 Feb., 4 July 1792.

<sup>38</sup> *Aurora General Advertiser*, 23 Feb. 1795.

<sup>39</sup> *Pennsylvania Gazette*, 14 Dec. 1791.

straight dollars. In 1809 he billed David Higginbotham on several occasions, sometimes in dollars and sometimes in pounds.<sup>40</sup>

While Jefferson converted pounds to dollars, many merchants converted dollars to pounds. The reasons were manifold: habit, the shortage of federal coins to reinforce the new money, the continuing use of silver foreign coins, the wide circulation of almanacs and conversion tables, and the continuing mathematical exercises in pounds. While everyday transactions requiring immediate payment were conducted in dollars, either in coin, banknotes or credit notes (serving as cheques), book-keeping was frequently done in local pounds. Thus a good knowledge of conversion rates was vital to the exchange process. An anonymously published handbook, *The Intercourse of Nations*, admitted that “It is not a little extraordinary, that this [federal] currency which is of all others the least intricate and the easiest calculated, is also the least understood and the seldomest practised.”<sup>41</sup> The most convenient conversion tables were printed in almanacs. The almanacs were generally pocket sized, designed to be carried around. While owners used their almanacs for different purposes, it is likely that the conversion tables would have been one of the more frequently used snippets of information. An early nineteenth-century wallet, found about one hundred years later, contained a manuscript list of the values of Pennsylvania currency to federal money.<sup>42</sup>

Almost all the popular almanacs published conversion tables. Most of these tables converted state currencies into Spanish dollars and, occasionally, pounds sterling. Several carried exchange rates against other silver coins such as the johannes, moidore, doubloon, Spanish pistole and the English guinea. *Webster's Calendar* for 1795 carried both tables and rules for converting the dollar currencies of one state to any other state. *Isaiah Thomas's Massachusetts, Connecticut, Rhode-Island, New Hampshire and Vermont Almanack* for 1798 included a “Table shewing the Value of any number of Cents from one to one hundred, in shillings, pence and farthings ... rendering the Value of the Federal Currency easy and intelligible” for that group of states in which one dollar was worth six

<sup>40</sup> James A. Bear Jr. and Lucia C. Stanton, eds., *Jefferson's Memorandum Books: Accounts with Legal Records and Miscellany, 1767–1826*, (Princeton, 1997), 2865, 1268.

<sup>41</sup> *The Intercourse of Nations: Being a Collection of Short & Easy Rules for Reducing Thirteen Different Coins and Currencies to Each Other, with a Concise Method of Calculating Federal Money* (New York, 1795), 123; see also various receipts and cashiers' orders in Pawnbrokers' Tickets, Bank Notes, Cancelled Cheques etc., Box 12A, Miscellaneous Collection, Historical Society of Pennsylvania, Philadelphia.

<sup>42</sup> Notes and Queries, *Pennsylvania Magazine of History and Biography*, 33 (1908), 250.

shillings.<sup>43</sup> The almanacs also published tables for working out interest rates, again in pounds, shillings and pence.<sup>44</sup>

The regular publication of conversion tables in all the major almanacs suggests that bargains were still struck in old currency. Commerce in pounds endured because of the shortage of American coin and because the population could not adjust to dollars and cents and so needed to reconvert to make their own price comparisons. The tables were a regular feature in the almanacs until around 1820. *The American Ladies Pocket Book* carried detailed exchange rates and, for those who liked a mathematical challenge, the usual complex formulae for converting one state money of account into another. *Poulson's Town and Country Almanac*, published in Philadelphia, featured tables in each issue. In 1809 it became *Bioren's Town and Country Almanack* and continued to present tables until 1819.<sup>45</sup> Similarly, *Poor Will's Almanack*, which had been published annually since independence, ceased to reproduce tables in the same year, 1820.<sup>46</sup>

By the mid 1820s the general availability of published tables had declined. Yet computation in old currency lingered. In 1839 Professor George Tucker of the University of Virginia commented:

Though the money of account adopted by the government, and used by most business, consists of dollars and cents, so as to conform to the actual coins as well as the decimal system, yet the former money of account, of pounds, shillings, and pence, is not yet laid aside, but, in almost all the states, still obtains the ascendancy in popular use.

While Tucker probably exaggerated the extent of usage in the old English denominations, he explained the phenomenon by reference to the persistence of habit. But he also understood the residual discomfort with decimals. While he believed decimal usage was “a great convenience, as it contributes to ease, simplicity and despatch,” he acknowledged that it did not conform to the divisions employed in many other calculations.

<sup>43</sup> *Webster's Calendar or, the Albany Almanack for the Year of our Lord 1795* (Albany, 1794); *Isaiah Thomas's Massachusetts, Connecticut, Rhode-Island, New Hampshire and Vermont Almanack with an Ephemeris for the Year of our Lord 1798* (Worcester, Mass., 1797).

<sup>44</sup> See, e.g., *Johnson's Pennsylvania and New-Jersey Almanack, 1805* (Philadelphia, 1804); *Low's An Astronomical Diary and Almanack for the Christian Aera 1802* (Boston, 1801).

<sup>45</sup> *The American Ladies Pocket Book for the Year 1800* (Philadelphia, 1799); *Poulson's Town and Country Almanac for the Year of our Lord, 1794* (Philadelphia, 1793) and the almanacs for subsequent years; *Bioren's Town and Country Almanack (formerly Published by Mr. Zachariah Poulson) for the Year of Our Lord 1809* (Philadelphia, 1808) and the almanacs for subsequent years; *Bioren's Town and Country Almanack for the Year of our Lord, 1820* (Philadelphia, 1819). *Bioren's Pennsylvania Pocket Remembrancer* ceased to publish conversion tables in 1814. *Bioren's Pennsylvania Pocket Remembrancer for the Year 1814* (Philadelphia, 1813).

<sup>46</sup> *Poor Will's Almanack for the Year of our Lord, 1820* (Philadelphia, 1819).

People still thought in halves, thirds and quarters and were generally more comfortable with fractions. While pounds, shillings and pence were no more suited to fractions than dollars, Americans were loath to “lay aside the divisions to which they have been accustomed, and their preference for which ... seems to have a foundation in nature.”<sup>47</sup>

One other reason for the persistence of old currency in book-keeping was the scarcity of coin in the United States. Most circulating money consisted of notes, denominated in dollars and issued by private banks. These banknotes were essentially surrogates for money and owed their value to their convertibility into specie. By law, they were redeemable on demand, but redemption was frequently avoided. Notes were not acceptable for all public debts. Strictly speaking, the gold, silver and copper coins issued by the federal government, together with selected foreign specie, were the only legal tender. However, they were in very short supply, particularly as their high quality resulted in hoarding or exportation. In the first three years of the mint's existence only \$453,511 was issued in gold, silver and copper coin. In the decade 1796–1806 the mint issued on average about \$418,000 a year, ranging from \$125,000 in 1797 to \$646,000 in 1799. It was only in the middle of the 1820s that it regularly issued coins worth over a million dollars, rising to a high of seven million dollars in 1834.<sup>48</sup> Since highly regarded federal coins were scarce, it is conceivable that some Americans clung to the old denominations because the nomenclature enjoyed a certain stature – pounds sterling continued to dominate accounting procedures in international trade. But if habit is not synchronized with official practice, it can only linger for so long. As the older generation died out and the children who had been taught decimals in school grew up, the decimal dollar became the nationwide unit of account.

<sup>47</sup> George Tucker, *The Theory of Money and Banks Investigated* (Boston, 1839), 63, 66. A British compendium of international currencies, weights and measures published in 1816 stated categorically, although not accurately, that in the USA “Accounts are kept the same as in England: in Pounds, Shillings and Pence.” See *The Merchant and Ship-Master's Assistant: Or an Account of the Monies, Weights and Measures of the Principal Commercial Places of Europe, America, East and West Indies* (North Shields, 1816), 76; also, Francis J. Grund, *The Merchant's Assistant or Mercantile Instructor Containing a Full Account of the Monies, Coins, Weights and Measures of the Principal Trading Nations and their Colonies; Together with their Values in United States Currency, Weights and Measures* (Boston, 1834).

<sup>48</sup> Montroville Wilson Dickeson, *The American Numismatological Manual of the Currency or Money of the Aborigines, and Colonial, State and United States Coins* (Philadelphia, 1859), 247; Nussbaum, *A History of the Dollar*, 61–63.

Despite the hesitancy with which Americans adopted the dollar in their book-keeping, the single currency issued by the mint achieved its objectives. Most important, it served to confirm the national authority of the new federal government. States were forbidden to coin their own money or issue bills of credit and so were stripped of a vital element of economic jurisdiction. These constitutional restrictions were broadly accepted. After the financial uncertainties of the confederation period, nationalists and federalists agreed that money had to be national in provenance. Once they had cleared the air on the design of the new coinage in 1792 they did not return to any debate about the propriety of national symbols on coins. Leaders on both sides of the political fence recognized that national legitimacy had to be won to ensure the health of the new federal union. Their greatest achievement lay in their ability to convince each other that they did not have to make a stark choice between central and state authority. The two could remain parallel as long as basic adhesives were found that would bind different interests. The launch of a new, common, and negotiable currency money was fundamental to flourishing nationhood. Despite the growth of state banks, sovereignty was to be undivided in the matter of the issue of legal tender.

The adoption of the dollar, with its decimal subdivisions, helped to identify the United States as a viable, independent nation capable of structuring both its finances and the arithmetic that supported it. Starting from scratch suited the young nation's circumstances. It was tidy. A single monetary standard symbolized the oneness of the new republic and its decimal basis served to confirm the United States as an innovator through its insistence on the link between calculation and political ideas. The pioneering spirit was to be found in the counting house as well as the meeting house. The proponents of decimal measurement believed that their new system was naturally suited to the unique political arrangements of the United States. They contended that it consolidated America's claim to be in the vanguard of progressive ideas. Although it avoided revolutionary France's root and branch changes to the measurement of weights, measures and time, the new nation injected a republican arithmetic into its republican political ideology. Of course, individual habits lingered. As recent experience of attempts at metrication in Britain and the United States has demonstrated, mathematical mind-sets can be obstinate. However, despite the residual clinging to English monetary denomination, the habit did not undermine the consolidation of nationality to which the single currency had been a pivotal handmaiden.